ATM SG/7-REPORT

INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SEVENTH MEETING OF THE MIDANPIRG ATM SUB-GROUP

ATM SG/7

(Virtual, 15 – 18 November 2021)

The views expressed in this Report should be taken as those of the MIDANPIRG ATM Sub-Group and not of the Organization. This Report will, however, be submitted to the MIDANPIRG and any formal action taken will be published in due course as a Supplement to the Report.

Approved by the Meeting
and published by authority of the Secretary General

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PART I - HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Seventh meeting of the MIDANPIRG ATM Sub-Group (ATM SG/7) was held virtually, from 15 to 18 November 2021, via MS Teams.

2. OPENING

2.1 The meeting was opened by Mr. Mohamed Smaoui, Acting Regional Director, Middle East Office, who welcomed all participants, and highlighted the importance of the subjects addressed under the ATM SG and its subsidiary bodies.

2.2 Mr. Smaoui recalled the Terms of Reference of the ATM SG, related to the review and enhancement of the MID Region ATS Route network, to meet users' demand, and the availability of different routing options and alternates, including the contingency routes, to support the international traffic flows. He also highlighted the priority of other implementation that supports the overall enroute traffic operations, including ATFM, CMC/FUA and RVSM implementation.

2.3 Furthermore, Mr. Smaoui highlighted the importance of the ANS performance monitoring and the agreed initial set of KPIs for the MID Region; and the required measurement at Regional level, that would be included in the Annual Air Navigation Report 2021.

2.4 Mr. Smaoui thanked all the participants for their attendance, and appreciated the efforts made by the States whom provided presentations and working papers on the developments at National level during the last period and on the plans for the coming years, in particular Bahrain, Egypt, Jordan, Oman, Qatar, Saudi Arabia, Sudan and UAE. He wished the meeting every success in its deliberations.

3. ATTENDANCE

3.1 The meeting was attended by a total of one hundred twenty six (126) participants from fifteen (15) States (Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE and Yemen) and five (5) Organizations (AACO, ACAO, EUROCONTROL, IATA, and MIDRMA). The list of participants is at **Attachment A**.

4. OFFICERS AND SECRETARIAT

4.1 The meeting was chaired by Mr. Khaled Ahmed Arabiyat, ATM Director, Civil Aviation Regulatory Commission (CARC), Jordan.

4.2 Mr. Ahmad Amireh, RO/ATM/SAR was the Secretary of the meeting, assisted by Mr. Ahmad Kavehfirouz, RO/ATM and Mr. Radhouan Aissaoui, RO/IM. Mr. Mohamed Smaoui, Acting Regional Director, supported also the meeting.

5. LANGUAGE

5.1 Discussions were conducted in English and documentation was issued in English.

6. AGENDA

6.1 The following Agenda was adopted:

Agenda Item 1: Adoption of the Provisional Agenda

Agenda Item 2: Follow-up on MIDANPIRG/18 Conclusions and Decisions relevant to ATM/SAR

Agenda Item 3: Planning and implementation issues related to ATM/SAR

- Updates from MID States on ATM/SAR Implementation
- ATS Route Network
- MID Doc. 003: MID Region ATM Contingency plans
- MID ATFM Implementations
- FWC2022 progress
- RVSM implementation and monitoring
- Other ATM issues (CMC/FUA, MID Doc 004: HLAC, OPSdataEX, etc.)
- SAR Implementation issues

Agenda Item 4: MID Air Navigation Strategy related to ATM

Agenda Item 5: Air Navigation Deficiencies in the ATM/SAR fields

Agenda Item 6: Future Work Programme

- Election of Chairpersons
- Dates and Venue of next meeting

Agenda Item 7: Any other Business

7. CONCLUSIONS AND DECISIONS – DEFINITION

7.1 The MIDANPIRG records its actions in the form of Conclusions and Decisions with the following significance:

a) **Conclusions** deal with matters that, according to the Group's terms of reference, merit directly the attention of States, or on which further action will be initiated by the Secretary in accordance with established procedures; and

b) **Decisions** relate solely to matters dealing with the internal working arrangements of the Group and its Sub-Groups.

8. LIST OF DRAFT CONCLUSIONS AND DECISIONS

DRAFT CONCLUSION 7/1: *PROPOSAL FOR AMENDMENT TO THE MID eANP VOLUME II, TABLE ATM II-MID-I: MID REGION ATS ROUTE NETWORK*

DRAFT DECISION 7/2:	*MID ATM CONTINGENCY PLANNING AD-HOC ACTION GROUP*
DRAFT CONCLUSION 7/3:	*MID ATFM IMPLEMENTATION PLAN (V2.0)*
DRAFT CONCLUSION 7/4:	*MID RVSM SAFETY MONITORING REPORT (SMR-2021)*
DRAFT DECISION 7/5:	*MID CMC/FUA ACTION GROUP*
DRAFT DECISION 7/6:	*TERMS OF REFERENCE OF THE ATFM TF*
DRAFT DECISION 7/7:	*TERMS OF REFERENCE OF THE FWC 2022 TF*

PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA

1.1 The meeting reviewed and adopted the Provisional Agenda as at paragraph 6 of the History of the Meeting.

REPORT ON AGENDA ITEM 2: FOLLOW-UP ON MIDANPIRG/18 CONCLUSIONS AND DECISIONS RELEVANT TO ATM/SAR

2.1 The meeting noted the status of the MIDANPIRG/18 Conclusions and Decisions and the follow-up actions taken by States, the Secretariat and other parties concerned as at **Appendix 2A**. The meeting agreed also to review the Conclusions and Decisions, which are still current, under the associated Agenda Items with a view to propose to MIDANPIRG/19 meeting appropriate follow-up actions.

REPORT ON AGENDA ITEM 3: PLANNING AND IMPLEMENTATION ISSUES RELATED TO ATM

MID ATS Route Network Table

3.1 The subject was addressed in WP/3 presented by the Secretariat.

3.2 The meeting recalled MIDANPIRG Conclusion 18/13 related to the Proposal for Amendment to the MID eANP Volume II, Table ATM II-MID-I: MID Region ATS Route Network.

3.3 The meeting noted that ICAO MID Office received inputs from the Airspace users and 12 States. Accordingly, the proposals and inputs, which were agreed by all (did not raise any objection) were consolidated in the revised version of the ATS Route Table.

3.4 The meeting noted that ICAO MID Office, in coordination with the concerned States, addressed the previously identified issues including the ATS route designators, duplication of 5LNCs, Removal of suffix "U", etc.

3.5 The meeting agreed on the use of designator "T" for the contingency routes in the MID Region to be included in the ANP, with the understanding that these routes are to be activated when needed by NOTAM in accordance with the MID Region ATM Contingency plan.

3.6 The meeting agreed that the draft PfA at **Appendix 3A**, be presented to MIDANPIRG/19 meeting (14 – 17 February 2022) for further endorsement before processing according to the standard PfA procedure.

3.7 Based on the above, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 7/1: PROPOSAL FOR AMENDMENT TO THE MID eANP VOLUME II, TABLE ATM II-MID-I: MID REGION ATS ROUTE NETWORK

That, the ICAO MID Office process the Draft Proposal for Amendment to the MID eANP Vol II, Table ATM II-MID-I, at ***Appendix 3A****, in accordance with standard PfA procedure.*

3.8 The meeting agreed that the pending issues/proposals still raising objection by some stakeholders, at **Appendix 3B**, need further coordination and prioritization by the ATS Route Development Working Group (RDWG) and ATM SG. . The meeting encouraged concerned States to take the necessary actions, in coordination with the ICAO MID Office and other concerned stakeholders to overcome the remaining challenges.

3.9 The meeting reiterated that the MID RDWG/Route catalogue is the main platform to address further ATS Route network improvements.

3.10 The urged States to take necessary actions for the elimination of the duplicate 5LNCs at **Appendix 3C.**

Route Catalogue

3.11 The subject was addressed in WP/21, presented by IATA.

3.12 The meeting recalled that the MIDANPIRG/16, through Decision 16/17, established the ATS Route Development Working Group (RDWG) to support the route development within the MID Region and at the interfaces with ICAO AFI, APAC and EUR Regions.

3.13 The meeting also recalled that MIDANPIRG/17, through Conclusion 17/18, Urged

States to use the RDWG as the main platform to facilitate bilateral and multilateral coordination related to the improvement of the ATS Route Network and airspace management in the MID Region.

3.14 The meeting reiterated the importance of a consolidated reference document for the Regional ATS routes to be used as the primary repository for proposals emanating from States and/or Airspace users. The Route Catalogue is maintained by IATA in close collaboration with the RDWG Core Team.

3.15 The meeting noted that the requirements/demands related to ATS routes are dynamic and frequently changing, based on varying operations models, different markets and various events within and adjacent to the MID Region.

3.16 Based on the above, the meeting noted the opportunity to further enhance the MID ATS Route network structure to keep pace with the changes and the need for consulting the airspace users in the implementations of new ATS Route segments, unidirectional direct PBN routes and FUA concept.

3.17 The meeting noted the proposal presented by IATA, related to a web-based tool "eRoute", which would manage the process of consultation between stakeholders. The proposal including quantifiable figures of Fuel/ CO_2 or carbon emissions will be communicated with States/ANSPs for review to further explore and discuss the possibilities of implementation.

3.18 Based on the above, the meeting agreed to task the RDWG, to discuss the MID ATS Route network enhancements, to review the proposal and to discuss the possibilities of the implementation.

MID Region ATM Contingency Plans

3.19 The subject was addressed in WP/9 and IP/4, presented by the Secretariat and IATA, respectively.

3.20 The meeting recalled the ICAO MID Doc. 003: ATM contingency plan, which was developed in accordance with Annex 11, to ensure safe continuation of air navigation operation in the event of disruption or possible disruption of ATS and related supporting services in the MID Region.

3.21 The meeting noted that the current version of the plan (available under ICAO MID website: https://www.icao.int/MID/MIDANPIRG/Pages/MID-Docs.aspx) has been frequently activated during the last period; due to natural or manmade events of disruption, or potential disruption, of Air Traffic Services and related supporting services in airspaces within the MID Region States; or within adjacent Regions, that are likely to affect the services within the MID Region.

3.22 The meeting noted that the current contingency plan was found still valid and serves the current needs. However, assignment of responsibilities, and sharing/exchanging of information in timely manner requires further improvements.

3.23 The meeting reiterated that States which experience or anticipate disruption of Air Traffic Services and/or related supporting services should advise, as early as practicable, the ICAO Regional Office accredited to them, and other States whose services might be affected. Such advice should include information on associated contingency measures or a request for assistance in formulating contingency plans. Furthermore, it was highlighted that the international organizations concerned provide valuable operational insight and experience, using the possible means under CCT process.

3.24 The meeting agreed that the MID Region ATM Contingency Plan should include provisions related to the management of public health pandemics; and encouraged States to adopt a unified contingency response and joint policy to strengthen future collaboration, considering the lessons learnt from COVID-19.

3.25 Based on all the above, the meeting agreed to the following Draft Decision:

DRAFT DECISION 7/2: MID ATM CONTINGENCY PLANNING AD-HOC ACTION GROUP

That,

a) the MID ATM Contingency Planning Ad-hoc Action Group be established to carry out a comprehensive review of the MID Region ATM Contingency Plan (MID Doc. 003), taking into considerations the lessons learnt from recent events; and

b) the MID ATM Contingency Planning Ad-hoc Action Group:

i. be composed of:

- *the Chairperson of the ATM SG;*
- *representatives from States and IATA (TBD); and*
- *ICAO MID Office (Secretariat).*

ii. present the revised version of the MID Region ATM Contingency Plan (MID Doc 003) to the ATM SG/8 meeting for review and fine-tuning, before presentation to the MIDANPIRG/20 meeting for endorsement.

MID ATFM Implementations

3.26 The subject was addressed in WP/4 presented by the Secretariat and the ATFM Chairperson.

3.27 The meeting recalled that MIDANPIRG/18 endorsed the MID ATFM CONOPS V1.0 through Conclusion 18/28 and tasked the ATFM TF to draft the Regional Framework and Common Operating Procedures, to support the implementation by States.

3.28 The meeting noted that the Secretariat, with the support of the Chairman and ATFM team members, has developed the Draft version of the MID ATFM Implementation Plan V2.0, which was circulated to the ATFM TF team members (MID States, ORGs and Core team) for feedback and comments.

3.29 The meeting reviewed and updated the Final Draft ATFM Implantation Plan V2.0, as at **Appendix 3D** and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 7/3: MID ATFM IMPLEMENTATION PLAN (V2.0)

*That, the MID Doc. 014: ATFM Implementation Plan (V2.0), at **Appendix 3D**, be presented to MIDANPIRG/19 meeting, for endorsement.*

3.30 The meeting encouraged States and Stakeholders to support the implementation of the Action items included in the MID ATFM Implementation Action Plan.

FWC2022 Progress

3.31 The subject was addressed in PPT/8 and PPT/23, presented by Qatar.

3.32 The meeting was apprised of the capacity enhancement projects by Qatar to facilitate the traffic movements during the FIFA World Cup 2022 event. The aircraft movements are expected to reach 950 movement/day, with a peak period during D-3 to D-Day that might reach 1600 movements/day and other peaks during the knockout phases of the tournament. The currently ongoing projects are:

- TMA Airspace Re-design
- FWC 2022™ Special Airspace (CDR & Temporary Holds)
- Civil-Military Co-operative Plans
- Implementation of FUA principles
- ATC Systems Upgrades
- ATC Procedures and System tools for capacity enhancement
- Capacity studies for runways and airspace
- Impact on adjacent Regional airspace (MIDRMA review)
- ATC Contingency systems upgrade
- ATFM Introduction
- Airline Slot Co-ordination

3.33 The meeting noted the ATFM implementation plan during the period of the event, based on the MID Region ATFM CONOPS V1.0 and the web-based tool for data exchange, which will enable the measurements of the demand vs capacity.

3.34 The meeting encouraged the FWC 2022 Chairman and Qatar, to share relevant information and plans with the concerned stakeholders (States and Airspace users), to allow them to actively participate in the implementation and allow sufficient time for training. The meeting reviewed the FWC 2022 Action Plan and agreed that the details will be reviewed by the FWC 2022 TF/6 meeting planned to be held Virtually, 7 – 8 Feb 2022 before presentation to MIDANPIRG/19 for endorsement.

RVSM Implementation and Monitoring (Development of MID RVSM SMR 2021-Initial Results)

3.35 The subject was addressed in WP/5, presented by the MIDRMA.

3.36 The meeting recalled MIDANPIRG/18 Conclusion, related to the development of SMR 2021.

3.37 The meeting reviewed the initial MID RVSM Safety Monitoring Report (SMR 2021) at **Appendix 3E**.

3.38 The meeting noted that the MIDRMA will continue working on the development of the final version of SMR 2021, until the end of the reporting cycle.

3.39 Based on the above, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 7/4: MID RVSM SAFETY MONITORING REPORT (SMR-2021)

That, the MID RVSM Safety Monitoring Report (SMR-2021) at ***Appendix 3E,*** *be presented to MIDANPIRG/19 for endorsement.*

3.40 The meeting noted that Tripoli FIR was excluded from the SMR 2021 due to the non-provision of required data.

3.41 The meeting noted the safety protocol which was opened at Muscat/Mumbai FIRs boundaries more than two years ago is still valid, and urged the concerned States to address the related issues.

3.42 The meeting noted with concern that Yemen continued to file an important number of LHD reports related to its adjacent FIRs and urged the concerned States in coordination with ICAO MID Office to address the related issues to avoid the effects on the overall risk of the MID RVSM airspace.

3.43 The meeting noted with appreciation the improvement in the reporting of LHDs further to the RVSM reporting webinar (held virtually, 4 November 2020), in particular the level of reports received from Egypt, Iran, Oman and Saudi Arabia.

3.44 The meeting urged States to continue providing the LHD reports of all categories on regular basis to the MIDRMA for the development of the annual SMRs.

Other ATM issues: MID Doc. 004: High Level Airspace Concept (HLAC)

3.45 The subject was addressed in WP/11, presented by the Secretariat.

3.46 The meeting noted that the work related to the HLAC AG has not progressed due to other priorities during the last period, and agreed that the HLAC AG continue working on the MID Doc 004 in order to present an improved and up-to-date version to the ATM SG/8 meeting.

Other ATM issues: GNSS /GPS Interference Reported in MID Region

3.47 The subject was addressed in WP/6, presented by UAE GCAA and IATA.

3.48 The meeting noted the increased number of GNSS/GPS interferences reported within the Region, identified mainly in two clusters:

a. Ankara, Baghdad and Tehran FIRs boundaries, mainly reported during cruise phase (enroute),

b. Eastern Mediterranean Airspaces (Cyprus, Egypt, Israel and Lebanon), mainly reported during approach, descend or climb (terminal procedures)

3.49 The meeting encouraged the Airspace users to continue monitoring the NOTAMs /advisories and reporting of the encountered GNSS/GPS outages/interferences.

3.50 The meeting recalled that RASG-MID endorsed RSA-14 on GNSS vulnerabilities in 2018. The meeting encouraged States to assess the operational risk of GNSS/GPS interference using the guidance materials in the RSA-14and implement the proposed mitigation measures, as applicable.

3.51 The meeting was briefed about the outcome of a special coordination meeting organized jointly with IATA and Paris Office for Iraq and Turkey on the subject. The meeting noted that it was agreed to develop a standard Regional NOTAM template to be used for GNSS interruption notification. In this regard, the meeting encouraged Airspace users to continue monitoring the NOTAMs, advisories and reporting of the encountered GNSS/GPS outages using the agreed reporting form/template and procedure.

Other ATM issues: SEIs related to ATM

3.52 The subject was addressed in WP/7, presented by the Secretariat.

3.53 The meeting reviewed the SEIs included in the MID-RASP 2020-2022 Edition, related to ATM.

3.54 The meeting noted the progress related to the MID CMC/FUA Action Group.

3.55 The meeting noted the lack of data (occurrences and/or safety analysis/information related to Near Mid Air Collisions (NMACs) including to the “Loss of separation between civil and military aircraft; shared by States and international Organizations).

3.56 The meeting urged States to share the occurrences data, in order to allow the ATM SG to perform technical analysis of the reported occurrences and/or safety analysis/information to provide recommendations.

Other ATM issues: Automatic Dependent Surveillance - Broadcast (ADS-B)

3.57 The subject was addressed in WP/22, presented by Saudi Arabia.

3.58 The meeting highlighted the operational benefits and the cost effectiveness of ADS-B implementation.

3.59 The meeting was informed that Saudi Arabia mandate related to ADS-B Out implementation in Class A and B Airspaces within Jeddah FIR was initially planned for 1 January 2020; however, based on the assessment results of the level of readiness on the ground infrastructure and aircraft equipage, Saudi Arabia postponed the mandate to 1 January 2023 with the inclusion of Class C, D and E airspaces (in addition to Class A and B) to all civil flights operations.

3.60 The meeting noted the progress of implementation of multi-sensor tracking connected to the ATM systems in the ATC units within Jeddah FIR.

3.61 The meeting encouraged the States intending to mandate the ADS-B carriage to consult the plans with Airspace users and MIDRMA for the MID Region registered aircraft capabilities.

Other ATM issues: Progress related to CMC/FUA Action Group

3.62 The subject was addressed in WP/10, presented by the Secretariat.

3.63 The meeting recalled the MIDANPIRG/18 Decision 18/31, related to the CMC/FUA Action Group.

3.64 The meeting noted the slow progress made by the CMC/FUA Action Group, due to other priorities and developments related to CMC.

3.65 The meeting noted different challenges related to CMC/FUA implementation and the need to raise awareness on different subjects, including:

- CMC/FUA implementation,
- Drones-Airspace management applications,
- GNSS/GPS interference,
- NMAC reports between Civil and military aircraft.

3.66 Based on the above, the meeting agreed to the following Draft Decision, to replace and supersede the MIDANPIRG/18 Decision 18/31:

DRAFT DECISION 7/5: MID CMC/FUA ACTION GROUP

That,

a) the MID CMC/FUA Action Group develop region specific complementary procedures for ICAO Doc. 10088, in order to ensure that the regional requirements related to Civil Military Cooperation and implementation of FUA Concept are addressed, including State aircraft operations under Due Regard in particular over the high seas, are covered;

b) the ICAO MID Office organize a CMC/FUA workshop/webinar in 2022, to raise awareness, and to address the related challenges; and

c) *the outcome of the MID CMC/FUA AG, be presented to the ATM SG/8 meeting, for review.*

Other ATM issues: Flight Plan Rejection Messages

3.67 The subject was addressed in WP/20, presented by UAE.

3.68 The meeting noted the concern raised by UAE related to the increased number of rejected messages issued by UAE due to non-adherence to Operational Reply Messages (ORM), and the distribution of DEP messages, which eventually resulted in stressful and potentially unsafe situation related to extra ATC workload due to coordination required for airborne holdings and possible diversions of traffic.

3.69 The meeting invited UAE to share the national requirements and list of the incidents that occurred with the MID Office, to follow-up and take necessary measures with the concerned Airspace users, through IATA.

Other ATM issues: Usage of ATC Simulators

3.70 The subject was addressed in WP/12, presented by the Secretariat.

3.71 The meeting recalled MIDANPIRG/18 Conclusion 18/33 related to the Use of ATC simulators to mitigate the ATCOs skill fade-out and rating validity (unit currency) during extended periods of low volume traffic and the practices of UAE in this regards.

3.72 The meeting reviewed the consolidated inputs received by MID States for their practices and recommendations.

3.73 The meeting invited UAE to present a WP to MIDANPIRG/19 to present a progress report on the subject.

3.74 The meeting encouraged the MID States and ANSPs to maximize the use of realistic simulation to mitigate ATCOs skill fadeout.

SAR Implementation issues

3.75 The subject was addressed in WP/13, presented by the Secretariat.

3.76 The meeting reviewed the SAR implementation in the MID States, and noted the related challenges.

3.77 The meeting encouraged ICAO MID to explore the means to support MID States in the elimination of SAR findings and deficiencies by, in particular, organizing a SAR implementation Seminar in 2022.

3.78 The meeting reviewed the SAR Point of Contact details (COSPAS-SARSAT website: http://www.cospas-sarsat.int/en/contact-lists-mccs-and-spocs), the MID Region SAR Focal Points list at **Appendix 3F** and urged MID States to provide updates if there are any.

Updates from MID States on ATM/SAR Implementation

3.79 The subject was addressed in PPTs/14A – H presented by Bahrain, Egypt, Jordan, Oman, Qatar, Saudi Arabia, Sudan and UAE, respectively.

3.80 The meeting noted with appreciation the developments reported by States, and urged States to provide detailed information and success stories to be included in the MID Air Navigation Report 2021, by 1 December 2021.

3.81 The meeting noted the different challenges faced by States, mainly focused on COVID-19 related issues and bi-lateral coordination meetings with adjacent States/Centres, to review and update the LoAs.

3.82 The meeting encouraged the MID States to coordinate with the ICAO MID Office to organize the bi-lateral coordination meetings.

REPORT ON AGENDA ITEM 4: MID AIR NAVIGATION STRATEGY

4.1 The subject was addressed in WP/15, presented by the Secretariat.

4.2 The meeting recalled MIDANPIRG Conclusions 18/11 and 18/12, related to ANS Performance Monitoring and MID Air Navigation Strategy.

4.3 The meeting reviewed the current implementation status of Priority 1 ASBU Threads and elements, at **Appendix 4A**.

4.4 The meeting encouraged States to review and update the status of implementation and urged them to provide the necessary data required for the development of the MID Air Navigation Report-2021, before 10 December 2021.

4.5 The meeting was apprised of the States' inputs related to the measurements of the MID Region list of KPIs, and noted that inputs have been provided from eight (8) States, representing 53.3%, namely, Egypt, Iran, Jordan, Kuwait, Oman, Qatar, Saudi Arabia and UAE. The data covered seventeen (17) out of 57 international aerodromes in the MID Region, representing 29.8% (HECA, HEBA, HESH, HEGN, HELX, HESN, HEMA, OIIE, OJAI, OKBK, OOMM, OTHH, OEDF, OEJN, OEMA, OERK and OMDB), as shown in **Appendix 4B**.

4.6 The meeting reviewed the results of measurement of KPIs (01, 02, 13 & 14) at **Appendix 4C,** and highlighted the following:

a) KPI 01 Regional Departure punctuality:
The States' reports show the percentage of departure punctuality in Egypt: 73.06%, Iran: 79.31%, Jordan: 81.21%, Kuwait: 51.59%, Oman: 82.89%, Qatar: 81.26%, Saudi Arabia: 88.40% and UAE: 78%.

b) KPI 14 Regional Arrival punctuality:
The State's reports show the percentage of arrival punctuality in Egypt: 56.73%, Iran: 74.01%, Jordan: 61.15%, Oman: 65.61%, Qatar: 46.20%, Saudi Arabia: 53.97% and UAE: 53%.

c) KPI 02 Regional Taxi-out Additional Time:
The State's reports show the average Taxi-out Additional Time in Egypt: 4.14, Iran: 4.31, Jordan: 3.89, Kuwait: 0, Qatar: 9.7, Saudi Arabia: 2.84 and UAE: 2.67 minutes per flight.

d) KPI 13 Regional Taxi-in Additional Time:
The State's reports show the average Taxi-in Additional Time in Egypt: 3.61, Iran: 0.07, Jordan: 0.18, Qatar: 1.53 and UAE: 1.60 minutes per flight.

4.7 The meeting recalled the importance of providing Traffic Data for the months of June and July 2021 for each of the International Aerodromes (AOP-1 Table), in order for the ICAO MID Office to be able to aggregate the KPIs at National level and then at Regional level In addition, the meeting underlined that in the aggregation of the KPIs at the National level, some States used just an average of the KPI calculated for each Aerodrome; however, it is important to use weight factors based on the volume of traffic movements in each aerodrome.

4.8 The meeting urged States to provide the data required for the development of the Air Navigation Report 2021, before 15 December 2021; including the data required for the measurement of the agreed list of KPIs, in order to allow the MID Office to consolidate all inputs to be included in the Report.

REPORT ON AGENDA ITEM 5: AIR NAVIGATION DEFICIENCIES IN THE ATM/SAR FIELDS

Air Navigation Deficiencies in the ATM and SAR fields

5.1 The subject was addressed in WP/16, presented by the Secretariat.

5.2 It was highlighted that in the ATM field, most of the deficiencies are related to the non-implementation of regional ATS Routes, uncompleted signature of contingency agreements and unsatisfactory reporting of Large Height Deviations (LHD) to the MIDRMA. In the SAR field, the deficiencies are related mainly to the lack of implementation of SAR provisions and non-compliance with the carriage of Emergency Locator Transmitter (ELT) requirements.

5.3 The meeting reviewed and updated the list of deficiencies in the ATM and SAR fields as at **Appendices 5A** and **5B**; respectively, and urged States to take necessary measures to implement the provisions of the MIDANPIRG/15 Conclusion 15/35, in particular the submission of a specific Corrective Action Plan (CAP) for each deficiency.

REPORT ON AGENDA ITEM 6: FUTURE WORK PROGRAMME

Working Arrangements and Future Working Programme

6.1 The subject was addressed in WP/17 presented by the Secretariat.

6.2 The meeting noted that Mr. Khalid Arabiyat, Director Air Traffic Management, Civil Aviation Regulatory Commission, Jordan, has been serving as the Chairperson of the ATM Sub-Group since the ATM SG/5 meeting (Aqaba, Jordan, 1 – 4 December 2019).

6.3 The meeting also noted, that Mr. Ahmed Mohammed Al-Eshaq, Director Air Navigation, Civil Aviation Authority, Qatar, had been elected as Vice-Chairperson during ATM SG/3 (Cairo, Egypt, 22 – 25 May 2017).

6.4 The meeting highlighted the MIDANPIRG Procedural Handbook, Part IV, Section 6 related to the election of Chairpersons. The meeting decided to maintain the same Chairpersons for one more term/meeting, and agreed to include the election of Chairpersons in the agenda of the next ATM SG meeting.

6.5 The meeting recalled MIDANPIRG Decision 18/49 related to the Frequency of the meetings on annual basis.

6.6 Taking into consideration the planned ICAO MID Regional events which are of relevance to the activity of the ATM Sub-Group, the meeting agreed that the ATM SG/8 meeting be scheduled during the period 7 – 10 November 2022, preferably physically (in-person). The meeting noted with appreciation the offer received from Jordan to host the ATM SG/8 meeting, and agreed that the ATM SG/8 meeting be organized as an in-person meeting in Amman, if the COVID-19 situation in Jordan and in the Region allows.

Revision of Terms of Reference (ToRs) of the ATM SG, ATFM TF and FWC2022 TF

6.7 The subject was addressed in WP/18, presented by the Secretariat.

6.8 The meeting reviewed the latest version of the ATM SG ToR at **Appendix 6A,** and agreed that they are still current.

6.9 The meeting reviewed and updated the Terms of Reference (ToR) of the ATFM and FWC 2022 TFs, at **Appendices 6B** and **6C,** respectively; and agreed to the following Draft Decisions:

DRAFT DECISION 7/6: TERMS OF REFERENCE OF THE ATFM TF

*That, the Terms of Reference of the ATFM TF be updated, as at **Appendix 6B.***

DRAFT DECISION 7/7: TERMS OF REFERENCE OF THE FWC 2022 TF

*That, the Terms of Reference of the FWC 2022 TF be updated, as at **Appendix 6C.***

REPORT ON AGENDA ITEM 7: ANY OTHER BUSINESS

PBN Sub-Group Outcomes

Updates related to MID FPP

7.1 The subject was addressed in PPT/19, presented by the Secretariat.

7.2 The meeting was apprised of the latest developments related to the establishment of the MID FPP.

7.3 The meeting re-iterated that the MID Flight Procedure Programme (MID FPP) is the optimal solution that would support States to develop sustainable capability in the instrument flight procedures (IFP) design, PBN airspace concepts and PBN OPS approval, including regulatory oversight. The MD FPP would also support States to overcome most of the identified challenges, which will foster the PBN implementation, and to meet their commitments under Assembly Resolutions A37-11 for Performance Based Navigation (PBN) implementation and the regional requirements, and comply with ICAO provisions related to flight procedure design and PBN. Accordingly, the meeting urged States to join the MID FPP through the signature of the MID FPP ProDoc, if they have not yet done so.

7.4 The meeting was informed that the MID FPP Manager has been recruited and is expected to report on duty in Abu Dhabi, UAE (hosting State of the MID FPP Office) beginning of January 2022.

7.5 The meeting noted that the MID FPP SC/1 meeting will be held virtually from 26 to 27 January 2022. During this meeting, it is expected to elect a Chairperson for the MID FPP SC, review and agree on the Work Plan for the year 2022, and on the necessary mechanism and way forward to ensure the sustainability of the Programme. The meeting encouraged all States to actively participate in the First Meeting of the MID Region Flight Procedure Programme Steering Committee (MID FPP SC/1).

CCO/CDO Implementations

7.6 The subject was addressed in WP/20, presented by the Secretariat.

7.7 The meeting noted the outcomes of the PBN SG/6 meeting, in particular, the significant challenges that States are facing in the implementation of the CCO/CDO and that the PBN SG/6 meeting proposed to conduct a workshop, in collaboration with champion States and International Organizations, to provide an overview on CCO/CDO requirements/provisions to gain insight into lessons learned and/or best practices on CCO/CDO implementation; as well as to promote the sharing of good practices: (phraseology, publication/charting, assessment of ENV benefits, etc.).

7.8 The Meeting noted that the PBN SG/6 meeting expressed the need for a harmonised AIP content related to CCO/CDO to ensure that identified good practices are shared and that Flight Crew / Flight Planners know where CCO/ CDO-related text may be found in an AIP.

7.9 In view of the above, the meeting noted the PBN SG/6 Draft Conclusion 6/1 on the conduct of a workshop related to CCO/CDO implementation in 2022 and the Draft Decision 6/2 related to the establishment of CCO/CDO Ad-hocWorking Group and invited States to participate actively in the upcoming CCO/CDO Workshop and designate representatives in the CCO/CDO Working Group.

MID Region PBN Implementation Plan

7.10 The meeting noted that the PBN SG/6 meeting reviewed the current version of the MID Region PBN Implementation Plan and identified the necessary changes/updates and recognized that the MID Region PBN Implementation Plan should be constantly updated and refined throughout the implementation process in order to keep pace with changes in MID Region Air Navigation Strategy (MID Doc 002) and to ensure alignment with the GANP 6th edition.

7.11 The meeting noted also that the PBN SG/6 meeting agreed to the Draft Decision 6/3 that, an Ad-hoc Working Group be established to review the MID Region PBN Implementation Plan and develop a revised version for submission to the MIDANPIRG/20 meeting for endorsement, to keep pace with the developments, including the GANP 6th Edition and the MID Region Air Navigation Strategy (MID Doc 002, Edition April 2021).

7.12 Considering the above, the meeting commended the work of the PBN SG/6 meeting and called upon States to designate representatives to the Ad-hoc Working Group to ensure the ATM expertise in the composition of the WG.

Traffic Recovery from Effects of COVID-19 Pandemic

7.13 The subject was addressed in IP/3, submitted by UAE.

7.14 The paper provided information from the perspective of UAE on how air travel is recovering amid COVID-19 pandemic.

Regional Contingency Plan and IATA's Global Contingency Portal

7.15 The subject was addressed in IP/4, submitted by IATA.

7.16 The paper provided information on the IATA Global Contingency Portal (IATA GCP), in reference to WP/9, related to communication and dissemination of critical information for Contingency coordination events as part of the CCT.

APPENDICES

FOLLOW-UP ACTION PLAN ON MIDANPIRG/18 CONCLUSIONS & DECISIONS

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 18/ 1	**MID RVSM SAFETY PROTOCOL PROCEDURE** That**,** the MID RVSM Safety Protocol Procedure at **Appendix 3.3A**, is endorsed.	Opened RVSM Safety Protocols	Procedure	MIDRMA/States	2021	**Completed (to be closed)**
C. 18/2	**PROCEDURE FOR TEMPORARY RVSM APPROVAL** That, the procedure for granting Temporary RVSM Approvals at **Appendix 3.3B**, is endorsed**.**	Granting Temporary RVSM approvals	Procedure	MIDRMA/States	2021	**Completed (to be closed)**
C.18/3	**PERFORMANCE BASED COMMUNICATION AND SURVEILLANCE (PBCS)** That, a) States provide the MIDRMA on monthly basis with the information related to the list of registered aircraft (fleet) granted approvals to operate in PBCS airspaces where compliance with specific RCP/RSP are required; b) the MIDRMA is authorized to coordinate and share information with other RMAs with respect to PBCS compliant aircraft and follow-up with MID States, as required; c) the MIDRMA functions and responsibilities be amended accordingly; and d) the implementation of PBCS be addressed by the RASG-MID, ATM SG and CNS SG for appropriate action.	Operational approvals for aircraft operating within PBCS airspaces	Compliant aircraft DB	MIDRMA/States	2021	**Completed (to be closed)**
C. 18/4	**MID RVSM SAFETY MONITORING REPORT (SMR) 2019** That, the MID RVSM Safety Monitoring Report (SMR) 2019 at **Appendix 3.3C**, is endorsed.	RVSM Safety monitoring report	SMR2019	MIDRMA/States	2020	**Completed (to be closed)**

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 18/5	**MID RVSM SAFETY MONITORING REPORT (SMR) 2020** That, the MID RVSM Safety Monitoring Report (SMR) 2020 at **Appendix 3.3D**, is endorsed.	RVSM Safety monitoring report	SMR2019	MIDRMA/States	2021	**Completed (to be closed)**
C. 18/6	**PREVENTING NON-RVSM APPROVED AIRCRAFT FROM OPERATING WITHIN MID RVSM AIRSPACE** That, in order to prevent the Non-RVSM approved aircraft from operating within the MID RVSM airspace**:** a) the MIDRMA: i. develop a search engine of updated "Global RVSM Approval Database" under the MIDRMA website, which can help MID ATCUs to check the RVSM approval status of any aircraft entering their area of responsibility; and ii. in order to increase the awareness on the subject, the MIDRMA issue a Bulletin which includes the list of the non-RVSM approved aircraft observed operating within the RVSM airspace and circulate it to all MIDRMA Member States on monthly basis; and b) the MID States/ATCUs: i. ensure that the non-RVSM approved aircraft listed in the MIDRMA Bulletin are not allowed to operate within the RVSM airspace; and ii. report to MIDRMA any case of violation, including the cases of aircraft transferred from adjacent Regions/FIRs.	Preventing the Non-RVSM approved aircraft from operating within the MID RVSM airspace	1. RVSM approval Search engine. 2. Monthly Non-RVSM approval bulletin.	MIDRMA	2021	**Completed (to be closed)**

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 18/7	**MID RVSM SAFETY MONITORING REPORT (SMR) 2021** That, a) the FPL/traffic data for the period 1 – 31 July 2021 and LHD Reports for the period 1 January 2021 to 31 December 2021 be used for the development of the MID RVSM Safety Monitoring Report (SMR 2021); b) only the appropriate Traffic Data as per MIDRMA requirements shall be submitted; any corrupted traffic data will be rejected; c) the traffic data must be submitted to the MIDRMA before 31 August 2021; and d) the final version of the MID RVSM SMR 2021 be ready for presentation to and endorsement by MIDANPIRG/19.	RVSM Safety monitoring report	SMR2019	MIDRMA/States	2022	**Actioned** SL issued AN 6/5.10.15A – 21/090 15 June 2021 TDS Data collected LHD pending to the end of the cycle (1 Jan 2021 – 31 Dec 2021) ATM SG/7 WP/5.
C. 18/8	**MIDANPIRG CART IMPLEMENTATION "PLAN OF ACTIONS"** That, in order to ensure States' ANS and related services provisions continuity, and the preparedness for the recovery phases: a) the MIDANPIRG CART Implementation "Plan of Actions" at **Appendix 5.1A** is endorsed; and b) States, ANSPs, Airspace users, airport operators and all concerned stakeholders are urged to support the implementation of the Plan of Actions at **Appendix 5.1A**, and exchange relevant operational data.	To support States/ANSPs in the implementation of CART	Support States/ANSPs in the implementatio n of CART	RPTF WS4	2021	**Ongoing** WS4 activities: Activity 1: ANS, Sustainable, Safe, and Resilient Operations: **Completed, Back to Normal** Activity 2: ATFM Operational Flexibility: **Ongoing** Activity 3: AIM: **Ongoing** Activity 4: Overflight Permissions: **Ongoing**

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 18/9	**THE MID REGION AIR NAVIGATION REPORT – 2020** That, the MID Region Air Navigation Report – 2020 is endorsed and be posted on the ICAO MID website.					**Completed (to be closed)**
C. 18/10	**MID REGION AIR NAVIGATION REPORT (2021)** That, States be urged to provide the ICAO MID Office, with relevant data necessary for the development of the MID Region Air Navigation Report – 2021, by **30 December 2021**.	Data for MID Region Air Navigation Report – 2021	ANR 2021	MIDANPIRG Subsidiary bodies	1 Dec 2021	**Ongoing** ATM SG/7 AI4 WP/14: Air navigation Strategy
C. 18/11	**ANS PERFORMANCE MONITORING** That, in order to optimize allocation and use of resources in the modernization of the air navigation system, States: a) be urged to: i. embrace a performance based approach in line with the 6th Edition of the Global Air Navigation Plan and the six-step performance management process, as described in the Manual on Global Performance of the Air Navigation System (Doc 9883); ii. follow-up a phased approach in the performance monitoring of their air navigation system using as an initial phase the list of KPIs at Appendix 5.2C; and iii. provide ICAO with the results of the KPIs monitoring for the agreed period, as part of the data necessary for the development of the Annual Air Navigation Report, starting with the Report for 2021. b) be encouraged to start as soon as possible, on an experimental basis, to establish the necessary processes, procedures and systems for the collection of necessary data to measure the selected KPIs.	ANS Performance monitoring	MIDANPIRG	MIDANPIRG Subsidiary bodies	31 Aug 2021	**Ongoing** ATM SG/7 AI4 WP/14: Air navigation Strategy

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 18/12	**REVISED MID AIR NAVIGATION STRATEGY** That the Revised MID Region Air Navigation Strategy (ICAO MID Doc 002) is endorsed and be published on the ICAO MID Office website.	Revised Air navigation Strategy Monitoring and Reporting of ASBU implementation in the MID Region	Doc 002	MIDANPIRG	2021	**Completed (to be closed)**
C. 18/13	**PROPOSAL FOR AMENDMENT TO THE MID eANP VOLUME II, TABLE ATM II-MID-I: MID REGION ATS ROUTE NETWORK** That, a) States and airspace users provide the ICAO MID Office with their inputs to the Table ATM II-MID-1 before 30 April 2021; and b) the ICAO MID Office, carry out necessary coordination to consolidate and process a proposal for amendment to the MID ANP Volume II, by 1 June 2021.	Updated ATS Route table information	ANP Vol II ATM II-MID-1 table		2021	**Ongoing** Actioned, SL ME 3&AN 6/5.8 – 21/057 Date 20 Apr 2021 Replies received from 11 States as follows: Bahrain, Egypt, Iran, Jordan, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE, Yemen. ATM SG/7 AI3 WP/3
C. 18/15	**AMENDMENT TO THE MID eANP VOLUME III** That, That, the MID eANP Volume III be amended as at https://www.icao.int/MID/Documents/eANP/MID%20eANP%20VOL%20III.pdf.					**Completed (to be closed)**
C. 18/16	**AMENDMENT OF THE eANP VOLUME III PART 0 AND PART I** That, the ICAO MID Office, carry out necessary coordination with ICAO HQ and other Regional Offices to amend the Regional Air Navigation Plans, Vol III, Part 0 and Part I to keep pace with the latest developments, including the alignment with the GANP 6th Edition.					**Ongoing**

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 18/28	**MID REGION ATFM CONOPS** That, the MID Region ATFM CONOPS V1.0 is endorsed and be published as MID Doc 014 on the ICAO MID website.					**Completed** MID Doc. 014 V1.0 posted

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 18/29	**ATM OPERATIONAL DATA EXCHANGE** That, in order to ensure better coordination between ANSPs and improve ATS planning: a) the MID ATM Operational Data Exchange process at **Appendix 5.2L**, is endorsed. b) Airspace users are invited to share with the ICAO MID Office the data related to their "Intention To Operate (ITO)" on monthly basis, for posting on the ICAO MID Office Secure Portal (Group "RO-MIDITO"); c) States be urged to nominate Focal Points/Coordinators for ATM data exchange; in order to be granted access to the ITO data available on ICAO MID secure portal; d) ICAO MID Office to organize periodic coordination meetings for ANSPs to exchange ATM operational data; and e) States ensure that the ITO and ATM Operational data are used solely for airspace management and ATC planning purposes during the recovery phase, and should not be shared outside the ATM community as it contains operational and financial sensitive data.					**Ongoing** ATM SG/7 AI3 WP4
C. 18/30	**MID REGION RVSM AIRSPACE SAFETY ASSESSMENT RELATED TO THE FWC 2022** That, the MIDRMA conduct a MID Region RVSM airspace safety assessment, to ensure that the overall risk is meeting the ICAO TLS; and identify the peak periods, hotspots, bottlenecks, etc., based on a worst case scenario, using the forecasted traffic during the FWC 2022 period and all historical LHD reports available within the MIDRMA database.					
D. 18/31	**MID CMC/FUA ACTION GROUP** That, the MID CMC/FUA Action Group: a) review the newly published ICAO Doc 10088, in order ensure					

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	that the regional requirements related to Civil Military Cooperation and implementation of FUA Concept, including State aircraft operations under Due Regard in particular over the high seas, are covered; and b) if necessary, draft, by 30 September 2021, complementary guidance.					
D. 18/32	**HIGH LEVEL AIRSPACE CONCEPT ACTION GROUP (HLAC AG)** That, the Terms of Reference and Work Programme of the MIDAMC STG be updated as at Appendix 6.2T. the High Level Airspace Concept Action Group (HLAC AG), composed of the ATM Focal Points from Bahrain, Egypt, Jordan, Oman, Saudi Arabia, UAE, IATA and ICAO MID, be established to review and prepare a revised version of the MID Region High Level Airspace Concept (MID Doc 004), by **31 August 2021**, for presentation to the ATM SG/7meeting and endorsement by the MIDANPIRG/19 meeting.	Considering the latest developments to be included in Doc. 004	Revised version of Doc 004		2021	**Ongoing** Inputs/comments received from AG members ATM SG/7 AI3 WP/11
C. 17/33	**USE OF ATC SIMULATORS** That, a) States are invited to provide the ICAO MID Office **by 30 April 2021** with their practices and experience on the use of ATC Simulators for refresher courses, competency checks and examination/assessment purposes to continuously ensure the level of proficiency during extended abnormal traffic periods (pandemics, crisis and similar events); and b) ICAO MID Office to consolidate the inputs from States to be shared with States and ICAO HQ, for appropriate action.	Fixable use of ATC simulators during extended low traffic period; for examinations / evaluation of ATCOs and maintaining the level of competency	Proposal for SARPS amendment		2022	**Actioned** SL ME 3 & AN 6/16 – 21/059 Dated 21 April 2021 Inputs received from States ATM SG/7 AI3 WP/12
D. 18/54	**TERMS OF REFERENCE OF THE ATM SG** That, the Terms of Reference of the ATM SG be updated as at **Appendix 5.4D**.					**Completed (to be closed)**

TABLE ATM II-MID-1 MID REGION ATS ROUTE NETWORK

EXPLANATION OF THE TABLE

Column

1	*Designator of ATS route and Type (Conventional, RNAV5 or RNAV1 etc.)*
2	*Significant points defining the ATS routes. Only prominent locations have been listed. Additional points where facilities are provided to complete navigational guidance along a route, but not otherwise marking significant characteristics of the route (change of heading of centre line, intersection with other routes, etc.) have normally not been included. Locations shown in parentheses indicate significant points outside the Region.*
Note 1.	*Not representing the operator's requirements. Operator's required route and/or navaids are shown in square brackets ([ ]).*
Note 2.	*Subject to further study. Including the associated navigation aid coverage.*
Note 3	*Subject to military agreement.*
Note 4.	*Not acceptable at present.*
Note 5.	*At present, implementation possible only during specific periods (e.g. weekends, nights, etc., as published).*
Note 6.	*At present, implementation of the RNAV route only possible above FL 300, or as published.*
Note 7.	*Unidirectional use.*
Note 8.	*For ATS route or part thereof is RNAV 1*
Note 9.	*ATS route actived by NOTAM*

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
~~A1~~	~~METRU 340000N 0250900E~~	~~UA1~~	~~METRU 340000N 0250900E~~
	~~SOKAL 323601N 0273706E~~		~~SOKAL 323601N 0273706E~~
	~~KATEX 320701N 0282436E~~		~~KATEX 320701N 0282436E~~
	~~BOPED 312939N 0292655E~~		~~BOPED 312939N 0292655E~~
	~~ALEXANDRIA (NOZ) 3111135N 02957013E~~		~~ALEXANDRIA (NOZ) 311113N 0295701E~~
	~~MENKU 310531N 0301806E~~		~~MENKU 310531N 0301806E~~
	~~CAIRO (CVO) 300532N 0312318E~~		~~CAIRO (CVO) 300532N 0312318E~~
A16	RASDA 330600N 0305700E	~~UA16~~	~~RASDA 330600N 0305700E~~
	MELDO 320201N 0310406E		~~MELDO 320201N 03104406E~~
	BALTIM (BLT) 313144N 0310721E		~~BALTIM (BLT) 313144N 0311035E~~
	DEGDI 311429N 0311035E		~~DEGDI 311429N 0311035E~~
	CAIRO (CVO) 300532N 0312318E		~~CAIRO (CVO) 300532N 0312318E~~
A408	~~(ADDIS ABABA) GWZ 090622N 0384612E~~ (SOLIR 135224N 421918E)	~~UA408~~	~~(ADDIS ABABA) GWZ 090622N 0384612E~~
	SALEH 140000N 042~~00~~2500E		~~SALEH 140000N 0420000E~~
	ORNIS 141615N0423657E		~~ORNIS 1416.215N0423657.9E~~
	HODEIDAH (HDH) 144622.1N 0425911.1E		~~HODEIDAH (HDH)1446.4N 04259.2E 144622N 0425911E~~
A410	KAFIA 084400N 0233100E		
	ALMAM 093345N 0244451E		
	RADAG 110340N 0270020E		
	ELOBEID (OBD) 130640.53N 0301335.25E		
	IMSUT 142048N 0312230E		
	RADKA 145006N 0315040E		
	VATEN 153358N 0323312E		
A411	(MITBA 333919N 0111142E)		
	TANLI 332938N 0113000E		
	CLAMS 331700N 0120800E		
	DERKA 330900N 0132202E		
	KAVOX 325700N 0145603E		
	GARUS 324000N 0170000E		
	PRAWN 324000N 0180500E		
	BENINA (BNA) 320728N 0201513E	~~UA411~~	~~BENINA (BNA) 3207.28N 0201513E~~
	MKILY 315900N 0222000E		
	NASER 315112N 0235518E		~~NASER 3151.12N 0235518.3E~~
	LOSUL 314100N 0250800E		~~LOSUL 314100N 250800E~~
	SIDI BARANI (BRN) 313432N 0260020E		~~SIDI BARANI (BRN) 3134532N 0260020E~~
A412	TANF (TAN) 332~~857~~900N 03839~~15~~20E	~~UA412~~	~~TANF (TAN) 332857N 0383915E~~
	RAFIF 331247N 0381919E		
	ZELAF 325~~656~~700N 03~~71121~~80000E		~~ZELAF 325656N 0371121E~~
	DAXEN 32444~~4~~5N 0374105E		~~DAXEN 324444N 0374105E~~
	~~ASLON 321211N 0365111E~~NADEK 322728N 0371429E		~~ASLON 321211N 0365111E~~
	~~NADEK 322728N 0371429E~~ASLON 321211N 0365111E		~~NADEK 322728N 0371429E~~
	KUPRI 320825N 0364530E		~~KUPRI 320825N 0364530E~~
	LUDAN 320256N 0363713E		~~LUDAN 320256N 0363713E~~
	GETUP 315833.47N 0363037.47E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	QUEEN ALIA (QAA) 314423.41N 0360926.59E		~~QUEEN ALIA (QAA) 314423N 0360926E~~
	OSAMA 315550N 0353706E		
~~W4~~ A414	DEBER 375006N 0580200E		
	BOJNORD (BRD) 372942.2N 0571923.8E		
	EGLUL 372407N 0564855E		
	ORSEK 370517N 0551109E		
	ALNIT 370022N 0544645E		
	GORGAN (GGN) 365544.7N 0542233.3E		
	IMPIR 364958N 0535846E		
	DATOL 364717N 0534706E		
	DASHT-E-NAZ (DNZ) 363853.6N 0531120.1E		
	LABET 360950N 0530127E		
	BUBUX 353023N 0524814E		
	DEHNAMAK (DHN) 351515.0N 0524312.0E		
~~Q415~~ A415	TONVO 250500N 0563200E		
	*Note 7 (UMEVU - TONVO)		
	LUBAT 250223N 0561749E		
	IMPED 245824.5N 0560406.2E		
	UKVAK 245147N 0553329E		
	GEVIV 244118N 0545000E		
	IMLIP 243648N 0543549E		
	KUGTO 243231N 0542224E		
	UKILI 243815.5N 0535636.4E		
	ALNEV 244601N 0534122E		
	KAXOB 245423N 0532450E		
	UMEVU 250545N 0530653E		
A416	TABRIZ (TBZ) 380853.5N 046124~~7~~6.5E	~~UA416~~	~~TABRIZ (TBZ) 380853N 0461247E~~
	EGVON 381647N 0475421E		
	ARDABIL (ARB) 381856.5N 0482605.1E		~~ARDABIL (ARB) 381856N 0482605E~~
	GIVTA 380050N 0484744E		
	GABMI 374115N 0491052E		
	RASHT (RST) 37193~~5~~4.8N 0493657.1E		~~RASHT (RST) 371935N 0493657E~~
	KOBUB 370621N 0501031E		
	EGMAN 370311N 0501827E		
	RAMSAR (RSR) 365412.5N 05040~~50~~49.6E		~~RAMSAR (RSR) 365412N 0504050E~~
	ALKUP 364702N 0510409E		
	NOSHAHR (NSR) 3639~~35~~46.1N 0512~~805~~751.4E		~~NOSHAHR (NSR) 363935N 0512805E~~
	IMKER 363938N 0515239E		
	MODEK 363918N 0523407E		
	DASHTE NAZ (DNZ) 36385~~5~~3.6N 0531120.1E		~~DASHTE NAZ (DNZ) 363855N 0531120E~~
	GORGAN (GGN) 365544.7N 0542233.3E		
	LOVEN 363926N 0553355E		
	ODKOL 363136N 0560702E		
	SABZEVAR (SBZ) 361011N 057341~~5~~4.9E		~~SABZEVAR (SBZ) 361011N 0573415E~~
	LOXED 355854N 0580609E		
	RIBUX 360112N 0582647E		
	MASHHAD (MSD) 361352.2N 059390~~1~~2E		~~MASHHAD (MSD) 361352N 0593901E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SOGES 351600N 0595822E		
	SOKAM 331316N 0603754E		~~SOKAM 331316N 0603754E~~
A418	KUMUN 254000N 0551515E	~~UA418~~	~~KUMUN 254000N 0551515E~~
	PAPAR 264000N 0542700E		~~PAPAR 264000N 0542700E~~
	*Note 7 (OI and OM)		~~*Note 7 (OI and OM)~~
	Segment KUMUN-PAPAR		~~Segment KUMUN-PAPAR~~
	SHIRAZ (SYZ) 293224N 05235~~20~~E		~~SHIRAZ (SYZ) 293224N 0523520E~~
A422	UROMIYEH (UMH) 374~~001~~114N 0450~~343~~503.7E	~~UA422~~	~~UROMIYEH (UMH374001N 0450343E~~
	RABEM 374841N 0452949E		
	SETNA 375615N 0455522E		~~SETNA 375615.3N 0455522.4E~~
	TABRIZ (TBZ) 380853.5N 046124~~7~~6.6E		~~TABRIZ (TBZ) 380853N 0461247E~~
	MURID 382744N 0463525E		
	DARUN 383339N 0464235E		
	DASDA 384135N 0465214E		
	PARSABAD-E-MOGHAN (PAD) 393443N 0475803E		~~PARSABAD (PAD) 393443N 0475803E~~
	PARSU 393748N 0480448E		~~PARSU 39374.8N 048044.8E~~
	~~KARAD 40181814.3N 0500356 04929.5E~~		~~KARAD 40181814.3N 0500356 04929.5E~~
	~~(BAKU)~~		~~(BAKU)~~
A424	~~LOVEK 322208N 0444001E~~	~~UA424~~	~~LOVEK 322208N 0444001E~~
	LOTAN 295942N 0433848E		~~LOTAN 295942.7N 04338.48E~~
	RAFHA (RAF) 2~~81950~~93713N 04~~60746~~32953E		~~RAFHA (RAF) 293718N 0432953E~~
	LUDEP 290948N 0430646E		
	TAMRO 283838N 0424047E		
	SIKLI 275801N 0420721E		
	HAIL (HIL) 272530N 041405~~8~~9E		~~HAIL (HIL) 272530N 0414058E~~
	*Note 7 (JDW-HIL)		
	HAMED 265133N 0411706E		
	LAKRO 263051N 0410241E		
	ORMAD 260353N 0404401E		
	GOMRA 253656N 0402534E		
	MIXUG 251537N 0401104E		
	MADINAH (PMA) 243251N 0394219E		~~MADINAH (PMA) 243251N 0394219E~~
	DEGVU 234245N 0393941E		
	ORMEK 233454N 0393917E		
	RULEB 230059N 0393731E		
	DATAP 223927N 0392910E		
	~~ASTOL 2255.00N 03935.12E~~		~~ASTOL 2255.00N 03935.12E~~
	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E		~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
A453	(GADER 294100N 0612800E)		
	PIRAN 293407N 0612809E	~~UA453~~	~~PIRAN 2934076N 06128096E~~
	ZAHEDAN (ZDN) 292912.3N 060540~~6~~5.7E		~~ZAHEDAN (ZDN) 292912N 0605406E~~
	ULOVI 291948N 0603429E		
	DANOV 291444N 0602357E		
	PEKES 285929N 0595221E		
	NABOX 281630N 0582601E		
	DAVEP 274226N 0572009E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	BANDAR ABBAS (BND) 271149.4N 0562200.3E		~~BANDAR ABBAS (BND) 271149N 0562200E~~
	PAVON 270206N 0561149E		
	GHESHM ISLAND (KHM) 264547.1N 055542~~8~~7.6E		~~GHESHM (KHM) 264547N 0555428E~~
	*Note 7 (KHM-BAH)		~~*Note 7 (KHM, BAH)~~
	SERDU 264715N 0545757E		
	ROSUM 264741N 0543637E		
	~~BANDAR LENGEH (LEN) 263210N 0545104E~~		~~BANDAR LENGEH (LEN) 263210N 0545104E~~
	~~KISH (KIS) 263131N 0535745E~~ KAPIP 264322N 0521403E		~~KISH (KIS) 263131N 0535745E~~
	MIDSI 264142N 0515442E		~~MIDSI 264142.7N0515442.5E~~
	BOTOB 263350N 0514505E		~~BOTOB 263350N 0514505E~~
	~~ALMOK 262832N 0513840E~~		~~ALMOK 262832N 0513840E~~
	SOLOB 262241N 0513132E		~~SOLOB 262241N 0513132E~~
	TOBLI 262134N0512301E		~~TOBLI 262134N0512301E~~
	SOGAT 262029N 0511443E		~~SOGAT 262029N 0511443E~~
	RIKET 261952N 0510954E		
	ASTAD 26181~~1~~2N 0505646E		~~ASTAD 261811N 0505646E~~
	BAHRAIN (B~~A~~HR) 2615~~51~~30N 0503~~856~~919E		~~BAHRAIN (BAH) 261551N 0503856E~~
	~~*Note 7 (OB, OI)~~		~~*Note 7 (OB, OI)~~
	ELOSO 262409N 050355~~0~~1E		~~ELOSO 262409N 0503550E~~
	EGMOR 26421~~0~~1N 050290~~6~~7E		~~EGMOR 264210N 0502906E~~
	LOTOR 264854N 0502200E		~~LOTOR 264854N 0502200E~~
	RAMSI 270249N 0500714E		~~RAMSI 270249N 0500714E~~
	ORNAK 27285~~3~~4N 0493248E		~~ORNAK 272853N 0493248E~~
	SOLEM 275229N 0491136E		~~SOLEM 275229N 0491136E~~
	KUMBO 281705N 04~~9~~85526E		~~KUMBO 281705N 0495526E~~
	~~AWADI 283430N 0484354E~~ GESAK 283430N 0484353E		~~AWADI 283430N 0484354E~~
	DEBTI 28440~~6~~7N 048292~~4~~5E		~~DEBTI 284406N 0482924E~~
	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E		~~KUWAIT (KUA) 291306N 04759036E~~
A454	~~(KARACHI (KC) 245443523.80N 06710540936.28E)~~	~~UA454~~	~~KARACHI (KC) 245443.6N 0671054.6E~~
	~~*Note 7 (KC-PASOV)~~		~~*Note 7 (KC-PASOV)~~
	~~BEGIM 2443023N 0670001E~~		~~BEGIM 2443.02N 06700.01E~~
	~~*Note 7 (OO, OP)~~		~~*Note 7 (OO, OP)~~
	~~MELOM 250334N 0663134E~~		~~MELOM 2503345.0N 06631342.0E~~
	~~PUNEL 251835N 0652245E~~		~~PUNEL 25183520.0N 06522453.0E~~
	(PARET 252518N 0645102E)		~~PARET 2525187.2N 0645102.5E~~
	*Note 7 (PARET-PASOV)		
	TAPDO 242400N 0612000E		~~TAPDO 242400N 0612000E~~
	VUSET 235540N 0590812E		~~VUSET 235540N 0590812E~~
	UMEKO N240620 E0583450		
	BORER N242623 E0573048		
	PASOV 243841N 0565037E		~~PASOV 243841N 0565037E~~
A647	NAZAR 363929N 0601926E		
	MASHHAD (MSD) 361352.2N 0593902.0E		
	SABZEVAR (SBZ) 361011.0N 0573414.9E		
	MITUS 360535N0565748E		
	ULANO 354937N 0550052E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	ODKAT 354650N 0544146E		
	MIRUR 354221N 0541139E		
	RAPKI 353454N 0532208E		
	BUBUX 353023N0524814E		
	VARAMIN (VR) 352033.6N 0513813.8E		
	IMAMKHOMAINI (IKA) 352434.8N 0511042.5E		
	RUDESHUR (RUS) 352643.7N 0505419.3E		
	LOXAM 350415N 0491601E		
	HAMADAN (HAM) 345200.8N 0483301.0E		
	KERMANSHAH (KMS) 342023.0N 0471008.9E		
	RAGET 333048N 0455348E		
A727	~~PAXIS 335706N 0272000E~~	~~UA727~~	~~(PAXIS 335706.1N 02720.00E~~
	~~OTIKO 313421N 0293636E~~		~~OTIKO 313421.3N 02936.36E~~
	~~ALEXANDRIA (NOZ) 311115N 0295703E~~		~~ALEXANDRIA (NOZ) 311115N 0295703E~~
	~~MENKU 310531N 0301806E~~		~~MENKU 310531.5N 0301806.1E~~
	CAIRO (CVO) 300532N 0312318E		~~CAIRO (CVO) 300532N 0312318E~~
	SOLAM 294201N 0313106E		
	RASMI 285901N 0314506E		
	SEMRU 280200N 0320306E		
	NABED 271801N 0321706E		
	LUXOR (LXR) 254458N 0324607E		~~LUXOR (LXR) 254458N 0324607E~~
	BOVAR 244140N 0322419E		
	LOPID 231900N 0315530E		
	ABU SIMBLE (SML) 222118N 0313719E		~~ABU SIMBLE (SML) 222118N 0313719E~~
	NUBAR 220000N 0313806E		~~NUBAR 220000N 03113806.1E~~
	SOMAK 190301N 0314717E		~~MEROWE (MRW) 182659N 0314907E~~
	MEROWE (MRW) 182~~659~~449N 03149~~07~~49E		~~KHARTOUM (KTM) 153358N 0323312E~~
	ALPOX 171131N 0320831E		~~KENANA (KNA) 130141N 0325423E~~
	GOPDA 161115N 0325135		~~LODWAR (LOV) 030627N 0353646E~~
	GAGNI 135430N 0324706E		
	KHARTOUM (KTM) 153358N 0323312E		
	KENANA (KNA) 13014~~1~~1N 0325423E		
	~~LODWAR (LOV) 030627N 0353646E(~~AVONO 092606N 0335418E~~)~~		
	KUTOP 080407.80N 0341704.20E		
	~~NAKURU (NAK) 001817S 0360919E~~EPSIX 063808N 0344002E		~~NAKURU (NAK) 001817N 0360919E~~
	~~NAIROBI (NV) 011800S 0365715E~~AMATO 051836N 0350124E		~~NAIROBI (NV) 011800S 0365715E~~
	~~KILIMANJARO (KV) 032540S 0370624E~~ANTAX 040000N 0352248E		~~KILIMANJARO (KV) 032540S 0370624E~~
	LODWAR (LOV) 030627N 0353646E		
A775	REXOD 211230N 0613830E	~~UA775~~	~~REXOD 211230N 0613830E~~
	TUMET 222307N 0595702E		~~TUMET 222307N 0595702E~~
	IMDEK 224647N 0592217E		~~IMDEK 224647N 0592217E~~
	OBTIN 230216N 0585920E		~~OBTIN 230216N 0585920E~~
	*Note 7 (OBTIN-KUSRA)		
	KUSRA 23~~1726~~2426N 058~~5102~~2611E		~~KUSRA 231726N 0585102E~~
A777	TONVO 250500N 0563200E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	*Note 7 (TONVO-VAXIM)		
	BUBAS 245938N 0570003E		
	~~*Note 7 (OO)~~		
	NADSO 244957N 0574926E		
	MUNGA 242516N 0584533E		
	MIXOL 240~~618~~523N 0592~~739~~959E		
	VAXIM 231900N 0611100E		
A788	HALAIFAH (HLF) 262603N 0391609E	~~UA788~~	~~HALAIFAH (HLF) 262603N 0391609E~~
	LOXOR 270903N 0410002E		
	HAIL (HIL) 272530N 041405~~8~~9E		~~HAIL (HIL) 272530N 0414058E~~
	ORNIL 273503N 0422443E		
	TOTAD 275043N 0433904E		
	LOXOM 275648N 0440832E		
	LOTOK 280834N 0450402E		
	HAFR AL BATIN (HFR) 28~~1950~~2126N 04607~~46~~03E		~~HAFR AL BATIN (HFR) 281950N 0460746E~~
	*Note 7 (HFR-PATIR)		~~*Note 7 (HFR-PATIR)~~
	DERKO 282751N 0465213E		
	SOROR 283417N 0473932E		
	WAFRA (KFR) 283715N 0475729E		~~WAFRA (KFR) 283715. 3N 0475729. 5E~~
	DEBTI 284407N 0482925E		
	BOXIK 284814N 0484734E		
	DANAL 285128N 0490450E		
	RETEL 285236N 0491048E		
	PATIR 285606N 0492923E		~~PATIR 285606N 0492923E~~
	KHARK ISLAND (KHG) 291550N 050190~~1~~0.7E		~~KHARK (KHG) 291550N 0501901E~~
	IVERA 292303N 0511540E		
	RUBAK 292617N 0514218E		
	SHIRAZ (SYZ) 293225~~5~~4.6N 052352~~20~~19.6E		~~SHIRAZ (SYZ) 293225N 0523520E~~
A791	LALDO 251806N 0563600E		
	GIDIL 251742N 0564923E		
	IMLOT 251708N 0570804E		
	KATUS 251600N 0574700E		
	PEDEX 251211N 0592131E		
	KINOX 250945N 0600942E		
	EGPIC 250811N 0603730E		
	EGRON 250444N 0613245E		
	(BIVIN 250349.80N 0614744.40E)		
~~B12~~	~~TANSA 340000N 0264900E~~	~~UB12~~	~~TANSA 340000N 0264900E~~
	~~SOKAL 323601N 0273706E~~		~~SOKAL 323601N 0273706E~~
	~~EL DABA (DBA) 310041N 0282801E~~		~~EL DABA (DBA) 310041N 0282801E~~
	~~KATAB 292501N 0290506E~~		~~KATAB 292501N 0290506E~~
	~~BOPOS 264318N 0300722E~~		~~BOPOS 264318N 0300722E~~
	~~DEPNO 262438N 0301413E~~		~~DEPNO 262438N 0301413E~~
	~~EL KHARGA (KHG) 252654N 0303527E~~		~~EL KHARGA (KHG) 252654N 0303527E~~
	~~ABU SIMBEL (SML) 222118N 0313719E~~		~~ABU SIMBEL (SML) 222118N 0313719E~~
B121	OXADU 350837N 0511226E		
	RUDESHUR (RUS) 3526443.7N 0505419.3E	~~UB121~~	~~RUDESHUR (RUS) 352644N 0505419E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	VEBER 354209N 0504400E		
	DAVMI 355657N 0503401E		
	PAXID 361703N 0502021E		
	ALTIV 364131N 0500330E		
	RARTA 365323N 0495516E		
	RASHT (RST) 37193~~5~~4.8N 0493657.1E		~~RASHT (RST) 371935N 0493657E~~
	SIVIT 373553N 0490511E		
	DASDA 384135N 0465214E		
	MAGRI 385408N 0462300E		~~MAGRI 385408N 0462300E~~
B400	MUSCAT (MCT) 233528.04N 0581536.48E	~~UB400~~	~~MUSCAT (MCT) 233528N 0581536E~~
	ITURA 232351N 0580720E		~~ITURA 232351N 0580720E~~
	GEPOT N232351 E0580720		
	GEVED N231446 E0580053		
	IZKI (IZK) 22531~~9~~8.6N 0574543~~3~~2.73E		~~IZKI (IZK) 225319N 0574543E~~
	DARAT N222000 E0572830		
	KEBAS N214330 E0570948		
	ITSAG N213720 E0570640		
	MEVLI N211632 E0565606		
	VUTAP N205411 E0564449		
	ORSIT N202306 E0562915		
	HAIMA (HAI) 195813.31N 056165~~1~~0.82E		~~HAIMA (HAI) 195813N 0561651E~~
	*Note 7 (HAI-DAXAM)		
	KUKDI N193022 E0555953		
	ITUVO N190315 E0554328		
	LABED N182135 E0551827		
	ASTUN 180832N0551040E		~~ASTUN 180832N0551040E~~
	DAXAM 171612N 0544715E		~~DAXAM 171612N 0544715E~~
	MUTVA 165325N 0543201E		~~MUTVA 165325N 0543201E~~
	IMKAD 155245N 0535147E		~~IMKAD 155245N 0535147E~~
	NODMA 152603N 053335~~8~~9E		~~NODMA 152603N 0533358E~~
	RIGAM 143932N 0530414E		~~RIGAM 143932N 0530414E~~
	RAPDO 132317N 0521532E		~~RAPDO 132317N 0521532E~~
	VEDET 120134N 05124~~1~~20E		~~VEDET 120134N 0512410E~~
	~~(MOGADISHU) MOGDU 020024N 0451736E~~		~~(MOGADISHU) MOGDU 020024N 0451736E~~
B403	~~MANDERA (MAV) 035625N 0415151E (MOGADISHU)~~ (AXIKU 112332N 0493519E)	~~UB403~~	~~MANDERA (MAV) 035625N 0415151E~~
	BOMIX 121002N 0502757E		~~BOMIX 121002N 0502757E~~
	ODBEN 123747N 0505648E		~~ODBEN 123747N 0505648E~~
	KAVAN 133250N 0515431E		~~KAVAN 133250N 0515431E~~
	RIGAM 143932N 0530414E		~~RIGAM 143932N 0530414E~~
B404	~~HARGA (HARGEISA) 093112N 0440530E~~(ESTIK 112206N 0471854E)	~~UB404~~	~~HARGA (HARGEISA) 093112N 0440530E~~
	DEMGO 120258N 0483040E		~~DEMGO 120258N 0483040E~~
	PURKA 131208N 0503042E		~~PURKA 131208N 0503042E~~
	GESIX 134440N 0512823E		~~GESIX 134440N 0512823E~~
	RIGAM 143932N 0530414E		~~RIGAM 143932N 0530414E~~
B407	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E	~~UB407~~	~~KING ABDULAZIZ (JDW) 214244N 0390723E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DENBU 210129N 0382031E		
	KAROX 205717N 0381547E		~~KAROX 205717N 0381547E~~
	MAHDI 202600N 0373918E		~~MAHDI 2026.00N 0373918.3E~~
	PORT SUDAN (PSD) 192404.12N 0371430.21E		~~(PORT SUDAN) (PSD) 192404N 0371430E~~
B411	~~ROVAR 292438N0345711E~~	~~UB411~~	~~ROVAR 292438N0345711E~~
	TAKSU 293625N 0343623E		~~TAKSU 293625N 0343623E~~
	*Note 7 (TAKSU-ULINA)		~~*Note 7 (TAKSU-ULINA)~~
	KARIK 292~~7~~633N 03446~~6~~541E		~~KARIK 292733N 0344641E~~
	ULINA 292451N 034581~~7~~8E		~~ULINA 292451N 0345817E~~
	ELETA 293201N 0352900E		~~ELETA 293201N 0352900E~~
	~~LORIK 293640N 0354840E~~TAMIM 293640N 0354840E		~~LORIK 293640N 0354840E~~
	PETRA 294206N 0362210E		
	DEESA 294509N 0364102E		~~DEESA 294509N 0364102E~~
	OBSOT 295451N 0373455E		
	AL SHIGAR (ASH) 300722N 0384753E		~~AL SHIGAR (ASH) 300722N 0384753E~~
	NEVOL 302446N 0393841E		
	KAVID 303552N 0401147E		
	ARAR (AAR) 305429N 0410832E		~~ARAR (AAR) 305429N 0410832E~~
	MURIB 311337N 0415136E		~~MURIB 311337N 0415136E~~
	RALTI 314208N 0430001E		
	RUKAM 315008N 0431938		
	ELODI 320256N 0435126E		
	LOVEK 322208N 0444001E		~~LOVEK 322208.1N 0444001.0E~~
	LONOR 323839N 0450458E		
	NOLDO 324932N 0452129E		~~NOLDO 324932.5N 0452129.5E~~
	PAPUS 325334N 0452707E		
	PAXAT 332056N 0460519E		~~PAXAT 332056N 0460519E~~
	ILAM (ILM) 333442.3N 0462455.4E		~~ILAM (ILM) 333442N 0462455E~~
	~~KERMANSHAH (KMS) 342023N 0471009E~~YASER 335850N 0470456E		~~KERMANSHAH (KMS) 342023N 0471009E~~
	IVELI 343459N 0482952E		
	DAXIL 345135N 0493454E		
	SAVEH (SAV) 35010~~7~~6.8N 050221~~7~~6.9E		~~SAVEH (SAV) 350107N 0502217E~~
	~~[TEHRAN] (TRN) 354149N 0511702E~~SOGOL 350829N 0503128E		~~[TEHRAN] (TRN) 354149N 0511702E~~
	OXADU 350837N 0511226E		
	NAGIN 350619N 0515308E		
	~~*Note 1~~		~~*Note 1~~
	DEHNAMAK (DHN) 35151~~4~~5N 052431~~3~~2E		~~DEHNAMAK (DHN) 351514N 0524313E~~
	*Note 7 (DHN-MSD)		
	GIBAB 353213N 0543656E		
	ITELO 353534N 0550052E		
	~~SABZEVAR (SBZ) 361011N 0573415E~~RABAM 355442N 0572955E		~~SABZEVAR (SBZ) 361011N 0573415E~~
	LOXED 355854N 0580609E		
	RIBUX 360112N 0582647E		
	MASHHAD (MSD) 361352.2N 0593902E		~~MASHHAD (MSD) 361352N 0593902E~~
	TANBU 353422N 0603430E		
	PAMTU 351006N 0610806E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
B412	HALAIFA (HLF) 262603N 0391609E	~~UB412~~	~~HALAIFA (HLF) 262603N 0391609E~~
	RABIGH (RBG) 224731N 0390550E		~~RABIGH (RBG) 224731N 0390550E~~
	KING ABDULAZIZ (JDW) 214244N 0390723E		~~[KING ABDULAZIZ] (JDW) 214244N 0390723E~~
B413	LADEN 185342N 0380506E		
	(DULAB 181006N 0390018E)		
	~~LADEN 185342N 0380506E~~KOBAS 170428N 0402029E	~~UB413~~	~~LADEN 185342.7N 0380506.1E~~
	DANAK 160800N 0412900E		~~1608.00N 04129.00E~~
	RIBOK 154700N 0415230E		
	ERSAL 151352N 0422905E		
	MIPIN 150608N 0423735E		
	HODEIDAH (HDH) 144622.10N 0425911.10E		~~HODEIDAH (HDH) 144622N 0425911E~~
	UKNAN 141839N 0432901E		
	ULBIR 135919N 0434940E		
	TAIZ (TAZ) 134150N 0440819E		~~TAIZ (TAZ) 134150N 0440819E~~
	GOMRI 131816N 0443224E		
	ADEN (KRA) 124952.20N 0450125E		~~ADEN (KRA) 124952N 0450125E~~
	UMEBU 121559N 0452325E		
	ZIZAN 115136N 0453912E		~~ZIZAN 1151.36N 04539.12E~~
	~~AVIMO 033252.9N 0505239.6E~~		~~AVIMO 033252.9N 0505239.6E~~
B415	DOHA HAMAD INTL (DOH) 251459.66N 051363~~5~~54.80E	~~UB415~~	~~DOHA HAMAD INTL (DOH) 251459N 0513635E~~
	*Note 8 (DOH-BUNDU)		~~*Note 8 (DOH-BUNDU)~~
	KUPSA 250445N 0521151E		~~KUPSA 250445N 0521151E~~
	BUNDU 250024N 0522924E		~~BUNDU 250024N 0522924E~~
	*Note 7 (BUNDU-~~ADV~~SIXIV)		~~*Note 7 (BUNDU-ADV)~~
	ASNAX 245659N 0524054E		
	EGPOG 244727N 0531950E		
	UKILI 243815.5N 0535636.4E		
	KUGTO 243231N 0542224E		
	~~LAGMI 245709N 0524148E~~RURAL 243045N 0543156E		~~LAGMI 245709N 0524148E~~
	~~GADVO 244126N 0534300E~~SIXIV 242009N 0550439E		~~GADVO 2441264N 0534300E~~
	~~KUNGU 243754N 05356.274E~~		~~KUNGU 243754N 05356.274E~~
	~~ABU DHABI~~		~~ABU DHABI~~
	~~ADV 242508N 0544024E~~		~~ADV 242508N 0544024E~~
B416	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E	~~UB416~~	~~KUWAIT (KUA) 291306N 0475803E~~
	*Note 7 (KUA-KUVER)		
	BOXIK 284814N 0484734E		
	IMDOX 283455N 0491438E		
	AMBIK 283222N 0492025E		~~AMBIK 283222N 0492025E~~
	*Note 8 (AMBIK-KUVER)		~~*Note 8 (AMBIK-KUVER)~~
	~~TESSO 282852N0492723E~~		~~TESSO 282852N0492723E~~
	~~GEVAL 282101N 0494300E~~		~~GEVAL 282101N 0494300E~~
	~~GOGMA 281421N 0495612E~~		~~GOGMA 281421N 0495612E~~
	KUVER 280924N 0500600E		~~KUVER 280924N 0500600E~~
	IMDAT 274100N 0511100E		~~IMDAT 274100N 0511100E~~
	DURSI 271219N 0520144E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	PEGET 270434N 0521515E		
	EGMIT 263340N 0530825E		
	LEVNA 261535N 0533857E		
	ORSAR 260430N 0535730E		~~ORSAR 260430N 0535730E~~
	PEBAT 255153N 0542357E		~~PEBAT 255153N 0542357E~~
	DESDI 253603N 0544230E		~~DESDI 253603N 0544230E~~
B417	EGVEL 344258N 0503005E		
	UKITA 330657N 0500041E		
	IMKEN 314407N 0493611E		
	BANDAR MAHSHAHR (MAH) 30332~~3~~2.8N 0490858E	~~UB417~~	~~MAHSHAHR (MAH) 303323N 0490858E~~
	UKNAR 295538N 0490450E		
	TULAX 293853N 0490301E		~~TULAX 2938 53N 04903 01E~~
	DESLU 292800N 0490150E		~~DESLU 2928.00N 0490150.8E~~
	EGVAL 292448N 0484545E		
	ALV~~I~~AX 29~~1918~~2030N04824~~1~~22E		~~ALVIX 2919.318N04824.12E~~
	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E		~~KUWAIT (KUA) 291306N 0475803E~~
	*Note 3		~~*Note 3~~
	BONIM 285929N 0472925E		
	BOSID 284234N 0465228E		
	HAFR AL BATIN (HFR) 28~~1950~~2126N 046074~~6~~03E		~~HAFR AL BATIN (HFR) 281950N 0460746E~~
	KING SAUD AB (KMC) 275250N 045332~~0~~1E		~~KING SAUD AB (KMC) 275250N 0453320E~~
	EMARO 273342N 0451330E		
	ALKIR 270758N 0444343E		
	RARLO 265939N 0443410E		
	ASNID 264600N 0441835E		
	GASSIM (GAS) 261753N 0434647E		~~GASSIM (GAS) 261753N 0434647E~~
	*Note 7 (JDW-GAS)		
	AMBIV 254816N 0431649E		
	KINOB 253146N 0430018E		
	KURDO 245306N 0422158E		
	BIR DARB (BDB) 241951N 0414928E		~~BIR DARB (BDB) 241951N 0414928E~~
	ASVIV 235~~458~~532N 041~~23~~2121E		~~ASVIV 235458N 0412321E~~
	~~TAGNA 231652N 0403851E~~DASOR 234116N 0410459E		~~TAGNA 231652N 0403851E~~
	PATOR 231639N 0403657E		
	EGREP 222754N 0395007E		
	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E		~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
~~Q18~~ B418	PAXER 345612N 0551237E		
	ITELO 353534N 0550052E		
	SOMAD 372645N 0543255E		
B419	~~DHAHRAN (DHA) 261538N 0500824E~~	~~UB419~~	~~DHAHRAN (DHA) 261538N 0500824E~~
	~~*Note 8 (DHA-RAMSI)~~		~~*Note 8 (DHA-RAMSI)~~
	KING FAHD (KFA) 262~~153~~951N 0494~~910~~643E		~~KING FAHD (KFA) 262153N 0494910E~~
	*Note 7 (KFA-RAMSI)		~~*Note 7 (KFA-RAMSI)~~
	NAGTO 263717N 0495137E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	KASES 264538N 0495709E		
	ITESA 265016N 0500014E		
	METLA 265645N 0500433E		~~METLA 265645N 0500432E~~
	RAMSI 270249N 0500714E		~~RAMSI 270249N 0500714E~~
~~Z622~~ B422	NARMI 261802N 0501939E		
	*Note 7 (NARMI-TOSNA)		
	TOSTA 262746N 0504913E		
	SOLOB 262241N 0513132E		
	VEDED 260558N 0514628E		
	ORSIS 252801N 0521636E		
	ENANO 252348N 0522559E		
	TOSNA 251612N 0524116E		
B424	ITOLI 152825N 0450927E	~~UB424~~	~~ITOLI 152825N 0450927E~~
	MEGPA 160017N 0461653E		
	LABRA 161813N 0465113E		
	IMTAN 163253N 0471943E		
	ALSOD 164203N 0473753E		
	TASBI 165853N 0481118E		
	KANEM 173700N 0492655E		
	IMPOS 183137N 0511848E		
	SABEL 185158N 0520339E		~~SABEL 185158200N 0520339.7E~~
	NOVNO 193313N 0535858E		
	OTISA 201000N 0554556E		~~OTISA 201000N 0554556E~~
	KASIN 201853N 0555742E		
	VELIK 203322N 0561656E		
	TUBSA 204029N 0562626E		
	VUTAP 205411N 0564449E		
	*Note 7 (VUTAP-GISKA)		
	GISKA 213503N 0574014E		~~GISKA 213503N 0574014E~~
B441	NABOX 281630N 0582601E		
	SILKO 295558N 0584138E		
	BOPAG 304413N 0584929E		
	KUVAV 313426N 0585747E		
	BIRJAND (BJD) 325820.7N 0591200.5E		
	BOPEB 331913N 0591448E		
	ASVIS 334633N 0591828E		
	NOTSO 351416N 0593034E		
	MASHHAD (MSD) 361352.2N 059390~~1~~2E	~~UB441~~	~~MASHHAD (MSD) 361352N 0593901E~~
	ALMUX 362736N 0605121E		
	OTRUZ 363108N 0610956E		~~OTRUZ 363108N 0610956E~~
	MARAD 363730.6N 06127.48E		~~MARAD 363730.6N 06127.48E~~
B451	DEHNAMAK (DHN) 35151~~4~~5N 052431~~3~~2E	~~UB451~~	~~DEHNAMAK (DHN) 351514N 0524313E~~
	RAPKI 353454N 0532208E		
	ITMEL 360729N 0542812E		
	SHAHROUD (SHR) 362522.3N 0550519.5E		
	RIBOB 371705N 0565226E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	BOJNORD (BRD) 37294~~3~~2.2N 0571923.8E		~~BOJNORD (BRD) 372943N 0571923E~~
	~~DOLOS 375006N 0580200E~~DEBER 375006N 0580200E		~~DOLOS 375006N 0580200E~~
	(ASHGABAT) (ASB) 380011N 0582008E		~~(ASHGABAT) (ASB) 380011N 0582008E~~
B457	NARMI 261802N 0501939E	~~UB457~~	~~NARMI 261802N 0501939E~~
	BAHRAIN (B~~A~~HR) 2615~~51~~30N 0503~~855~~919E		~~BAHRAIN (BAH) 261551N 0503855E~~
	TULUB 260644N 0510041E		
	DENVO 260452N 0510509E		~~DENVO 260452N 0510509E~~
	PATOM 25582~~2~~1N 0511836E		~~PATOM 255822N 0511836E~~
	EMISA 254658N 051420~~6~~7E		~~EMISA 254658N 0514206E~~
B505	LALDO 251806N 0563600E		
	*Note 7/8 (~~OO~~LALDO-PASNI)		
	NADSO 244957N 0574926E		
	ITLOB 244325N 0590701E		
	EGTAL 243458N 0603724E		
	APELO 243455N 0612000E		
	(PASNI (PI) 251717N 0632055E)		
B524	NADSO 244957N 0574926E		
	*Note 7 (NADSO-ALPOR)		
	DAMUM 243236N 0591307E		
	ASLOM 242113N 0600552E		
	VEKAN 241235N 0604454E		
	ALPOR 24044~~2~~1N 0612000E		
B526	KHARTOUM (KTM) 153358N 0323312E		
	DENDI 153006N 0341642E		
	KASSALA (KSL) 152427.47N 0362014.05E		
	TESON 152054N 0371042		
	(ASMARA (ASM) 151704.01N 038540~~3~~2.92E)		
	(ZULAC 150136N 0410106E)		
	~~(ASMARA) (ASM) 151704N 0385403E~~(PURAD 145500N 0415354E)	~~UB526~~	~~(ASMARA) (ASM) 151704N 0385403E~~
	FARES 145400N 0420100E		
	EMABA 145138N0421943E		
	HODEIDAH (HDH) 144622.10N 0425911.10E		~~HODEIDAH (HDH) 144622N 0425911E~~
	UMILI 144609N 0435133E		
	SOKAT 144606N 0440145E		
	PAVEN 144602N 0441112E		
	OBNAM 144541N 0444448E		
	PEBIX 144447N 0454637E		
	DASIT 144412N 0462931E		
	IVORA 144342N 0470342E		
	MEGPO 144257N 0473438E		
	RASBA 144124N 0484128E		
	MUKALLA (RIN) 144015.30N 0492329.30E		~~MUKALLA (RIN) 144015N 0492329E~~
	DANAN 144010N 0495334E		
	KUSOL 144009N 0501534E		
	TATNA 144000N 0515200E		
	RIGAM 143932N 0530414E		~~RIGAM 143932N 0530414E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
B527	KHARTOUM (KTM)153358N 0323312E		
	SUVRI 135436N 0321800E		
	RABAK 130110N 0320957E		
	MALAKAL (MLK) 093347.40N 0313911.41E		
	JUBA (JUB) 045234N 0313559E		
	OVELA 040000N 0311454E		
	(GOTOD 014501.20N 0305149.80E)		
B535	JUBA (JUB) 045234N 0313559E		
	TAPOS 055408N 0332002E		
	DAGAP 062400N 0341200E		
	(EPSIX 064014N 0343956E)		
	(IMTOR 064641N 0345102E)		
	(APKOD 074053N 0362448E)		
	(KOFTA 081258N 0372041E)		
	(ITPOT 084406N 0380951E)		
	(GAWASA (GWZ) 090622.33N 0384611.71E)		
	(ASOLE 095626N 0401357E)		
	(NIDEG 103632N 0412400E)		
	(LAKBE 110224N 0420939E)		
	(DJIBOUTI (DTI) 113254~~4~~5.67N 0430533~~7~~6.77E)		
	~~(DJIBOUTI) (DTI) 113255N 0430537E~~(KASOL 115248N 0433546E)	~~UB535~~	~~(DJIBOUTI) (DTI) 113255N 0430537E~~
	TORBA 121036N 0440206E		
	KATAN 122724N 0442728E		
	ADEN (KRA) 124952.20N 0450125E		~~ADEN (KRA) 124952N 0450125E~~
	BANAR 130604N 0453855E		
	TAMIM 134751N 0471703E		
	ULAXI 141524N 0482317E		
	BAROM 142432N 0484533E		
	MUKALLA (RIN) 144015.30N 0492329.30E		~~MUKALLA (RIN) 144015N 0492329E~~
	NAKAD 150056N 0500402E		
	EGMIX 151811N 0503810E		
	NANRI 160754N 0521603E		
	ASMAK 162327N 0524634E		
	KAPET 163322N 0530614E		~~KAPET 1633 22N 0530614E~~
	LADAR N165324 E0534655		
	SALALAH (SLL) 170259.35N 0540657~~7~~6.91E		~~SALALAH (SLL) 170259N 0540657E~~
	*Note 7 (ASTUN-SLL)		
	DARAB 174632N 0544902E		
	ASTUN 180832N 0551040E		~~ASTUN 180832N0551040E~~
~~Z627~~ B537	RANRU 300115N 0610048		
	LUDAX 295658N 0604101E		
	PEKES 285929N 0595221E		
	(OGOGO 302457N 0630904.20E)		
B538	ALEPPO (ALE) 3610476.86N 03712343.76E	~~UB538~~	~~ALEPPO (ALE) 361047N 0371234E~~
	KARIATAIN (KTN) 3412487.82N 0371551.15E		~~KARIATAIN (KTN) 341248N 0371551E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
B540	GERAR 240600N 0573616E		
	*Note 7 (GERAR-MIVEK)		
	DEGNU 242734N 0570613E		
	PASOV 243841N 0565037E		
	KUPMA 245148N 0562648E		
	~~BUBIN 245742N 0560642E~~ ORKOB 245309N 0562421E		
	MIVEK 245240N 0561516E		
~~W141~~ B541	LAR (LAR) 274030.7N 0542454.7E		
	NABEX 271157N 0541334E		
	DELBU 265021N 0540506E		
	KISH ISLAND (KIS) 263130.6N 0535744.7E		
	ORSAR 260430N 0535730E		
~~Z515~~ B543	LADLI 132724N 0451604E		
	DASIT 144412N 0462931E		
	GIBIT 154849N 0473804E		
	KANEM 173660N 0492655E		
	SILPA 184953N 0510158E		
	*Note 7 (SILPA-PUTSO)		
	MEDMO 194837N 0521027E		
	METNO 201418N 0524050E		
	DAXUT 203706N 0530802E		
	SEMSI 204455N 0531724E		
	DASAP 212047N 0540045E		
	DEBIN 214716N 0543309E		
	DARER 221152N 0550332E		
	MIDGU 222706N 0552230E		
	ITKUN 223731N 0553934E		
	KATAK 224811N 0555708E		
	EGVAN 230127N 0561907E		
	GENIR 231111N 0563630E		
B544	~~(GAZIANTEP) (GAZ) 365705N 0372823E~~(KILIS 364213N 0372402E)	~~UB544~~	~~(GAZIANTEP) (GAZ) 365705N 0372823E~~
	TUSYR 363915N 0372341E		
	ALEPPO (ALE) 361047N 0371234E		~~ALEPPO (ALE) 361047N 0371234E~~
	TUDMU 343100N 0380754E		
	TANF (TAN) 332~~857~~900N 03839~~15~~39E		~~TANF (TAN) 332857N 0383915E~~
	NAMBO 331826N0383939E		~~NAMBO 331826N0383939E~~
	DAPUK 330139.44N 0384026.29E		
	MODAD 323539.88N 0384138.14E		
	SODAR 315~~532~~602N 03843~~17~~26E		~~SODAR 315532N0384317E~~
	TURAIF (TRF) 3141~~3~~46N 038440~~5~~8E		~~TURAIF (TRF) 314136N 0384405E~~
	ORKAS 304725N 0384617E		
	AL SHIGAR (ASH) 300722N 0384753E		~~AL SHIGAR (ASH) 300722N 0384753E~~
	LABAD 291922N 0385411E		
	ENABI 290639N 0385550E		

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SOBAS 275600N 0390453E		
	HALAIFA (HLF) 262603N 0391609E		~~HALAIFA (HLF) 262603N 0391609E~~
	*Note 7 (PMA-HLF)		
	BELAL 254629N 0392523E		
	ALTEP 252157N 0393103E		
	MADINAH (PMA) 243251N 0394219E		~~MADINAH (PMA) 243251N 0394219E~~
	*Note 7 (PMA-JDW)		
	SISUD 234505N 0392538E		
	ASLAD 233742N 0392305E		
	RABIGH (RBG) 224731N 0390550E		~~RABIGH (RBG) 224731N 0390550E~~
	NOMDA 224257N 0390556E		
	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E		~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
	*Note 7 (NOBSU-JDW)		
	BOSUT 204705N 0393158E		
	LOVIL 201553N 0394537E		
	TORBI 195514N 0401610E		
	QUNFIDAH (QUN) 192211N 0410429E		~~QUNFIDAH (QUN) 192211N 0410429E~~
	RABGO 191452N 0411452E		
	ITESO 184436N 0415732E		
	ABHA (ABH) 181431N 0423925E		~~ABHA (ABH) 181431N 0423925E~~
	LALGI 173029N 0430453E		
	NOBSU 171554N 04313185E		~~NOBSU 171554N 0431318E~~
	MIXON 163035N 0432931E		
	IMSIL 155738N 0434112E		
	IMKAR 153511N 0435039E		
	MUTEX 152524N 0435445		
	NAGIL 152024N 0435651E		
	MISAN 150001N 0440522E		
	PAVEN 144602N 0441112E		
	GEVEL 141229N 0442547E		
	MOGEM 132655N 0444529E		
	ADEN (KRA) 124952.20N 0450125E		~~ADEN (KRA) 124952N 0450125E~~
B549	THAM~~U~~D 171700N 0495500E	~~UB549~~	~~THAMUD 171700N 0495500E~~
	ITELI 171310N 0502605E		~~ITELI 171310N 0502605E~~
	GOGRI 170752N 0510857E		~~GOGRI 170752N 0510857E~~
	TONRO 165850N 0522235E		~~TONRO 165850N 0522235E~~
	PUTRA 165432N 0525631E		~~PUTRA 165432N 0525631E~~
	LADAR 165324N 0534655E		~~LADAR 165324N 0534655E~~
	MUTVA 165325N 0543201E		~~MUTVA 165325N 0543201E~~
	KIVEL 165306N 0553633E		KIVEL 165306N 0553633E
G55	ABADAN (ABD) 302231.1N 0481314.2E		
	UKNAR 295538N 0490450E		
	KHARK ISLAND (KHG) 291550.0N 0501900.7E		
	BUSHEHR (BUZ) 285704.7N 0504933.5E		
	TOTNO 291052N 0515336E		
	SHIRAZ (SYZ) 293224.6N 0523519.6E		
G183	(KAROL 3252.00N 03229.00E)		
	PASOS 311300N 0330600E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	NADOL 311734N 0334100E		
	EL ARISH (ARH) 310423N 0334955E		
	TABA (TBA) 293624N 0344751E		
G202	(VELOX 3349.00N 03405.00E)	~~UG202~~	~~(VELOX 3349.00N 03405.00E)~~
	SILKO 3347.9N 03435.0E ELIKA 334455N 0343500E		~~SILKO 3347.9N 03435.0E~~ ~~ELIKA 334455N 0343500E~~
	KHALDEH (KAD) 334827N 0352910E		~~KHALDEH (KAD) 334827N 0352910E~~
	*Note 4 (OS)		~~*Note 4 (OS)~~
	DAKWE 3338.957N 03554595.0E		~~DAKWE 3338.957N 03554595.0E~~
	DAMASCUS (DAM) 33215~~4~~N 0362807E		~~DAMASCUS (DAM) 332154N 0362807E~~
	SOFIA 332301N 0364941E		
	ABBAS 332610N 0374320E		
	SULAF 332718N 0381027		
	TANF (TAN) 332~~857~~900N 03839~~15~~20E		~~TANF (TAN) 332857N 0383915E~~
	MODIK 332806.1N 0390100E		~~MODIK 332806.1N 03901.00E~~
	RAPLU 332300N 0414530E		~~RAPLU 3323.00N 0414530.5E~~
	PUSTO 332100N 0424500E		~~PUSTO 3321.00N 04245.00E~~
	DELMI 331918N 0431328E		~~DELMI 331918.31N 04313287.59E~~
	LAGLO 33153~~8~~9N 0441457E		~~LAGLO 331538N 0441457E~~
	ITOVA 331951N 0444129E		~~ITOVA 331950.91N 0444128.97E~~
	SINKA 332137N 0444753E		
	RAGET 333048N 0455348E		~~RAGET 3330.48N 04553.48E~~
	ILAM (ILM) 333442.3N 0462455.4E		~~ILAM (ILM) 333442N 0462455E~~
	ALTET 333209N 0470047E		
	MIPON 332801N 0475344E		
	KHORAM ABAD (KRD) 332603.1N 048173~~1~~0.7E		~~KHORAM ABAD (KRD) 332603N 0481731E~~
	UKSIS 332159N 0484002E		
	NOTSA 331745N 0490315E		
	RASLA 331202N 0493409E		
	UKITA 330657N 0500041E		
	BOMID 325904N 0504029E		
	IMRAG 325142N 0511643E		
	ESFAHAN (ISN) 334449.1N 051494~~1~~0.8E		~~ESFAHAN (ISN) 334449N 0514941E~~
	PARUG 324704N 0522947E		
	LABOT 324839N 0530053E		
	ALNER 325124N 0540202E		
	MITET 325226N 0542850E		
	NODLA 325330N 0545850E		~~NODLA 325330N 0545850E~~
	ORSOK 325502N 0554532E		
	IMSOG 325636N 0564649E		
	ROSOS 325815N 0584814E		
	BIRJAND (BJD) 32582~~1~~0.7N 0591200.5E		~~BIRJAND (BJD) 325821N 0591200E~~
	KAMAR 323900N 0604400E		~~(KAMAR 3239.00N 06044.00E)~~
G208	(PANJGUR (PG) 265710.21N 0640813.06E)		
	KEBUD 273552N 0625024E		
	DANIB 290706N 0611717E		
	ZAHEDAN (ZDN) 292912.3N 060540~~6~~5.7E		
	DAPAP 294630N 0602554E		
	TOVUS 300643N 0595235E		
	BOPAG 304413N 0584929E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DARBAND (DAR) 314659.4N 0565940.4E		
	NIVRA 315905N 0563810E		
	SOGOT 324008N 0552339E		
	NODLA 325330N 0545850E		
	~~ANARAK (ANK) 333215N 0534347E~~ROVAD 333131N 0535240E		
	~~TEHRAN (TRN) 354149N 0511702E~~RADAL 345423N 0522023E		
	ELEDI 350136N 0520356E		
	IMAM KHOMAINI (IKA) 352434.8N 0511042.5E		
	VEBER 354209N 0504400E		
	GOLNU 355711N 0502052E		
	PAROT 361128N 0495841E		
	LOXUB 363640N 0484942E		
	ZANJAN (ZAJ) 364647~~7~~6.8N 0482112~~2~~1.9E		
	AMBEX 370356N 0472143		
	GETOB 371227N 0465129E		
	PARAS 373133N 0454134E		
	TOTBO 373455N 0452858E		
	UROMIYEH (UMH) 374~~001~~114N 0450~~343~~503.7E		
	ALRAM 374230N 0443736E		
	(SIIRT)		
G216	LAKLU 232235N 0570401E	~~UG216~~	~~LAKLU 232235N 0570401E~~
	~~*Note 7 (OO/OP) (MCT-KC)~~IVAKU 232919N 0574103E		~~*Note 7 (OO/OP) (MCT-KC)~~
	MUSCAT (MCT) 233528.04N 0581536.48E		~~MUSCAT (MCT) 233528N 0581536E~~
	*Note 7 (LAKLU-SIDKA)		
	ITILA 234055N 0584817E		~~ITILA 234055N 0584817E~~
	SODEB 234747N 0593023E		~~SODEB 234747N 0593023E~~
	~~DORAB 235033N 0594746E~~DERTO 235033N 0594746E		~~DORAB 235033N 0594746E~~
	ALPOR 240441N 0612000E		~~ALPOR 240441N 0612000E~~
	~~LATEM 243144N 0644944E~~(SIDKA 240844N 0614745E)		~~LATEM 243144N 0644944E~~
	~~KARACHI (KC) 245443N 0671054E~~		~~KARACHI (KC) 245443N 0671054E~~
G452	SHIRAZ (SYZ) 293224.60N 052352~~20~~19.60E	~~UG452~~	~~SHIRAZ (SYZ) 293224N 0523520E~~
	NALBI 294650N 0535357E		
	RIKAS 295337N 0543224E		
	DAVUT 300214N 0552301E		
	GETIS 301145N 0562226E		
	KERMAN (KER) 301~~706~~658.1N 0465637~~7~~2.3E		~~KERMAN (KER) 301706N 0465637E~~
	ALKES 301045N 0573025E		
	ORDAD 300608N 0575454E		
	SILKO 295558N 0584138E		
	DANUS 293628N 0602030E		
	ZAHEDAN (ZDN) 292912.3N 0605406~~6~~5.7E		~~ZAHEDAN (ZDN) 292912N 0605406E~~
	DERBO 292542N 0611701E		~~DERBO 292542.7N 06117.01E~~
	~~(RAHIM YAR KHAN) (RK) 282156N 0701623E~~(SOKIR 290801N 0642502E)		~~(RAHIM YAR KHAN) (RK) 282156N 0701623E~~
G462	ROVOS 241825N 0552143E	~~UG462~~	~~ROVOS 241825N 0552143E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	*Note 7 (ROVOS-~~ITROK~~TUMAK)		~~*Note 7 to (ROVOS-ITROK)~~
	~~NIBAX 245748N 0541437E~~TUBGO 242403N 0551219E		~~NIBAX 245748N 0541437E~~
	~~RAGTA 250850N 0535840E~~ULODA 243530N 0545301E		~~RAGTA 250850N 0535840E~~
	KUVDA 244309N 0543909E		
	ORBOL 245134N 0542348E		
	UKUVO 251228N 0534707E		
	~~ALSOK 252607N 0533904E~~OXARI 252535N 0533458E		~~ALSOK 252607N 0533904E~~
	~~ITROK 253557N 0532751E~~PURLI 253644N 0532436E		~~ITROK 253557N 0532751E~~
	TUMAK 255031N 0531108E		~~TUMAK 255031N 0531108E~~
G482	TABRIZ (TBZ) 380853.5N 0461246.6E		
	MAGRI 385408N 0462300E		
G650	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E	~~UG650~~	~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
	RIBAM 204231N 0390551E		
	RASKA 190732N 0390329E		~~RASKA 190732N 0390329E~~
	~~ASMARA (ASM) 151704N 0385403E~~(DULAB 181006N 0390018E)		~~ASMARA (ASM) 151704N 0385403E~~
G652	ADEN (KRA) 124952.20N 0450125E	~~UG652~~	~~ADEN (KRA) 124952N 0450125E~~
	IVOSO 131734N 0453107E		
	BORIL 132617N 0454029E		
	IVORA 144342N 0470342E		
	MEMTA 150322N 0472434		
	DEKMA 152226N 0474553E		
	NABUP 155417N 0482143E		
	DANIN 160544N 0483438E		
	GIBAX 162047N 0485137E		
	IVINA 163253N 0490514E		
	THAMD 171700N 0495500E		
	IMPOS 18313~~6~~7N 0511848E		~~IMPOS 183136N 0511848E~~
	DUDRI 190000N 0520000E		~~DUDRI 190000N 0520000E~~
	*Note 7 & 8 (~~DUDRI~~NALKI-~~TOKRA~~DUDRI)		~~*Note 8 (DUDRI-TOKRA)~~
	DAVOX 194400N 0524817E		
	MIPUB 200004N 0530607E		
	GEROL 201443N 0532243E		
	OBSUS 203905N 0534952E		
	LONOV 211856N 0543516E		
	KOBES 214504N 0550526E		
	TOKRA 220925N 0553350E		~~TOKRA 220925N 0553350E~~
	*Note 7 (NALKI - TOKRA)		
	DEBAV 221532N 0554617E		
	DATBU 222243N 0560054E		
	NAMVA 223309N 0562223E		
	NALKI 224928N 0565614E		
	TULBU 230005N 0571827E		
	GEPOT 231446N 0580053E		
	KUSRA 232426N 0582611E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SODEB 234747N 0593023E		
	*Note 7 (TAPDO-SODEB)		
	VEKAN 241235N 0604454E		
	TAPDO 242400N 0612000E		~~TAPDO 242400N 0612000E~~
G656	JUBA (JUB) 045234N 0313559E		
	ATUGA 040000N 0314800E		
G660	(ARBEG 131355N 0205740)		
	GENEI 132859N 0222748E		
	EL FASHIR (FSR) 133554.09N 0251810.66E		
	EL OBEID (OBD) 130640.53N 0301335.25E		
	IMSUT 142048N 0312230E		
	RADKA 145006N 0315040E		
	KHARTOUM (KTM) 153357.93N 0323312.16E		
	BOPID 163948N 0335142E		
	PORT SUDAN (PSD) 192404.12N 0371430.21E	~~UG660~~	~~(PORT SUDAN) (PSD) 192404N 0371430E~~
	BOGUM 200636N 0380300E		~~BOGUM 2006.36N 03803.00E~~
	MIPOL 203322N 0382145E		~~MIPOL 203322N 0382145E~~
	*Note 7 (MILPO-JDW)		
	EGMEG 205130N 0383336E		
	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E		~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
G662	BUSRA 322000N 0363700E	~~UG662~~	~~BUSRA 322000N 0363700E~~
	KUPRI 320826N 0364530E		~~KUPRI 3208265.87N 0364530.21E~~
	DESLI 314900.10N 0365900.60E		
	ALKOT 313254N 0371122E		~~ALKOT 313254.22N 03711221.51E~~
	GURIAT (GRY) 312445N 0371712E		~~GRY 312445.8N 03717.12E~~
	*Note 7 (ASH-GRY)		
	AL SHIGAR (ASH) 300722N 0384753E		~~AL SHIGAR (ASH) 300722N 0384753E~~
	ODBAT 293221N 0392626E		
	NIMAR 290635N 0395425E		
	EGVOP 275458N 0411024E		
	HAIL (HIL) 272530N 041405~~8~~9E		~~HAIL (HIL) 272530N 0414058E~~
	DAROP 270505N 0421936E		
	MODIV 263842N 0430840E		
	GASSIM (GAS) 261753N 0434647E		~~GASSIM (GAS) 261753N 0434647E~~
	*Note 7 (GAS-KIA)		
	KUSRO 255138N 0444328E		
	VELOS 252126N 0454712E		
	KING KHALID (KIA) 245310N 0464534E		~~KING KHALID (KIA) 245310N 0464534E~~
G663	UMENA 262832N 0483952E		
	~~KING KHALID (KIA) 245310N 0464534E~~TABTA 262837N 0484325E	~~UG663~~	~~KING KHALID (KIA) 245310N 0464534E~~
	~~SILNO 264024N 0475742E~~*Note 7 (TABTA-ULADA)		~~SILNO 264024N 0475742E~~
	~~*Note 7 (KIA-KFA)~~		~~*Note 7 (KIA-KFA)~~
	~~GIBUS 255724N 0472829E~~		~~GIBUS 255724N 0472829E~~
	~~*Note 8 (GIBUS-ALSER)~~		~~*Note 8 (GIBUS-ALSER)~~
	KING FAHD (KFA) 262~~153~~951N 0494~~910~~643E		~~KING FAHD (KFA) 262153N 0494910E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	RABKA 263531N 0495728E		
	*Note 8 (~~GIBUS~~-ALSER)		
	ULADA 26452~~6~~7N 050162~~3~~4E		~~ULADA 264526N 0501623E~~
	LOTOR 264854N 0502200E		~~LOTOR 264854N 0502200E~~
	RAKAK 265221N 0502618E		~~RAKAK 265221N 0502618E~~
	TOLMO 265504N 0502927E		~~TOLMO 265504N 0502927E~~
	KOBOK 265839N 0503349E		~~KOBOK 265839N 0503349E~~
	~~ITIXA 270141N 0503735E~~		~~ITIXA 270141N 0503735E~~
	GETAL 2704~~09~~10N 05040~~39~~40E		~~GETAL 270409N 0504039E~~
	*Note 7 (DASDO-GETAL)		
	VEDOR 270855N 0504630E		~~VEDOR 270855N 0504630E~~
	ALSER 271100N 0504900E		~~ALSER 271100N 0504900E~~
	IMDAT 274100N 0511100E		
	DEPSU 283409N 0515047E		
	DASDO 285401N 0520551E		
	SHIRAZ (SYZ) 293224.6N 05235~~20~~19.6E		~~SHIRAZ (SYZ) 293224N 0523520E~~
	KINOT 303207N 0531731E		
	DEDAK 305600N 0533439E		
	BONEG 312826N 0535815E		
	YAZD (YZD) 31535~~2~~1.6N 054165~~8~~7.7E		~~YAZD (YZD) 315352N 0541658E~~
	BOMIT 321257N 0544414E		
	DANEM 322854N 0550717E		
	~~NODLA 325318N 0545848E~~SOGOT 324008N 0552339E		~~NODLA 325318N 0545848E~~
	ORSOK 325502N 0554532E		
	ALMUD 331758N 0561941E		
	RIBEN 332902N 0563620E		
	TABAS (TBS) 334021.2N 056533~~1~~0.9E		~~TABAS (TBS) 334021N 0565331E~~
	PATEN 340825N 0572334E		
	TASLU 342531N 0574131E		
	RAMIL 352909N 0584941E		
	MASHHAD (MSD) 361352.2N 059390~~1~~2E		~~MASHAD (MSD) 361352N 0593901E~~
G665	ARAR (AAR) 305429N 0410832E	~~UG665~~	~~ARAR (AAR) 305429N 0410832E~~
	ABADAN (ABD) 3022~~16~~31.1N 04813~~42~~14.2E		~~ABADAN (ABD) 302216N 0481342E~~
	DEMPO 301717N 0484329E		
	VATAN 300800N 0493533E		
	BOTAS 295241N 0505515E		
	KAVIL 294820N 0511704E		
	EGSIR 294615N 0512735E		
	SHIRAZ (SYZ) 293224.6N 05235~~20~~19.6E		~~SHIRAZ (SYZ) 293224N 0523520E~~
	*Note 5 (OI)		~~*Note 5 (OI)~~
	VAVAS 291650N 0535340E		
	BOTUX 285828N 0552205E		
	SOLAK 285156N 0555215E		
	ASMET 284758N 0561019E		
	NANTO 284140N 0563831E		
	RIGUT 283136N 0572226E		
	NABOX 281630N 0582~~5~~601E		~~NABOXD 281630.1N 0582501.8E~~
	LOXOL 274556N 0604538E		~~LOXOL 274556.9N 0604538.6E~~
	ASVIB 265724N 0631812E		~~ASVIB 265724N 0631812E~~
	(PANJGUR (PG) 265710.21N 0640813.06E)		~~(PANJGUR) (PG) 265710N 0640813E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
G666	SHIRAZ (SYZ) 293224.6N 05235~~20~~19.6E	~~UG666~~	~~SHIRAZ (SYZ) 293224N 0523520E~~
	KUPTO 282418N 0525432E		
	LAMERD (LAM) 272222.2N 0531102.3E		~~LAMERD (LAM) 272222N 0531102E~~
	LAVAN ISLAND (LVA) 264843.4N 0532121.1E		~~LAVAN (LVA) 264843N 0532121E~~
	~~*Note 7 (OI)~~		~~*Note 7 (OI)~~
	DATUT 263332N 0533538E		
	ELIRA 262105N 0534502E		
	ORSAR 260430N 0535730E		~~ORSAR 260430 .5N 0535730.5E~~
	~~ITITA 254410N 0541839E~~LUDAM 255508N 0535859E		~~ITITA 254410N 0541839E~~
	~~SINBI 250842N 0543741E~~KIVUS 254522N 0540032E		~~SINBI 250842N 0543741E~~
	TOTKU 253534N 0540410E		
	ULIVA 252647N 0540611E		
	~~ABU DHABI (ADV) 242508N 0544024E~~VEGEK 251837N 0540803E		~~ABU DHABI (ADV) 242508N 0544024E~~
	REVAV 250909N 0541012E		
	ITOMI 250152N 0541151E		
	ELOVU 245721.3N 0542017.5E		
G667	PUTMA 374800N 0515736E	~~UG667~~	~~PUTMA 3748.00N 05157.36E~~
	NOSHAHR (NSR) 3639~~35~~46.1N 0512~~805~~751.4E		~~NOSHAHR (NSR) 363935N 0512805E~~
	DANEB 362001N 0512408E		
	NAGMO 360214N 0512055E		
	TEHRAN (TRN) 354149.1N 0511170~~2~~1.6E		~~TEHRAN (TRN) 354149N 0511702E~~
	RUDESHUR (RUS) 352643.7N 0505419.3E		
	SOGOL 350829N 0503128E		
	SAVEH (SAV) 350107~~7~~6.8N 0502217~~7~~6.9E		~~SAVEH (SAV) 350107N 0502217E~~
	ARAK (ARK) 34081~~4~~3.9N 049511~~4~~3.8E		~~MIS ARAK (ARK) 340814N 0495114E~~
	RASLA 331202N 0493409E		
	ALTAX 323014N 0492142E		
	NAGRO 321015N 0491549E		
	RABIM 315839N 0491225E		
	EGVAX 314337N 0490802E		
	AHWAZ (AWZ) 312015.3N 0484552.5E		~~AHWAZ (AWZ) 312015N 0484552E~~
	GABSU 305319N 0483035E		
	ABADAN (ABD) 3022~~16~~31.1N 048134~~2~~14.2E		~~ABADAN (ABD) 302216N 0481342E~~
	ALSAN 295707N 0481456E		~~ALSAN 295707N 0481456E~~
	RALKA 292611N 0481819E		~~FRALKA 292611N 0481819E~~
	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E		~~KUWAIT (KUA) 291306N 0475803E~~
	WAFRA (KFR) 283715N 0475729E		~~WAFRA (KFR) 283715N 0475729E~~
	*Note 7 (KFR-~~MGA~~KIA)		~~*Note 7 (KFR-MGA)~~
	KATOD 283141N 0475554E		
	COPPI 275033N 0474359E		~~COPPI 275033N 0474359E~~
	~~*Note 8 (COPPI-AVOBO)~~		~~*Note 8 (COPPI-AVOBO)~~
	EMENI 273232~~2~~4N 0473849~~9~~8E		~~EMENI 273232N 0473849E~~
	~~MUSKO 272640N 0473708E~~RADGI 272640N 0473708E		~~MUSKO 272640N 0473708E~~
	~~ALSAT 270611N 0473118E~~MANNI 270812N 0473152E		~~ALSAT 270611N 0473118E~~
	LUGAL 264~~53~~603N 0472~~528~~235E		~~LUGAL 264533N 0472528E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	MAGALA (MGA) 261720N 0471225E		~~MAGALA (MGA) 261720N 0471225E~~
	AVOBO 260334N 0470719E		~~AVOBO 260334N 0470719E~~
	ESRAT 255117N 0470247E		
	KING KHALID (KIA) 245310N 0464534E		~~KING KHALID (KIA) 245310N 0464534E~~
	MUNTO 235345N 0463459E		
	DEBAS 231059N 0462728E		
	KITUB 224922N 0462342E		
	TABNA 211842N 0453653E		
	WADI ALDAWASIR (WDR) 203019N 0451219E		~~WADI ALDAWASIR (WDR) 203019N 0451219E~~
	TASMU 190016N 0450120E		
	NEJRAN (NEJ) 173625N 0442456E		~~NEJRAN (NEJ) 173625N 0442456E~~
	NETAS 172600N 0442305E		
	ELONA 165753N 0442124E		
	LABDO 164842N 0442032E		
	XABIP 161001N 0441653E		
	ASREM 154637N 0441443E		
	SANAA (SAA) 153000N 0441311E		~~SANA'A (SAA) 153000N 0441311E~~
	MISAN 150001N 0440522E		
	SOKAT 144606N 0440145E		
	DEPDA 143206N 0435807E		
	ULBIR 135919N 0434940E		
	PARIM 123142N 0432712E		~~PARIM 123142.7N 0432712E~~
	(DJIBOUTI (DTI) 11325~~5~~4.67N 043053~~7~~6.77E)		~~DJIBOUTI (DTI) 113255N 0430537E~~
G669	AL SHIGAR (ASH) 300722N 0384753E	~~UG669~~	~~AL SHIGAR (ASH) 300722N 0384753E~~
	AL JOUF (AJF) 294722N 0400418E		~~AL JOU (AJF) 294722N 0400418E~~
	VELAL 294602N 0403821E		
	PAXAN 294418N 0411833E		
	TOKLU 294213N 0420220E		
	RAFHA (RAF) 2~~81950~~93713N 04~~60746~~32953E		~~RAFHA (RAF) 293713N 0432953E~~
	NISER 293030N 0441825E		~~NISER 293030.5N 0441825.4E~~
	*Note 3 (OK)		~~*Note 3 (OK)~~
	SOLAT 290942N 0463810E		~~SOLAT 290942N 0463810E~~
	BUBER 291118N 0470057E		
	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E		~~KUWAIT (KUA) 291306N 0475803E~~
	~~SESRA 290803N 0485453E~~SESRU 290909N 0485450E		~~SESRA 290803N 0485453E~~
	NANPI 290457N 0493157E		~~NANPI 290457N 0493157E~~
	VELUT 291001N 0495341E		
	KHARK ISLAND (KHG) 291550N 050190~~1~~0.7E		~~KHARK(KHG) 291550N 0501901E~~
	IVERA 292303N 0511540E		
	RUBAK 292617N 0514218E		
	SHIRAZ (SYZ) 293224.6N 05235~~20~~19.6E		~~SHIRAZ (SYZ) 293224N 0523520E~~
G670	RASHT (RST) 37193~~5~~4.8N 0493657.1E	~~UG670~~	~~RASHT (RST) 371935N 0493657E~~
	MODIL 374925N 0494117E		
	LALDA 381615N 0494511E		~~LALDA 3817.1N 04943.0E~~
	(BAKU) GYD		~~(BAKU) GYD~~
G674	MADINAH (PMA) 243251N 0394219E	~~UG674~~	~~MADINAH (PMA) 243251N 0394219E~~
	*Note 7 (BPN-PMA)		
	KUKNI 245451N 0403140E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	EMURI 250545N 0405627E		
	ROSUL 253945N 0421519E		
	MUNPI 260112N 0430621E		
	GASSIM (GAS) 261753N 0434647E		~~GASSIM (GAS) 261753.9N 0434647.8E~~
	MOBAD 263607N 0442629E		
	SERPU 264608N 0444833E		
	BOPAN (BPN) 270314N 0452643E		~~BOPAN (BPN) 270314N 0452643E~~
G775	ASHGHABAT (ASB) 380011N 0582008E	~~UG775~~	~~(ASHGHABAT) (ASB) 380011N 0582008E~~
	ORPAB 374200N 0583430E		~~ORPAB 374200N 0583430.5E~~
	MIDMO 370543N 0590124E		
	MASHHAD (MSD) 361352.2N 059390~~1~~2E		~~MASHHAD (MSD) 361352N 0593901E~~
	NOTSA 351416N 0593034E		
	ASVIS 334633N 0591828E		
	BOPEB 331913N 0591448E		
	BIRJAND (BJD) 32582~~1~~0.7N 0591200.5E		~~[BIRJAND] (BJD) 325821N 0591200E~~
	*Note 1		~~*Note 1~~
	ODBES 323050N 0592556E		
	ELOKA 312325N 0595922E		
	LUDAX 295658N 0604101E		
	ZAHEDAN (ZDN) 292912.3N 060540~~6~~5.7E		~~ZAHEDAN (ZDN) 292912N 0605406E~~
~~Z680~~ G780	RIKOP 374026N 0581450E		
	BOJNORD (BRD) 372942.2N 0571923.8E		
	ODKOL 363136N 0560702E		
	IBRAV 362041N 0555430E		
	ULANO 355228N 0552043E		
	ITELO 353534N 0550052E		
G781	(VAN)	~~UG781~~	~~(VAN)~~
	BONAM 380~~256~~300N 0441~~759~~800E		~~BONAM 380256.9N 0441759.8.0E~~
	TUDNU 375301N 0444447E		
	UROMIYEH (UMH) 374~~001~~114N 0450~~343~~503.7E		~~UROMIYEH (UMH) 374001N 0450343E~~
	TUBAR 373018N 0452609E		
	ROVON 371601N 0455322E		~~ROVON 371601N 0455322E~~
	ZANJAN (ZAJ) 36464~~7~~6.8N 048211~~2~~1.9E		~~ZANJAN (ZAJ) 364647N 0482112E~~
	LABKA 364142N 0504342E		
	NOSHAHR (NSR) 3639~~35~~46.1N 0512~~805~~751.4E		~~NOSHAHR(NSR) 363935N 0512805E~~
G782	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E	~~UG782~~	~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
	*Note 7 (KFR-JDW)		
	KAPAV 220645N 0394620E		
	VEMEM 221554N 0400118E		
	BOPEV 225127N 0410011E		
	DAFINAH (DFN) 231658N 0414310E		~~DAFINAH (DFN) 231658N 0414310E~~
	ASMUN 233116N 0424514E		
	TUKVU 234626N 0435319E		
	RAGAHBA (RGB) 235533N 0443547E		~~RAGA\HBA (RGB) 235533N 0443547E~~
	DURMA 242710N 0454610E		
	KING KHALID (KIA) 245310N 0464534E		~~KING KHALID (KIA) 245310N 0464534E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	ESRAT 255117N 0470247E		
	AVOBO 260334N 0470719E		
	MAGALA (MGA) 261720N 0471225E		~~MAGALA (MGA) 261720N 0471225E~~
	~~*Note 7 (MGA-KFR)~~LUGAL 264~~53~~603N 0472~~528~~235E		~~*Note 7 (MGA-KFR)~~
	~~LUGAL 264533N 0472528E~~MAANI 270812N 0473152E		~~LUGAL 264533N 0472528E~~
	RADGI 272640N 0473708E		
	EMENI 273234N 0473848E		
	COPPI 275033N 0474359E		
	KATOD 283141N 0475554E		
	WAFRA (KFR) 283715N 0475729E		~~WAFRA (KFR) 283715N 0475729E~~
	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E		~~KUWAIT (KUA) 291306N 0475803E~~
G783	PURDA 210805N 0510329E	~~UG783~~	~~PURDA 210805N 0510329E~~
	ASNUR 212654N 0514335E		
	SILBU 214512N 0522304E		
	ALROK 215400N 0524217E		
	IMGOV 221828N 0533624E		
	DANUX 223605N 0541558E		
	TANSU 224136N 0542828E		~~TANSU 224136N 0542828E~~
	RIGIL 230146N 0551430E		~~RIGIL 230146N 0551430E~~
	UKRAG 233056N 0552306E		
	ELUDA 235107N 0552905E		~~ELUDA 235107N 0552905E~~
	ASPED 240036N 0553154E		
	~~ALN~~ VAVIM 241535.1N 055362~~3~~2.9E		~~ALN 241535N 0553623E~~
	*Note 7 (GIDIS-VAVIM)		
	DESVU 242222N 0554253E		
	GIDIS 243600N 0555600E		~~GIDIS 243600N 0555600E~~
	~~BUBIN 245742N 0560642E~~		~~BUBIN 245742N 0560642E~~
G792	BODKA 3939.0N 05130.0E	~~UG792~~	~~BODKA 3939.0N 05130.0E~~
	GIRUN 380612N 0562018E		~~GIRUN 3806.12N 0562018.3E~~
	BOJNORD (BRD) 37294~~3~~2.2N 0571923.8E		~~BOJNORD (BRD) 372943N 0571923E~~
	SILPO 370806N 0580006E		
	BOTEK 364755N 0583734E		
	MASHHAD (MSD) 361352.2N 059390~~1~~2E		~~MASHAD (MSD) 361352N 0593901E~~
	TANBU 353422N 0603430E		
	PAMTU 351006N 0610806E		
G795	RALKA 292611N 0481819E	~~UG795~~	~~FRALKA 292611N 0481819E~~
	*Note 7 (RALKA-BSR)		
	TASMI 300120N 0475505E		~~TASMI 300120N 0475505E~~
	BASRAH (BSR) 303132.30N 0472112.10E		~~BSR 303132.4N 0472112E~~
	RAFHA (RAF) 293713N 0432953E		~~RAFHA (RAF) 293713N 0432953E~~
G799	MADINAH (PMA) 243251N 0394219E	~~UG799~~	~~MADINAH (PMA) 243251N 0394219E~~
	*Note 7 (ELONU-PMA)		
	~~DAFINAH (DFN) 231658N 0414310E~~ELONU 240942N 0403053E		~~DAFINAH (DFN) 231658N 0414310E~~
L124	(VAN)	~~UL124~~	~~(VAN)~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	BONAM 380~~256~~300N 0441~~759~~800E		~~BONAM 380256.9N 04417598.0E~~
	~~URUMIYEH (UMH) 374001N 0450343E~~TUDNU 375301N 0444447E		~~URUMIYEH (UMH) 374001N 0450343E~~
	PARAS 373133N 0454134E		
	GETOB 371227N 0465129E		
	AMBEX 370356N 0472143		
	ZANJAN (ZAJ) 364647~~7~~6.8N 0482112~~2~~1.9E		~~ZANJAN (ZAJ) 364647N 0482112E~~
	TULGU 362836N 0484235E		
	SAVEH (SAV) 35010~~7~~6.8N 050221~~7~~6.9E		~~SAVEH (SAV) 350107N 0502217E~~
	EGVEL 344258N 0503005E		
	~~DISEL 332904N 0510118E~~PEKAM 332904N 0510118E		~~DISEL 332904N 0510118E~~
	SIVUD 330119N 0520009E		
	PARUG 324704N 0522947E		
	RANDU 323240N 0525917E		
	YAZD (YZD) 315352~~2~~1.6N 054165~~8~~7.7E		~~YAZD (YZD) (R654) 315352N 0541658E~~
	BOMUN 313648N 0544555E		
	UKVEV 310557N 0553718E		
	ALMOB 303434N 0562824E		
	KERMAN (KER) 301~~706~~658.1N 0465637~~7~~2.3E		~~KERMAN (KER) 301706N 0465637E~~
	PEKES 285929N 0595221E		
	SODOK 281113N 0613652E		
	KEBUD 27355~~8~~2N 0625028~~8~~4E		~~KEBUD 273558N 0625028E~~
	(PANJGUR (PG) 265710.21N 0640813.06E)		~~(PANJGUR) (PG) 265710N 0640813E~~
L125	(NAKHCHIVAN (NO) 390954.30N 0452909.40E)		
	DULAV 385700N 0453800E	~~UL125~~	~~DULAV 385700N 04538007.9E~~
	RABDI 384804N 0454431E		
	SIBVU 384444N 0454657E		
	~~TABRIZ (TBZ) 380853N 0461247E~~BUDED 375313N 0472032E		~~TABRIZ (TBZ) 380853N 0461247E~~
	~~ZANJAN (ZAJ) 364647N 0482112E~~MURPU 373043N 0480319E		~~ZANJAN (ZAJ) 364647N 0482112E~~
	ASPOK 365918N 0484948E		
	PAROT 36~~0940~~1128N 0495~~756~~841E		~~PAROT 360940N 0495756E~~
	GOLNU 355711N 0502052E		
	VEBER 354209N 0504400E		
	~~TEHRAN (TRN) 354149N 0511702E~~IMAM KHOMAINI (IKA) 352434.8N 0511042.5E		~~TEHRAN (TRN) 354149N 0511702E~~
	ELEDI 350136N 0520356E		
	RADAL 345423N 0522023E		
	~~ANARAK (ANK) 333215N 0534347E~~ROVAD 333131N 0535240E		~~ANARAK (ANK) 333215N 0534347E~~
	NODLA 325330N 0545850E		
	SOGOT 324008N 0552339E		
	NIVRA 315905N 0563810E		
	DARBAND (DAR) 314659.4N 0565940.4E		~~DARBAND (DAR) 314659N 0565940E~~
	BOPAG 304413N 0584929E		
	TOVUS 300643N 0595235E		
	DAPAP 294630N 0602554E		
	ZAHEDAN (ZDN) 292912.3N 0605406~~6~~5.7E		~~ZAHEDAN (ZDN) 292912N 0605406E~~
	DANIB 290706N 0611717E		~~DANIB 290706N 0611717E~~
	KEBUD 27355~~8~~2N 0625028~~8~~4E		~~KEBUD 273558N 0625028E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
L126	PUSTO 3321.00N 04245.00E	~~UL126~~	~~PUSTO 3321.00N 04245.00E~~
	SOGUM 3412.12N 0435454.9E		~~SOGUM 3412.12N 0435454.9E~~
	SIGNI 340006.1N 0444200.2E		~~SIGNI 340006.1N 0444200.2E~~
	MIGMI 334554.9N 0452724.4E		~~MIGMI 334554.9N 0452724.4E~~
	ILAM (ILM) 333442N 0462455E		~~ILAM (ILM) 333442N 0462455E~~
L200	OSAMA 315550N 0353706E		
	AMMAN (AMN) 320014.65N 0360357.55E		
	LOXER 320256N 362500E	~~UL200~~	~~LOXER 320256N 362500E~~
	MESLO 320231N0363148E		
	LUDAN 320256N 0363713E		~~LUDAN 320256N 0363713 E~~
	KUPRI 320825N 0364530E		~~KUPRI 320825N 0364530 E~~
	ASLON 321211N 0365111E		~~ASLON 321211N 0365111E~~
	NADEK 322728N 0371429E		~~NADEK 322728N 0371429E~~
	DAXEN 324444N 0374105E		~~DAXEN 324444N 0374105E~~
	ORNAL 324755N0375153E		~~ORNAL 324755N0375153E~~
	KAREM 325110N 0380324E		~~KAREM 325110N 0380324 E~~
	KUMLO 325811N 0382807E		~~KUMLO 325811N 0382807 E~~
	DAPUK 330139N 0384026E		~~DAPUK 330139N 0384026 E~~
	PASIP 330600N 0385600E		~~PASIP 330600N 0385600E~~
	GIBUX 330~~715~~500N 0411~~625~~100E		~~GIBUX 330715N 0411625E~~
	SIGBI 330200N 0422000E		~~SIGBI 330200N 0422000E~~
	SILBO 325900N 0432900E		~~SILBO 325900N 0432900E~~
L223	(AGRI (ARI) 393844.90N 0430137.50E)		
	*Note 7 (ARI-DASIS)		
	DASIS 385431~~1~~5N 04412~~29~~30E	~~UL223~~	~~DASIS 3854310N 044122930E~~
	*Note 7 (UMH-DASIS)		
	~~*Note 7 (OI-OM-OO SIR-LAKLU)~~UROMIYEH (UMH) 374~~001~~114N 0450~~343~~503E		~~UROMIYEH (UMH) 374001N 0450343E~~
	KAPES 372520N 0452004E		
	REXAN 355850N 0463935E		
	~~SANANDAJ (SNJ) 351420N 0470028E~~TAVNI 353807N 0465631E		~~SANANDAJ (SNJ) 351420N 0470028E~~
	TUKLO 351014N 0471751E		
	~~KHORAM ABAD (KRD) 332603N 0481731E~~UKSIS 332159N 0484002E		~~KHORAM ABAD (KRD) 332603N 0481731E~~
	~~MESVI 312920N 0495701E~~ALTAX 323014N 0492142E		~~MESVI 312920N 0495701E~~
	KIXOB 310917N 0502459E		
	EGSIR 294615N 0512735E		
	RUBAK 292617N 0514218E		
	TOTNO 291052N 0515336E		
	DASDO 285401N 0520551E		
	LAGSA 283306N 0522056E		
	LAMERD (LAM) 272222.2N 0531102.3E		~~LAMERD (LAM) 272222N 0531102E~~
	KISH ISLAND (KIS) 263130.6N 0535744.7E		
	SIRRI (SIR) 255452N 054320~~06~~11E		~~SIRRI (SIR) 255452N 0543206E~~
	~~*Note 7 (OI-OM-OO SIR-LAKLU)~~		~~*Note 7 (OI-OM-OO SIR-LAKLU)~~
	~~NALTA 250242N 0553955E~~TATLA 254753N 0544008E		~~NALTA 250242N 0553955E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	*Note 7 (TATLA-TARDI)		
	~~TARDI 243418N 0560915E~~VUTEB 253644.6N 0545149.4E		~~TARDI 243418N 0560915E~~
	~~LAKLU 232235N 05704 01E~~LOVEM 252645.4N 0551440.4E		~~LAKLU 232235N 05704 01E~~
	IVOXI 251239.6N 0552513.1E		
	LAGTA 250602N 0553315E		
	ANVIX 244655.0N 0555616.0E		
	PEDUL 244116N 0560205E		
	KIPOK 243611N 0560719E		
	TARDI 243418N 0560915E		
	LAKLU 232235N 05704 01E		
L300	LUXOR (LXR) 254458N 0324607E	~~UL300~~	~~LUXOR (LXR) 254458N 0324607E~~
	*Note 7 (YEN-LXR)		
	MEMPO 252518N 0335457E		~~MEMPO 252518N 0335457E~~
	OTEMO 250341N 0350810E		
	GIBAL 243713 N0363443E		~~GIBAL 243713.2N0363443.7E~~
	YENBO (YEN) 240858N 0380219E		~~YENBO (YEN) 2408.58N 03802193.9E~~
L301	(ANKOX 220256N 0662842E)		
	RASKI 230330N 0635200E	~~UL301~~	~~AURANGABAD (AAU) 19514053N 0752419338.6E~~
	VAXIM 231900N 0611100E		~~NOBAT 2109032.5N 06880000.1E~~
	*Note 7 (VAXIM-RAGMA)		
	RAGMA 232301N 0603846E		~~LADOT 220502N 0660001~~
			~~RASKI 230330N 0635200E~~
			~~VAXIM 231900N 0611100E~~
			~~RAGMA 232301N 0603846E~~
L305	DOHA HAMAD INTL (DOH) 251459.66N 05136354.80E	~~UL305~~	~~DOHA HAMAD INTL (DOH) 251459N 0513635E~~
	*Note 7 (DOH- ~~ITITA~~EMOTA)		~~*Note 7 (DOH-ITITA)~~
	*Note 8 (DOH-ASTOG)		~~*Note 8 (DOH-ASTOG)~~
	ORMAL 252304N 0522201E		~~ORMAL 252304N 0522201E~~
	ENANO 252348N 0522559E		~~ENANO 252348N 0522559E~~
	ALSEM 252703N 0524322E		~~ALSEM 252703N 0524322E~~
	ASTOG 252822N 0525025E		~~ASTOG 252822N 0525025E~~
	~~ITITA 54410N 0541839E~~PURLI 253644N 0532436E		~~ITITA 254410N 0541839E~~
	GODKI 254122N 0534347E		
	KIVUS 254522N 0540032E		
	ITBUL 254910N 0541227E		
	EMOTA 255254N 0542414E		
L306	TOKRA 220925N 0553350E	~~UL306~~	~~TOKRA 220925N 0553350E~~
	*Note 7 (~~OO~~TOKRA-LAKLU)		~~*Note 7 (OO)~~
	DEMKI 224941N 0562308E		~~DEMKI 224941N 0562308E~~
	LAKLU 232235N 0570401E		~~LAKLU 232235N 0570401E~~
L308	~~EGNOV 270301N 0474713E~~DAROR 270244N 0495815E	~~UL308~~	~~EGNOV 270301N 0474713E~~
	*Note 7 (~~EGNOV~~NAGSA- ~~SERSA~~DAROR)		~~*Note 7 (EGNOV- SERSA)~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	~~*Note 8 (EGNOV-OBNET)~~		~~*Note 8 (EGNOV- OBNET)~~
	~~JUBAIL (JBL) 270220N 04924267E~~		~~JUBAIL (JBL) 270220N 04924267E~~
	EGREX 270433N 0492158E		
	SILBA 270554N 0485301E		
	~~RAMSI 270249N 0500714E~~GESOR 270322N 0475751E		~~RAMSI 270249N 0500714E~~
	~~GASSI 270257.9N 0502229.5E~~SIBLI 265459N 0462334E		~~GASSI 270257.9N 0502229.5E~~
	~~TOSDA 270005N 0505629E~~ALMUL 262943N 0450553E		~~TOSDA 270005N 0505629E~~
	~~TORBO 265223N 0511024E~~NAGSA 261811N 0443117E		~~TORBO 265223N 0511024E~~
	~~SOGAN 263915N 0515408E~~GASSIM (GAS) 261753N 0434647E		~~SOGAN 263915N 0515408E~~
	DEGSO 261054N 0531946E		~~DEGSO 261054N 0531946E~~
	OBNET 260032N 0534514E		~~OBNET 260032N 0534514E~~
	ITITA 254410N 0541839E		~~ITITA 254410N 0541839E~~
	DESDI 253603N 0544230E		~~DESDI 253603N 0544230E~~
	RAGOL 252743N 0550739E		~~RAGOL 252743N 0550739E~~
	SERSA 251945N 0553118E		~~SERSA 251945N 0553118E~~
	TUKLA 251936N 0554010E		~~TUKLA 251936N 0554010E~~
	NADNI 251915N 0555658E		~~NADNI 251915N 0555658E~~
	LALDO 251806N 0563600E		~~LALDO 251806N 0563600E~~
	IMLOT 251708.1N 0570804.1E		~~IMLOT 251708.1N 0570804.1E~~
	KATUS 2516005.9N 05747.00E		~~KATUS 2516005.9N 05747.00E~~
	DIVAB 2510.7N 05952.1E		~~DIVAB 2510.7N 05952.1E~~
	EGPIC 2508.6N 06029.5E		~~EGPIC 2508.6N 06029.5E~~
	(JIWANI) (JI) 250350N 0614744E		~~(JIWANI) (JI) 250350N 0614744E~~
	LATEM 243144.7N 0644944.7E		~~LATEM 243144.7N 0644944.7E~~
L310	BOXAK 244536N 0540032E	~~UL310~~	~~BOXAK 244536N 0540032E~~
	*Note 7 & 8 to LALDO		~~*Note 7 & 8 to LALDO~~
	SIGBO 245526.4N 0545653.9E		~~SIGBO 245526.4N 0545653.9E~~
	NALTA 250242.7N 0553955.8E		~~NALTA 250242.7N 0553955.8E~~
	AVAMI 250554.9N 0555647.8E		~~AVAMI 250554.9N 0555647.8E~~
	LALDO 251806N 0563600E		~~LALDO 251806N 0563600E~~
L311	KAROX 205717N 0381547E		
	MAHDI 202600N 0373918E		
	PASIL 161331N 0332010E		
	VATEN 153358N 0323312E		
	RADKA 145006N 0315040E		
	IMSUT 142048N 0312230E		
	ELOBEID (OBD) 130640.53N 0301335.25E		
	RADAG 110340N 0270020E		
	ALMAM 093345N 0244451E		
	KAFIA 084400N 0233100E		
L313	TARDI 243418N 0560915E		
	KIPOK 243611N 0560719E		
	IMPED 245824.5N 0560406.2E		
	KULBA 251326N 0560153E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	EGPEP 255746.8N 0555822.5E		
L314	NABAN 163124N 0430148E	~~UL314~~	~~NABAN 163124N 0430148E~~
	DAROV 160637N 0431338E		
	GOBLO 154050N 0432550E		
	LUDOX 152034N 0433524E		
	RAMLO 151033N 0434007E		
	UMILI 144609N 0435133E		
	DEPDA 143206N 0435807E		
	GOMRI 131816N 0443224E		~~GOMRI 131816N 0443224E~~
L315	CAIRO (CVO) 300532N 0312318E	~~UL315~~	~~CAIRO(CVO) 300532N 0312318E~~
	*Note 7 (CVO- HGD)		
	OBTAV 280120N 0330657E		
	SOKOT 273104N 0333127E		
	HURGHADA (HGD) 271040N 0334747E		~~HURGHADA (HGD) 271040N 0334747E~~
	SOBEL 265011N 0341040E		
	*Note 7 (GIBAL- SOBEL)		
	MOGAP 260055N 0350455E		
	GIBAL 243713N 0363443E		~~GIBAL 243713.2N0363443.7E~~
L317	MAHDI 202600N 0373918E		
	AZAZA 173046N 0335009E		
	ASNON 150818N 0305312E		
	ITGAL 125209N 0281244E		
	KAPIB 104917N 0255200E		
	LOVAB 100147N 0245828E		
	KAFIA 084400N 0233100E		
L319	BAHRAIN (B~~A~~HR) 2615~~51~~30N 0503~~855~~919E	~~UL319~~	~~BAHRAIN (BAH) 261551N 0503855E~~
	*Note 7 (BAH- DASDO)		
	DAVRI 264936N 050573~~1~~2E		~~DAVRI 264936N 0505731E~~
	OBTAR 265934N 0510309E		~~OBTAR 265934N 0510309E~~
	DASDO 285401N 0520551E		
	IMGOD 301419N 0513050E		
	RADID 302444N 0512613E		
	NOTSA 331745N 0490315E		
	KEBEP 350454N 0474014E		
	PAREX 360527N 0465154E		
	ROVON 371601N 0455322E		
	PARAS 373133N 0454134E		
	TUDNU 375301N 0444447E		
	BONAM 380300N 0441800E		
L320	KAROX 205717N 0381547E		
	RAKTA 190506N 0352358E		
	SOGAD 171404N 0324125E		
	DATIM 152833N 0301323E		
	DELAM 144001N 0290644E		
	HASAN 130129N 0265813E		
	KISAL 101811N 0232526E		

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
L321	~~KATAB 292501N 0290506E~~OBRAN 302957N 0290522E	~~UL321~~	~~KATAB 292501N 0290506E~~
	*Note 7 (SML- OBRAN)		
	REXUM 301822N 0291917E		~~KUNKI 290726N 0291949E~~
	KUNKI 290726N 0291949E		
	SOBAM 264529N 0301336E		
	EGNAM 262856N 0301942E		
	GIBAD 253635N 0303807E		
	KUNAK 252745N 0304112E		~~KUNAK 252745.7N 03041.12E~~
	LUGAV 224205N 0313722E		~~LUGAV 224205N 0313722E~~
	ABU SIMBEL (SML) 222118N 0313719E		~~ABU SIMBEL (SML) 222118N 0313719E~~
L323	TONTU 223446N 0284313E		
	SISID 220000N0280838E		
	ASKOL 154854N 0240005E		
L324	(TEZAK 332750.40N 0314711.60E)		
	LAKTO 323800N 0320500E		
	GENIV 314831N 0330714E		
L333	(DORUK 391645N 0421107E)		
	DASIS 38543~~1~~5N 04412~~29~~30E	~~UL333~~	~~DASIS 385431N 0441229E~~
	BORES 382829N 0452137E		
	VUVAG 382529N 0452926E		
	TABRIZ (TBZ) 380853.5N 046124~~7~~6.6E		~~TABRIZ (TBZ) 380853N 0461247E~~
	RAKED 375621N 0470712E		
	BUDED 375313N 0472032E		
	RALGO 372840N 0490112E		
	RASHT (RST) 37193~~5~~4.8N 0493657.1E		~~RASHT (RST) 371935N 0493657E~~
	KOBUB 370621N 0501031E		
	EGMAN 370311N 0501827E		
	RAMSAR (RSR) 365412.5N 0504049.6E		
	ALKUP 364702N 0510409E		
	NOSHAHR (NSR) 363946.1N 0512751.4E		
	LABET 360950N 0530127E		
	MIRUR 354221N 0541139E		
	GIBAB 353213N 0543656E		~~GIBAB 3532137.0N 05436560.9E~~
	~~ALRAS 3511.3N 05541.6E~~ALROT 351116N 0554136E		~~ALRAS 3511.3N 05541.6E~~
	LUBIX 345214N 0563219E		
	TASLU 342~~632~~531N 0574~~234~~131E		~~TASLU 342632N 0574234E~~
	ALPEX 340919N 0582221E		
	ASVIS 334633N 0591828E		
	SOKAM 331316N 060375~~2~~4E		~~SOKAM 331316N 0603752E~~
	(DANOD 322422N 0620032E)		
L417	VUSEB 361637N 0434800E	~~UL417~~	~~VUSEB 361637N 0434800E~~
	DAXOG 354612N 0434527E		
	UMESA 351741N 0434307E		~~UMESA 351741N 0434307E~~
	MUTAG 343003N 0433834 E		~~MUTAG 343003N 0433834 E~~
	LAGLO 3351538.6 0441457.0E		~~LAGLO 3351538.6 0441457.0E~~
	ELOSI 330800N 0441800E		~~ELOSI 330800N 0441800E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	LOVEK 322208.1N 04440.01E		~~LOVEK 322208.1N 04440.01E~~
	ELIBA 320915N 0444645E		~~ELIBA 320915N 0444645E~~
	NADOX 310505N 0451851E		~~NADOX 310505N 0451851E~~
L425	~~KING ABDULAZIZ (JDW) 214244N 0390723E~~	~~UL425~~	~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
	BOSUT 204705N 0393158E		
	*Note 7 (BOSUT- BSH)		
	AMBAL 202506N 0401625E		
	GODSA 201258N 0404040E		
	~~TONBO 205502N 0394911E~~		~~TONBO 205502N 0394911E~~
	~~AL BAHA (BHA) 201733N 0413745E~~		~~AL BAHA (BHA) 201733N 0413745E~~
	BISHA (BSH) 195840N 0423728E		~~BISHA (BSH) 195840N 0423728E~~
	KATIX 200212N 0425406E		
	WADI ALDAWASIR (WDR) 203019N 0451219E		~~WADI ALDAWASIR (WDR) 203019N 0451219E~~
	EGREN 202236N 0464422E		~~EGREN 202236N 0464422E~~
	DENKU 201123N 0484331E		
	ASTIN 200410N 0495320E		~~ASTIN 200410N 0495320E~~
	~~DIRAS 195235N 0513704E~~MEDMO 194837N 0521027E		~~DIRAS 195235N 0513704E~~
	DAVOX 194400N 0524817E		
	GOBRO 193622N 0534741E		~~GOBRO 193622N 0534741E~~
	NOVNO 193313N 0535858E		~~NOVNO 193313N 0535858E~~
	ITUVO 190315N 0554328E		~~ITUVO 190315N 0554328E~~
	DEDSO 185811N 0560041E		~~DEDSO 185811N 0560041E~~
	BOVOS 182230N 0575844E		~~BOVOS 182230N 0575844E~~
	ASPUX 17440~~6~~4N 060000~~6~~4E		~~ASPUX 174406N 0600006E~~
	~~(TRIVANDRUM) (TVM) 082831N 0765531E~~(MAMIG 164100N 0614641E)		~~(TRIVANDRUM) (TVM) 082831N 0765531E~~
L427	KAROX 205717N 0381547E		
	BILAL 184044N 0330227E		
	ASRAV 172442N 0301943E		
	BOXIG 155958N 0272606E		
	GIPSA 150616N 0253946E		
	ELGENIENAD (GNA)132824.39N 0223207.30E		
L430	VAXIM 231900N 0611100E	~~UL430~~	~~VAXIM 231900N 0611100E~~
	ASLOM 242113N 0600552E		
	MESPO 244~~936~~817N 059~~3411~~5040E		~~MESPO 244936N 0593411E~~
	PEDEX 251211N 0592131E		
	NOVSU 263407N 0573849E		
	MELMI 264625N 0572300E		~~MELMI 264625N 0572300E~~
	VELAP 272556N 0565950E		
	TAVNO 281112N 056325~~2~~3E		~~TAVNO 281112N 0563252E~~
	ASMET 284~~827~~758N 056~~0806~~1019E		~~ASMET 284827N 0560806E~~
	SIRJAN (SRJ) 29332~~3~~2.5N 05539~~23~~37E		~~SIRJAN (SRJ) 293323.4N 0553923.6E~~
L438	LONOS 283027N 0491713E	~~UL438~~	~~LONOS 283027N 0491713E~~
	LOPOL 281849N 0492845E		~~LOPOL 281849N 0492845E~~
	ATBAG 280842N 0493844E		~~ATBAG 280842N 0493844E~~
	GODRI 280256N 0494307E		~~GODRI 280256N 0494307E~~
	RAKSO 275326N 0495032E		~~RAKSO 275326N 0495032E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	GOGRA 274918N 0495344E		~~GOGRA 274918N 0495344E~~
	OBNAX 272650N 0501103E		~~OBNAX 272650N 0501103E~~
	DEKTA 271605N 0501946E		~~DEKTA 271605N 0501946E~~
	VELOG 270215N 0503055E		~~VELOG 270215N 0503055E~~
	KOBOK 265839N 0503349E		~~KOBOK 265839N 0503349E~~
	MOGAS 264759N 0503909E		~~MOGAS 264759N 0503909E~~
	TOSTA 262746N 0504912E		~~TOSTA 262746N 0504912E~~
	ASTAD 261811N 0505646E		~~ASTAD 261811N 0505646E~~
L440	KANIP 241040.7N 05520.7E	~~UL440~~	~~KANIP 241040.7N 05520.7E~~
	*Note 7		~~*Note 7~~
	RETAS 235754N 0553423E		~~RETAS 235754N 0553423E~~
L443	RABAP 283625N 0492722	~~UL443~~	~~RABAP 283625N 0492722~~
	TESSO 282852N 0492723E		~~TESSO 282852N 0492723E~~
	LOPOL 281849N 0492845E		~~LOPOL 281849N 0492845E~~
	ENAVI 275552N 0493151E		~~ENAVI 275552N 0493151E~~
	GIRSI 274126N 0493310E		~~GIRSI 274126N 0493310E~~
	ORDAN 271706N 0495442E		~~ORDAN 271706N 0495442E~~
	RAMSI 270249N 0500714E		~~RAMSI 270249N 0500714E~~
	GASSI 270257N 0502229E		~~GASSI 270257N 0502229E~~
L444	KIPOL 230410N 0612903E	~~UL444~~	~~KIPOL 230410N 0612903E~~
	*Note 7 (~~OO~~KIPOL-TOLDA)		~~*Note 7 (OO)~~
	VUSIN 225940N 0605510E		~~VUSIN 225940N 0605510E~~
	MIBSA 225400N 0601338E		~~MIBSA 225400N 0601338E~~
	KAXEM 225103N 0595243E		~~KAXEM 225103N 0595243E~~
	IMDEK 224647N 0592217E		~~IMDEK 224647N 0592217E~~
	TOLDA 224008N 0583624E		~~TOLDA 224008N 0583624E~~
L513	MURAK 345600N 0364200E	~~UL513~~	~~MURAK 3456009.4N 0364200.1E~~
	BRAVO 344118N 0363500E		
	LEBOR 341~~5~~656N 0363~~4~~5~~9~~14E		~~LEBOR 341556.9N 03634595.0E~~
	LOTAX 335952N 0363231E		
	MALLA 335112N 0363154E		
	ADRAA 333648N 0363000E		
	DAMASCUS (DAM) 332154N 0362807E		~~DAMASCUS (DAM) 332154N 0362807E~~
	*Note 3 (OS)		~~*Note 3 (OS)~~
	RDIMA 330241N 0363200E		
	SWIDA 324342N 0363424E		
	BUSRA 322000N 0363700E		~~BUSRA 3220.00 N 03637.00 E~~
	LOSAR 320930.06N 0362849.77E		
	LOXER 320147.76N 0362251.46E		
	QUEEN ALIA (QAA) 314423.41N 0360926.59E		~~QUEEN ALIA (QAA) 314423N 0360926E~~
	QATRANEH (QTR) 311454.41N 0360334.31E		~~QATRANEH (QTR) 311454N 0360334E~~
	~~MAZAR 3049448.0N 036083510.0E~~MUNRA 304944N 0360835E		~~MUNRA MAZAR 3049448.0N 036083510.0E~~
L519	~~ABU DHABI (ADV)~~PATAT 261613N 0560059E	~~UL519~~	~~ABU DHABI (ADV)~~
	*Note 7 (~~OM~~PATAT-ATUDO)		~~*Note 7 (OM)~~
	~~NAMSI 243731.5N 05456.48E~~EGPEP 255746.8N 0555822.5E		~~NAMSI 243731.5N 05456.48E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	~~EMERU 244829N 0550303~~ITLAP 254925N 0555010E		~~EMERU 244829N 0550303~~
	~~LUDER 245733.5N 0550511.2E~~PUVAL 253558.0N 0554258.0E		~~LUDER 245733.5N 0550511.2E~~
	DETGU 252623.9N 0553604.6E		
	SERSA 251945N 0553118E		
	IVOXI 251239.6N 0552513.1E		
	VEKAL 250333.5N 0550340.5E		
	KUTLI 245151.3N 0545618.0E		
	GEVIV 244118N 0545000E		
	ELEPO 243211N 0544410E		
	ODKUN 242608N 0544017E		
	VUXOD 242005N 0543625E		
	ATUDO 241708.0N 0543432.0E		
L550	WAFRA (KFR) 283715N 0475729E	~~UL550~~	~~WAFRA (KFR) 283715N 0475729E~~
	NIDAP 28385~~0~~7N 0473656E		~~NIDAP 283850N 0473656E~~
	BOSID 2842~~27~~34N 0465~~401~~228E		~~BOSID 284227.4N 04654012.6E~~
	SIBSA 284506N 0462006E		
	LAKSO 284751N 0454129E		
	VATIM 285136N 0444443E		~~VATIM 2851.36N 0444443.7E~~
	RASMO 285713N 0433119E		~~RASMO 2857132N 0433119.3E~~
	ORSAL 290235N 0421107E		~~ORSAL290235.8N 04211070.8E~~
	TOLDI 290329N 0415621E		
	NORGI 290515N 0412546E		
	ULAKO 290758N 0403440E		
	NIMAR 290635N 0395425E		~~NIMAR 290635.6N 0395425.4E~~
	ENABI 290639N 0385550E		
	ASTUM 290628N 0382237E		
	OBNAK 290554N 0373032E		
	EGSIS 290515N 0362850E		
	KITOT 290205N 0345050E		~~KITOT 290205.1N 0345050.8E~~
	NUWEIBAA (NWB) 290156N 0344016E		~~NUWEIBAA (NWB) 290156N 0344016E~~
	~~TABA (TBA)~~		~~TABA (TBA)~~
	~~EL ARISH (ARH)~~		~~EL ARISH (ARH)~~
	KARIK 292733N 0344641E		~~KARIK 292733N 0344641E~~
	TAKSU 293625N 0343623E		~~TAKSU 293625N 0343623E~~
	DATOK 293624N 0341400E		~~DATOK 293624N 0341400E~~
	SERMA 312200N 0330834E		~~SERMA 312200N 0330834E~~
	GENIV 314831N 0330714E		
	PASOS 321300N 0330600E		~~PASOS 321300N 0330600E~~
	~~(KAROL 3252.0N 03229.0E)~~(STEPA 324859N 0322349E)		~~(KAROL 3252.0N 03229.0E)~~
L551	ANTAR 334800N 0281600E	~~UL551~~	~~ANTAR 334800N 0281600E~~
	~~EL DABA (DBA) 310041N 0282801E~~*Note 7 (NOZ-ANTAR)		~~EL DABA (DBA) 310041N 0282801E~~
	GOMVA 320010N 0292615E		
	NOGLI 321249N 0291811E		
	ALEXANDRIA (NOZ) 311115N 0295703E		
L554	NUBAR 220000N 0313824E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	PASAB 184553N 0313836E		
	SISOR 124543N 0313859E		
	ITOXA 102401N 0313908E		
	MALAKAL (MLK) 093347.40N0313911.41E		
	KUNDI 083920N 0313819E		
	EGBIM 072916N 0313716E		
	JUBA (JUB) 045234N 0313559E		
L555	TOTOX 215030N 0622230E	~~UL555~~	~~TOTOX 215030N 0622230E~~
	TUMET 222307N 0595702E		~~TUMET 222307N 0595702E~~
	TOLDA 224008N 0583624E		~~TOLDA 224008N 0583624E~~
L556	EGREN 202236N 0464422E	~~UL556~~	~~EGREN 202236N 0464422E~~
	NONGA 205048N 0492014E		~~NONGA 205048N 0492014E~~
	PURDA 210805N 0510329E		~~PURDA 210805N 0510329E~~
	*Note: 7 (PURDA-KUTVI)		~~*Note: 7 (OO, OB)~~
	IVABO 204749N 0530058E		
	SEMSI 204455N 0531724E		
	OBSUS 203905N 0534952E		
	IMDAM 202416N 0550801E		~~IMDAM 202416N 0550801E~~
	OTISA 201000N 0554556E		~~OTISA 201000N 0554556E~~
	KEDON 200503N 0555901E		
	HAIMA (HAI) 195813.3N 056165~~1~~0.82E		~~HAIMA (HAI) 195813N 0561651E~~
	GIVNO 195011N 0563059E		~~GIVNO 195011N 0563059E~~
	KUTVI 184306N 0582642E		~~KUTVI 184306N 0582642E~~
L558	DASTU 074921N 0330800E		
	IMDUR 074114N 0323107E		
	EGBIM 072916N 0313716E		
	DASAG 070454N 0294914E		
	ASKON 061745N 0262537E		
~~T557~~ L557	TUMAK 255031N 0531108E		
	*Note 7 (TUMAK-RAGAS)		
	VEDOM 260109N 0524456E		
	ORLUP 260651N 0523216E		
	VELAK 261307N 0521821E		
	RAGAS 263537N 0521337E		
~~T509~~ L559	DAPOK 235956N 0572959E		
	*Note 7 (DAPOK-FJV)		
	PASOV 243841N 0565037E		
	MENSA 245750N 0563249E		
	FUJAIRAH (FJV) 250603N 0562116E		
L560	LAKTO 323800N 0320500E		
	LOVEX 0320951.69N 0322847.72E		
	SERMA 312200N 0330834E		
	VUTAR 0293627.47N 0334901.26E		
	SIMSA 0291428.47N 0335715.76E		

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SHARM EL SHEIKH (SHM) 275953N 0342448E		
	SILKA 263400N 0352900E		
L561	MAHDI 202600N 0373918E		
	SUVRI 135436N 0321800E		
	NABUS 110003N 0295910E		
	ZENUB 094106N 0285841E		
	ASKON 061745N 0262537E		
L564	DOHA/HAMAD ~~INTL~~ (DOH) 251459.66N 051363~~5~~4.80E	~~UL564~~	~~DOHA/ HAMAD INTL~~
	~~(DOH) 251459N 0513635E~~		~~(DOH) 251459N 0513635E~~
	LADEM 245545N 0513714E		~~LADEM 245545N 0513714E~~
	EMEXA 245052N 0513604E		
	DATRI 244239N 0513407E		~~DATRI 244239N 0513407E~~
	DENSI 242519N 0512959E		~~DENSI 242519N 0512959E~~
	*Note 8 (DOH-~~PURDA~~)		~~*Note 8 (DOH-PURDA)~~
	BATHA (BAT) 241257N 0512707E		~~BATHA (BAT) 241257N 0512707E~~
	SOMAL 232844N 0512716E		
	KUTNA 231341N 0512730E		
	MIGMA 225035N 0512749E		~~MIGMA 225035N 0512749E~~
	RAGPO 222759N 0510600E		
	LOTOS 220000N 0503912E		~~LOTOS 220000N 0503912E~~
	ALNUG 213009N 0500453E		~~ALNUG 213009N 0500453E~~
	NONGA 205048N 049201~~2~~4E		~~NONGA 205048N 0492012E~~
	DENKU 201123N 0484331E		~~DENKU 201123N 0484331E~~
	GERUG 185530N 0473402E		~~GERUG 185530N 0473402E~~
	ASKET 181905N 0470113E		~~ASKET 181905N 0470113E~~
	PATOG 180241N 0464631E		~~PATOG 180241N 0464631E~~
	VUVOD 173941N 0463200E		~~VUVOD 173941N 0463200E~~
	TULIS 173033N 0462616E		~~TULIS 173033N 0462616E~~
	ULBON 17142~~5~~6N 046151~~5~~2E		~~ULBON 171425N 0461515E~~
	RAGNI 163454N 0454815E		~~RAGNI 163454N 0454815E~~
	LOPAD 161651N 0453738E		~~LOPAD 161651N 0453738E~~
	ITOLI 152825N 0450927E		~~ITOLI 152825N 0450927E~~
	OBNAM 144541N 0444448E		~~OBNAM 144541N 0444448E~~
	GEVEL 141229N 0442547E		~~GEVEL 141229N 0442547E~~
	NOPVO 135436N 0441536E		~~NOPVO 135436N 0441536E~~
	TAIZ (TAZ) 134150N 0440819E		~~TAZ 134150N 0440819E~~
	PARIM 123142N 0432712E		~~PARIM 123142N 0432712E~~
L566	ASMAK 162327N 0524634E	~~UL566~~	~~ASMAK 162327N 0524634E~~
	UKNEN 160542N 0522012ETAKMI 160542N 0522012E		~~UKNEN 160542N 0522012E~~
	PURUG 151204N 0510142E		~~PURUG 151204N 0510142E~~
	KUSOL 144009N 0501534E		~~KUSOL 144009N 0501534E~~
	NOTBO 142609N 0495530E		~~NOTBO 142609N 0495530E~~
	EMABI 141627N 0494139E		~~EMABI 141627N 0494139E~~
	SOKEM 134235N 0485329E		~~SOKEM 134235N 0485329E~~
	DATEG 123549N 0471627E		~~DATEG 123549N 0471627E~~
L570	ROTOX 283323N 0494809E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	AGHAJARI (AJR) 304441.1N 0494049.3E		
	IMKEN 314407N 0493611E		
	ALTAX 323014N 0492142E		
	NOTSA 331745N 0490315E		
L572	KAMISHLY (KML)	~~UL572~~	~~KAMISHLY (KML)~~
	LESRI 370420N 0411349~~9~~8E		~~LESRI 370420.3N 0411349.8E~~
	KAMISHLY (KML) 370~~1~~200N 041~~11~~2006E		~~KAMISHLY (KML) 370100N 0411106E~~
	HASSAKEH (HAS) 362900N 0404600E		~~HASSAKEH (HAS) 3629N 04045.3E~~
	DIER ZZOR (DRZ) 351~~7~~831N 040~~09~~1102E		~~DIER ZZOR (DRZ) 351731N 0400914E~~
	TANF (TAN) 332~~857~~900N 038391~~15~~20E		~~TANF (TAN) 332857N 0383915E~~
L573	DAFINAH (DFN) 231658N 0414310E	~~UL573~~	~~DAFINAH (DFN) 231658N 0414310E~~
	MADINAH (PMA) 243251N 0394219E		~~MADINAH (PMA) 243251N 0394219E~~
	WEJH (WEJ) 261045N 0362917E		~~WEJH (WEJ) 261045N 0362917E~~
L601	~~BAGLUM (BAG) 04004.12 0324838.6)~~	~~UL601~~	~~BAGLUM (BAG) 04004.12 0324838.6)~~
	~~*Note 7 (BAG-KTN)~~		~~*Note 7 (BAG-KTN)~~
	(ADANA (ADA) 365626.10N 0351237.40E)		~~ADANA (ADA) 365626.4N 0351237.6E (ADA)~~
	*Note 7 (ADA-KTN)		
	TUNLA 355300N 0360200E		~~TUNLA 3553.00N 0360200E)~~
	SALIM 352908N 0361847E		
	KARIATAIN (KTN) 341248N 0371551E		~~KARIATAIN 3412.48N 0371551.9E~~
L602	TUMAK 255031N 0531108E	~~UL602~~	~~TUMAK 255031N 0531108E~~
	*Note 7 (TUMAK-KTN)		
	VEDOM 260109N 0524456E		~~VEDOM 260109N 0524456E~~
	ORLUP 260651N 0523216E		
	VELAK 261307N 0521821E		~~VELAK 261307N 0521821E~~
	LABOP 261907N 0520429E		~~LABOP 261907N 0520429E~~
	ALTOM 262230N 0515639E		~~ALTOM 262230N 0515639E~~
	~~DASOS 262429N 0515043E~~BOPOV 262430N 0515043E		~~DASOS 262429N 0515043E~~
	ALMOK 262832N 0513840E		~~ALMOK 262832N 0513840E~~
	GITBO 263527N 0511750E		
	VEDOS 26410~~5~~6N 051004~~4~~5E		~~VEDOS 264105N 0510044E~~
	~~NABOS 264354N 0505145E~~		~~NABOS 264354N 0505145E~~
	~~MEMKO 264611N 0504427E~~		~~MEMKO 264611N 0504427E~~
	MOGAS 264~~759~~800N 0503909E		~~MOGAS 264759N 0503909E~~
	TOLMO 265504N 0502927E		~~TOLMO 265504N 0502927E~~
	EGLIT 27025~~5~~6N 050200~~5~~6E		~~EGLIT 270255N 0502005E~~
	TOKMA 27093~~8~~9N 0501159E		~~TOKMA 270938N 0501159E~~
	ORSOL 272135N 050020~~7~~8E		~~ORSOL 272135N 0500207E~~
	ITNAS 27464~~3~~4N 0493957E		~~ITNAS 274643N 0493957E~~
	~~ENAVI 275552N 0493151E~~		~~ENAVI 275552N 0493151E~~
	DAMUR 280137N 049263~~7~~8E		~~DAMUR 280137N 0492637E~~
	ITEVO 281558N 0491332E		
	DAVUS 282346N 0490622E		~~DAVUS 282346N 0490622E~~
	~~DARVA 284814N 0484734E~~BOXIK 284814N 0484734E		~~DARVA 284814N 0484734E~~
	~~ALVIX 2919185N 04824120E~~		~~ALVIX 291918N0482412E~~
	~~F~~RALKA 292611N 0481819E		~~FRALKA 292611N 0481819E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	TASMI 300120N 0475505E		~~TASMI 300120N 0475505E~~
	GADSI 303358N 0471116E		
	ALPET 311219N 0461844E		
	UROKO 314735N 0452917E		
	MUTLO 321019N 0445703E		
	LOVEK 322208N 0444001E		~~LOVEK3222086N 04440010E~~
	DELMI 33191~~1~~8N 0431~~731~~328E		~~DELMI331911N 0431731E~~
	ASNOT 333000N 0425717E		
	GEPAP 334906N 0422851E		~~ELEXI 344237N 0411054E~~
	DRZ 35173124N 04009141124~~E~~ELEXI 344~~237~~130N 041~~105~~40900E		~~DRZ 35173124N 04009141124E~~
	KUKSI 364508N 0374910E		~~KUKSI 364508N 0374910E~~
	GAZIANTEP (GAZ) 3657051N 03728234E		~~GAZIANTEP (GAZ) 3657051N 03728234E~~
L604	(PALEOCHORA (PLH) 351339.49N 0234051.04E)	~~UL604~~	~~PALEOCHORA (PLH) 351339N 0234051E~~
	SALUN 340000N 0242700E		~~SALUN 340000N 0242700E~~
	SIDI BARANI (BRN) 313432N 0260020E		~~SIDI BARANI (BRN) 3134320N 026002018E~~
	DANAD 285106N 0280609E		
	ALTAT 263602N 0294618E		
	EGPAR 261448N 0300148E		
	EL KHARGA (KHG) 252654N 03035274E		~~EL KHARGA (KHG) 252654N 03035274E~~
	KUNAK 252745N 0304112E		
	EMENA 253749N 0315147E		
	LUXOR (LXR) 254458 N 0324607E		~~LUXOR (LXR) 254458 N 0324607E~~
	ASRAB 254726N 0330619E		
	LORAS 255649N 0342714E		
	MOGAP 260055N 0350455E		
	IMRAD 260506N 0354444E		~~IMRAD 260506N 0354444E~~
	WEJH (WEJ) 2610~~4~~86N 036291~~8~~7E		~~WEJH(WEJ) 261048N 0362918E~~
	NADIK 261815N 0374637E		
	RABDA 262048N 0381440E		
	HALAIFA (HLF) 262603N 0391609E		~~HALAIFA (HLF) 2626030N 03916.096E~~
	MUPVI 262943N 0403437E		
	LAKRO 263051N 0410241E		
	DAXAP 262142N 0430228E		
	GASSIM (GAS) 26175~~4~~3N 043464~~8~~7E		~~GASSIM (GAS) 261754N 0434648E~~
	*Note 7 (GAS-~~KFA~~NARMI)		~~*Note 7 (GAS-KFA)~~
	NAGSA 261811N 0443117E		
	LABIS 261815N 0451755E		
	PUSLA 261758N 0461706E		~~PUSLA 261758N 0461706E~~
	~~*Note 8 to TOSNA~~		~~*Note 8 to TOSNA~~
	LOROX 261751N 0463021E		
	MAGALA (MGA) 261720N 0471225E		~~MAGALA (MGA) 26172018N 0471225 4 E~~
	~~ALMAL 261554N 0482106E~~MUSRI 261647N 0474137E		~~ALMAL 261554N 0482106E~~
	KASOM 262111N 0480312E		
	UMENA 262832N 0483952E		
	TABTA 262837N 0484325E		
	KING FAHD (KFA) 262~~153~~951N 0494~~910~~643E		~~KING FAHD (KFA) 2621534N 04949102E~~
	NARMI 261802N 0501939E		~~NARMI 261802N 0501939E~~
	BAHRAIN (BAH) 261551N 0503855E		~~BAHRAIN (BAH) 261551N 0503855E~~
	DENVO 260452N 0510509E		~~DENVO 260452N 0510509E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	PATOM 255821N 0511836E		~~PATOM 255821N 0511836E~~
	EMISA 254658N 0514207E		~~EMISA 254658N 0514207E~~
	KAPAX 254218N 0515118E		~~KAPAX 254218N 0515118E~~
	ORSIS 252801N 0521636E		~~ORSIS 252801N 0521636E~~
	ENANO 252348N 0522559E		~~ENANO 252348N 0522559E~~
	TOSNA 251612N 0524116E		~~TOSNA 251612N 0524116E~~
L607	(SITIA (SIT) 350406.32N 026112~~1~~0.63E)	~~UL607~~	~~SITIA (SIT) 350406N 0261121E~~
	*Note 7 (SIT-NABSI)		~~*Note 7~~
	PAXIS 335706N 0272000E		~~PAXIS 335706.1N02720.00E~~
	NABSI 314353N 0290419E		
	~~OTIKO 313421N 0293636E~~		~~OTIKO 313421.3N 02936.36E~~
	~~ALEXANDRIA (NOZ) 3111135N 02957013E~~		~~ALEXANDRIA (NOZ) 311113N 0295701E~~
L612	(SITIA (SIT) 350406.32N 0261120.63E)	~~UL612~~	~~KUMBI 334250N 0284500E~~ ~~LABNA 321956N 0301612E~~ ~~BALTIM (BLT) 313144N 0310721E~~
	*Note 7 (SIT-BLT)		
	KUMBI 334250N 0284500E		
	~~LABNA 321956N 0301612E~~MIVOR 322922N 0300603E		
	BAL TIM (BLT) 313144N 0310721E		
L613	~~EL DABA (DBA)~~ABU SIMBEL (SML) 222118N 0313719E	~~UL613~~	~~EL DABA (DBA)~~
	~~*Note 7~~EL KHARGA (KHG) 252654N 0303527E		~~*Note 7~~
	~~SOKAL 323601N 0273706E~~DEPNO 262438N 0301413E		~~SOKAL 3236.01N 027370620.0E~~
	BOPOS 264318N 0300722E		
	IMREK 290643N 291220E		
	KIVIL 293845N 0284415E		
	MERSA MATRUH (MMA) 311911N 0271320E		
	*Note 7 (MMA- AMAXI)		
	ITEXO 325832N 0265834E		
	TANSA 340000N 0264900E		~~TANSA 3400.00N 02649.00E~~
	(AMAXI 350552N 0254658E)		
L617	CAIRO (CVO) 300532N 0312318E		
	*Note 7 (CVO- SIT)		
	MENKU 310531N 0301806E		
	ALEXANDRIA (NOZ) 31111~~3~~5N 029570~~1~~3E	~~UL617~~	~~ALEXANDRIA NOZ 311113N 0295701E~~
	~~IMRUT 313259N 0293346E~~SOBAX 313508N 0291835E		~~IMRUT 313259N 0293346E~~
	~~ASNIR 323849N 0282144E~~NABSI 314353N 0290419E		~~ASNIR 323849N 0282144E~~
	TANSA 340000N 0264900E		~~TANSA 340000N 0264900E~~
	(SITIA (SIT) 350406.32N 0261120.63E)		
L620	(ALSUS 350206N 0343924E)		
	BALMA 342856.30N 0350302.30E	~~UL620~~	~~BALMA 342856N 0350302E~~
	KALDE (KAD) 33482~~7~~6.70N 03529~~10~~09.53E		~~KALDE (KAD) 334827N 0352910E~~
L631	TOTOX 215030N0622230E	~~UL631~~	~~TOTOX 215030N0622230E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	*Note 7 (TOTOX-MCT)		
	IVOMA 223408N 0605430E		~~IVOMA 223408N 0605430E~~
	~~*Note 7 (OO)~~DEBDA 224327N 0603525E		~~*Note 7 (OO)~~
	MIBSA 225400N 0601338E		~~MIBSA 225400N 0601338E~~
	AMBOS 230324N 0595405E		~~AMBOS 230324N 0595405E~~
	ELIGO 232458N 0590848E		~~ELIGO 232458N 0590848E~~
	KARAR 233042N 0585438E		~~KARAR 233042N 0585438E~~
	MUSCAT (MCT) 233528.04N 0581536.48E		~~MUSCAT (MCT) 233528.01N 0581536E.47~~
L677	CAIRO (CVO) 300532N 0312318E	~~UL677~~	~~CAIRO (CVAIRO) 300532.5N 0312318.3E~~ ~~MENLI 2947.00N 0315206.1E~~ ~~KAPIT 2917.0N 03236.1E~~ ~~SHARM EL SHEIKH (SHM) 275953N 0342448E~~ ~~PASAM 273045.8N 0345542.7E~~ ~~*Note 7(OE)~~ ~~WEJH (WEJ) 261046.8N 0362917.3E~~ ~~MUVAT 253755.9N 0365446.8E~~ ~~YENBO (YEN) 2408.58N 03802193.9E~~ ~~KING ABDULAZIZ (JDW) 214244N 0390723E~~ ~~QUNFIDAH (QUN) 192211.2N 0410429.5E~~ ~~TALIB 183854.9N 0413114.2E~~ ~~JAZAN (GIZ) 165428.5N 0423439.7E~~ ~~NABAN 163124.4N 043014.8E~~ ~~IMSIL 155738.6N 04313.12E~~ ~~SANAA (SAA) 1530.00N 0441311.2E~~
	MENLI 294700N 0315206E		
	KAPIT 291700N 0323606E		
	SHARM EL SHIEKH (SHM) 275953N 0342448E		
	*Note 7 (PASAM-SHM)		
	PASAM 273045N 0345542E		
	DARAX 264713N 0354703E		
	WEJH (WEJ) 261046N 0362917E		
	*Note 7 (PASAM-JDW)		
	RAGNO 251617N 0371123E		
	YENBO (YEN) 240858N 0380219E		
	RIDEP 233847N 0381558E		
	MIGDA 223829N 0384253E		
	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E		
	*Note 7 (JDW-ABKAR)		
	RIBAM 204231N 0390551E		
	PATUS 192945N 0393720E		
	ABKAR 190511N 0401612E		
	IMRAM 175604N 0413004E		
	LUBAL 171544N 0421228E		
	JAZAN (GIZ) 165428N 0423439E		
	*Note 7 (GIZ-IMSIL)		
	NABAN 163123N 0430150E		
	IMSIL 155738N 0434112E		
	SANAA (SAA) 152959.60N 0441310.60E		
L681	GESOR 270322N 0475751E	~~UL681~~	~~EGNOV 270301N 0474713E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	*Note 5 & 7 & 8 ~~to~~ (~~EGNOV~~GESOR-~~SALWA~~ULIKA)		~~*Note 5 & 7 & 8 to (EGNOV SALWA)~~
	~~GEPAK 2633.00N 0484328.5E~~LABLI 264522N 0482100E		~~GEPAK 2633.00N 0484328.5E~~
	~~RADMA 2623.0N 04857.5E~~RABSA 263050N 0483951E		~~RADMA 2623.0N 04857.5E~~
	~~DELMU 2618.9N 04903.4E~~TABTA 262837N 0484325E		~~DELMU 2618.9N 04903.4E~~
	~~ROSEM 2607.7N 04919.0E~~EMOGA 261647N 0490230E		~~ROSEM 2607.7N 04919.0E~~
	~~SALWA 251538N 0503048E~~BOSIV 261258N 0490837E		~~SALWA 251538N 0503048E~~
	DEMKA 261008N 0491310E		
	GISRA 253344N 0501047E		
	ULIKA 251545N 0503849E		
L692	ALRIK 220631N 0482535E		
	*Note 7 (ALRIK-GISKA)		
	LOTOS 220000N 0503912E		
	DEBEP 215700N 0514434E		
	VATIX 215522N 0521638E		
	ALROK 215400N 0524217E		
	DEBIN 214716N 0543309E		
	KOBES 214504N 0550526E		
	DAPOL 214301N 0553416E		
	EMAVA 214208N 0554936E		
	ITSAG 213720N 0570640E		
	GISKA 213503N 0574014E		
L695	PAROK 231030N 0590245E	~~UL695~~	~~PAROK 231030N 0590245E~~
	*Note 7 (~~OO~~PAROK-ITURA)		~~*Note 7 (OO)~~
	ITURA 232351N 0580720E		~~ITURA 232351N 0580720E~~
L703	LONOS 283027N 0491713E		
	LOPOL 281850N 0492845E		
	GEPUT 281307N 0493423E		
	GODRI 280257N 0494308E		
	GOGRA 274918N 0495344E		
	OBNAX 272651N 0501103E		
	DEKTA 271605N 0501946E		
	VELOG 270215N 0503056E		
	KOBOK 265839N 0503349E		
	RIKET 261952N 0510954E		
	RASDI 260425N 0512407E		
~~Y604~~ L704	LONOS 283027N 0491713E		
	*Note 7 (LONOS-TOSNA)		
	LOPOL 281850N 0492845E		
	GEPUT 281307N 0493423E		
	GODRI 280257N 0494308E		
	GOGRA 274918N 0495344E		
	OBNAX 272651N 0501103E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DEKTA 271605N 0501946E		
	VELOG 270215N 0503056E		
	KOBOK 265839N 0503349E		
	DEBEN 265254N 0504856E		
	DAVRI 264936N 0505732E		
	SODAK 264634N 0510530E		
	DANOB 263946N 0512640E		
	BOTOB 263350N 0514505E		
	VEDED 260558N 0514628E		
	ORSIS 252801N 0521636E		
	ENANO 252348N 0522559E		
	TOSNA 251612N 0524116E		
L710	UKRAG 233056N 0552306E		
	*Note 7 (UKRAG to DEDSO)		
	MEMTU 232517N 0552443E		
	GOGMI 230215N 0553159E		
	ITKUN 223731N 0553934E		
	DEBAV 221532N 0554617E		
	EMAVA 214208N 0554936E		
	ITETA 211618N 0555208E		
	IVENI 205158N 0555430E		
	KASIN 201853N 0555742E		
	KEDON 200503N 0555901E		
	KUKDI 193022N 0555953E		
	DEDSO 185811N 0560041E		
~~Q13~~ L713	DASHT E NAZ (DNZ) 363853.6N 0531120.1E		
	IMDUX 361511N 0534211E		
	GIBAB 353213N 0543656E		
	PAXER 350901N 0550000E		
	ULETA 342805N 0554002E		
	EMITI 335811N 0560845E		
	RIBEN 332902N 0563620E		
	OTISO 331451N 331451N		
	EGPOD 324901N 0571545E		
	NADSA 321438N 0575002E		
	TOVUS 300643N 0595235E		
	ULOVI 291948N 291948N		
	SODOK 281113N 0613652E		
	KEBUD 273552N 0625024E		
L721	LAVAN ISLAND (LVA) 264843.4N 0532121.1E		
	EGMIT 263340N 0530825E		
	IMLUV 262936N 0530101E		
	ELIDU 262424N 0525133E		
	*Note 7 (ELIDU-BAYAN)		
	UKNEP 262127N 0524818E		
	UKUBU 261428N 0524039E		
	ORLUP 260651N 0523216E		
	ITMUB 255919N 0522402E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	ALKAN 255214N 0521615E		
	SENKI 254637N 0520928E		
	LABOV 253412N 0515521E		
	BAYAN 252926N 0514849E		
L764	MUSCAT (MCT) 233528N 0581536E	~~UL764~~	~~MUSCAT (MCT) 233528N 0581536E~~
	ALMOG 233524N 0574940E		~~ALMOG 233524N 0574940E~~
	IVETO 233520N 0570704E		~~IVETO 233520N 0570704E~~
	PAXIM 240245N 0561631E		~~PAXIM 240245N 0561631E~~
L768	ALPOB 254218N 0530055E	~~UL768~~	~~ALPOB 254218N 0530055E~~
	*Note 7 (ALPOB to FIRAS)		~~*Note 7 to FIRAS~~
	*Note 8 (ALPOB-COPPI)		~~*Note 8 (ALPOB-COPPI)~~
	ROTAG 255353N 0523621E		~~ROTAG 255353N 0523621E~~
	~~SOLEG 260159N 0521756E~~ITMUB 255919N 0522402E		~~SOLEG 260159N 0521756E~~
	MODOG 261012N 0515935E		~~MODOG 261012N 0515935E~~
	RAMKI 261138N 0515625E		~~RAMKI 261138N 0515625E~~
	RABLA 261506N 0514834E		~~RABLA 261506N 0514834E~~
	SOLOB 262241N 0513132E		~~SOLOB 262241N 0513132E~~
	ALREP 262541N 0512209E		
	ORDIG 262738N 0511603E		
	MEDMA 263421N 0505454E		~~MEDMA 263421N 0505454E~~
	~~TOTLA 263806N 0504301E~~OBMON 263832N 0504125E		~~TOTLA 263806N 0504301E~~
	EGMOR 264211N 0502907E		~~EGMOR 264211N 0502907E~~
	ULADA 264527N 0501624E		~~ULADA 264527N 0501624E~~
	ITESA 265016N 0500014E		
	JUBAIL (JBL) 270~~222~~043N 049242~~26~~43E		~~JUBAIL (JBL) 270222N 0492426E~~
	LAKSI 271306N 0490004E		
	ITUDA 273432N 0481647E		
	IVOBA 274138N 0480219E		
	COPPI 275033N 0474359E		~~COPPI 275033N 0474359E~~
	DUSBO 280616N 0465254E		
	AL QAISUMAH/HAFR AL BATIN (HFR) 28~~1950~~2126N 046074~~46~~03E		~~HFR 281950N 0460746E~~
	VATIM 285136N 0444443E		~~VATIM 285136N 04444432E~~
	RAFHA (RAF) 2~~81950~~93713N 04~~60746~~32953E		~~RAFHA (RAF) 281950N 0460746E~~
	ARAR (AAR) 305429N 0410832E		~~ARAR (AAR) 305429N 0410832E~~
	OVANO 314801N 0390951E		~~OVANO 314801N 0390951E~~
	OTILA 320131N 0390153E		~~OTILA 320131N 0390153E~~
	MODAD 323542N 0384136E		~~MODAD 323542N 0384136E~~
	KUMLO 325811.82N 0384138.14E		
	SOKAN 330806N 0382206E		~~SOKAN 330806N 0382206E~~
	RAFIF 33124~~8~~7N 038191~~8~~9E		~~RAFIF 331248N 0381918E~~
	SULAF 332718N 038102~~4~~7E		~~SULAF 332718N 0381024E~~
	FIRAS 335218N 0375512E		~~FIRAS 335218N 0375512E~~
L852	UROMIYEH (UMH) 374114.0N 0450503.7E		
	TESVA 381709N 0442947E		
	(ESENK 384441.40N 425616.80E)		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
L883	REXOD 211230N 0613830E	~~UL883~~	~~REXOD 211230N 0613830E~~
	GADMA 211439N 0600938E		~~GADMA 211439N 0600938E~~
	TAVKO 211519N 0593147E		~~TAVKO 211519N 0593147E~~
	UMILA 211555N 0584738E		~~UMILA 211555N 0584738E~~
	*Note 7 (UMILA to ALNUG)		
	MEVLI 211632N 0565606E		~~MEVLI 211632N 0565606E~~
	KUROV 211627N 0561853E		~~KUROV 211627N 0561853E~~
	ALNUN 211625N 0561041E		~~ALNUN 211625N 0561041E~~
	ITETA N211618 E0555208		
	SITOL 211604N 0552514E		~~SITOL 211604N 0552514E~~
	LONOV 211856N 0543516E		
	DASAP 212047N 0540045E		
	EGSAB 212446N 0523634E		
	~~PURDA 210805N 0510329E~~ASNUR 212654N 0514335E		~~PURDA 210805N 0510329E~~
	EGSIT 212746N 0511956E		
	ALNUG 213009N 0500453E		
	*Note 7 (ALRIK to ALNUG)		~~ALRIK 220631N 0482535E~~
	ALRIK 220631N 0482535E		
	KITUB 224922N 0462342E		
	UMRAN 231508N 0452023E		~~UMRAN 231508.1N 0452023.4E~~
	*Note 7 (PMA to URMAN)		
	DASTO 232236N 0445953E		
	NADLI 233725N 0441843E		
	TUKVU 234626N 0435319E		~~TUKVU 234626.4N 0435319.3E~~
	KODIS 240254N 0425312E		
	BIR DARB (BDB) 241951N 0414928E		~~BIR DARB (BDB)~~
	GOKSA 242442N 0410403E		
	MEDRO 242730N 0403649E		
	MADINAH (PMA) 243251N 0394219E		~~MADINAH (PMA) 243251N 0394219E~~
L934	PATOM 255821N 0511836E		
	LUBET 261441N 0510347E		
	EGPUD 262904N 0505019E		
	OBMON 263832N 0504125E		
	OVUPI 265320N 0502727E		
	TOKMA 270939N 0501159E		
	ORSOL 272135N 0500208E		
	ITNAS 274644N 0493957E		
	DAMUR 280137N 0492638E		
	ITEVO 281558N 0491332E		
	DAVUS 282346N 0490622E		
M203	PUSTO 332100N 0424500E	~~UM203~~	~~PUSTO 3321.00N 04245.00E~~
	*Note 7 (PUSTO to ILMAP)		
	SILBO 325900N 0432900E		
	LOVEK 322208N 0444001E		~~LOVEK 322208.1N 04440.01E~~
	KODAV 314500N 0460400E		
	ILMAP 312133N 0465702E		~~ILMAP 312133N 0465702E~~
M300	~~(CALICUT) CLC 110806N 0755717E~~(KADOL 190003N 0633602E)	~~UM300~~	~~(CALICUT) CLC 110806N 0755717E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	LOTAV 203700N 0605700E		~~LOTAV 203700N 0605700E~~
	GADMA 211439N 0600938E		
	GOLBA 213318N 0594600E		
	EMURU 221~~535~~357N 058~~4950~~5338E		~~EMURU 221535N 0584950E~~
M301	(PURAD 145500N 0415354E)	~~M301~~	~~PURAD 145500N 0415354E~~
	KIPAM 150030N 0421526E		
	MIPIN 150608N 0423735E		
	LUDOX 152034N 0433524E		
	MUTEX 152524N 0435445E		
	SANAA (SAA) 15~~3000~~295960N 044131~~1~~0.60E		~~SANAA (SAA) 153000N 0441311E~~
	ITOLI 152825N 0450927E		~~ITOLI 152825N 0450927E~~
	PASAD 153634N 0460713E		
	PAPOR 154322N 0465652E		
	GIBIT 154849N 0473804E		
	NABUP 155417N 0482143E		
	SAYUN (SYN) 155742.64N 0484710.18		
	XAGAG 160206N 0492722E		
	GINBO 160349N 0494017E		
	RARBA 161021N 0503920E		
	SIMKO 161821N 0515526E		
	ASMAK 162327N 0524634E		~~ASMAK162327N 0524634E~~
M303	MUSCAT (MCT) 233528.04N 0581536.48E	~~UM303~~	~~MUSCAT (MCT) 233528.01N 0581536E.47~~
	*Note 7 (~~OO~~MCT-KIPOL)		~~*Note 7 (OO)~~
	SEVLA 233321N 0591122E		~~SEVLA 233321N 0591122E~~
	KIPOL 230410N 0612903E		~~KIPOL230410N 0612903E~~
M305	SIDI BARANI (BRN) 313432.5N 0260020.3E	~~UM305~~	~~SIDI BARANI (BRN) 313432.5N 0260020.3E~~
	ATMUL 200000N 290527.4E		~~ATMUL 200000N 290527.4E~~
	*Note 3		~~*Note 3~~
M309	KING KHALED (KIA) 245310N 0464534E	~~UM309~~	~~KINGD KHALED (KIA) 245310N 0464534E~~
	*Note 1 (KIA-VEMEM)		~~*Note 1 (KIA-VEMEM)~~
	DURMA 242710N 0454610E		
	RAGHBA (RGB) 235533N 0443547E		~~RAGHBA (RGB) 235533N 0443547E~~
	LAKMI 232424N 0430827E		
	DIPEX 231656N 0424758E		
	KUTOL 230718N 0422147E		
	ITOLO 224602N 0412244E		
	ALPUT 224019N 0410705E		
	VUTEX 223418N 0405044E		
	VEMEM 221554N 0400118E		~~VEMEM 221554N 0400118E~~
	~~RABTO 221608N 0400326E~~		~~RABTO 221608N 0400326E~~
M312	EL DABA (DBA) 310041N 0282801E	~~UM312~~	~~EL DABA (DBA) 310041.7N 0282801.0E~~
	AMIBO 345640N 213627E		~~AMIBO 345640.7N 213627.4E~~
	*Note 3 (HE)		*Note 3 (HE)
M316	KANAS 251552N 0574700EKATUS 251600N 0574700E	~~UM316~~	~~KANAS 251552N 0574700E~~
	SEVDA 260217N 0590549E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	NAGES 262451N 0594514E		
	SOLUV 264157N 0601533E		
	GOKSO 265542N 0604012E		~~GOKSO 265542N 0604012E~~
M317	GABKO 260404N 0554755E		
	RADEB 261140N 0554719E		
	NANPA 262301N 0553136E		
	ORPEN 263119N 0552008E		
	SERDU 264715N 0545757E		
	ROTAL 273241N 0535320E		
	KUPTO 282418N 0525432E		
	IMGOD 301419N 0513050E		
	RADID 302444N 0512613E		
	NOTSA 331745N 0490315E		
	KEBEP 350454N 0474014E		
	PAREX 360527N 0465154E		
	RABEM 374841N 0452949E		
M318	RIKOP 374026N 0581450E		
	*Note 7 (ATUDO-RIKOP)		
	SILPO 370806N 0580006E		
	BONEM 363826N 0574647E		
	SABZEVAR (SBZ) 361011.0N 0573414.9E		
	RABAM 355442N 0572955E		
	SITEL 351304N 0571825E		
	DAPIN 342034N 0570413E		
	TABAS (TBS) 334021.2N 0565330.9E		
	OTISO 331451N 0564936E		
	IMSOG 325636N 0564649E		
	NIVRA 315905N 0563810E		
	PARID 313041N 0563358E		
	MIRER 305943N 0562926E		
	GETIS 301145N 0562226E		
	ASMET 284758N 0561019E		
	ASMUK 280952N 0560453E		
	GHESHM ISLAND (KHM) 264547.1N 0555427.6E		
	RADEB 261140N 0554719E		
	GABKO 260404N 0554755E	~~UM318~~	
	~~GITSA 254132N 0553926E~~DAVMO 255127.0N 0553900.0E		
	~~*Note 7 (SERSA-GABKO) Eastbound~~TOVIV 253302N 0551942E		
	~~SERSA 251945N 0553118E~~LOVEM 252645.4N 0551440.4E		
	~~MIADA 245112N 0545736E~~MITIX 251746.4N 0550729.7E		
	~~ABU DHABI (ADV) 242508N 0544024E~~EGTAG 250856N 0545652E		
	~~ATUDO 241708N 0543532E~~VEKOV 245750N 0544925E		
	~~MUSEN 241429N 0543336E~~TULON 245511.4N 0544739.1E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	~~GOLGU 231051N 0523109E~~KUVDA 244309N 0543909E		
	~~MUXIT 230229N 0523024E~~IMLIP 243648N 0543549E		
	~~KITAP 224928N 0522923E~~RURAL 243045N 0543156E		~~KITAP 224928N 0522923E~~
	~~PURDA 210805N 0510329E~~ATUDO 241708.0N 0543432.0E		~~PURDA 210805N 0510329E~~
	~~SHARURAH (SHA) 172813N 0470802E~~MUSEN 241429N 0543236E		~~SHARURAH (SHA) 172813N 0470802E~~
	~~NADKI 171418N 0464706E~~BOPIT 235947N 0540404E		~~NADKI 171418N 0464706E~~
	~~SANAA (SAA) 153100N 0441311E~~DANOK 234220N 0533111E		~~SANAA (SAA) 153100N 0441311E~~
	~~HODEIDAH (HDH) 144622N 0425911E~~ESROM 232424N 0525729E		~~HODEIDAH (HDH) 144622N 0425911E~~
	GOLGU 231051N 0523109E		
	MUXIT 230229N 0523024E		
	KATIT 224928N 0522923E		
	MEDPO 222421N 0520751E		
	DEGPA 221801N 0520227E		
	DEBEP 215700N 0514434E		
	EGSIT 212746N 0511956E		
	PURDA 210805N 0510329E		
	ASTIN 200410N 0495320E		
	KUTMA 182927N 0481202E		
	NITPO 174554N 0472624E		
	SHARURAH (SHA) 172813N 0470802E		
	NADKI 171417N 0464703E		
	RAGNI 163454N 0454815E		
	IMDEN 162101N 0452744E		
	MUTAB 155314N 0444700E		
	RAKID 154134N 0442959E		
	SANAA (SAA) 152959.60N 0441310.60		
	NAGIL 152024N 0435651E		
	RAMLO 151033N 0434007E		
	HODEIDEH (HDH) 144622.10N 0425911.10E		
M319	ULINA 292451N 034581~~7~~8E	~~UM319~~	~~ULINA 292451N 0345817E~~
	SESMO 293458N 0351159E		~~SESMO 293458N 0351159E~~
	LOXUS 301301N 0352601E		~~LOXUS 301301N 0352601E~~
	LOSIL 304951N 0354841E		~~LOSIL 304951N 0354841E~~
	QATRANEH (QTR) 311454N 0360334E		~~QATRANEH (QTR) 311454N 0360334E~~
	MOUAB 314758.00N 0353559.00E		
M320	KING FAHD (KFA) 262153N 0494910E	~~UM320~~	~~KING FAHD (KFA) 262153N 0494910E~~
	KODAG 2703.3N 04920.4E JUBAIL (JBL) 270222N 0492426E		~~KODAG 2703.3N 04920.4E~~ ~~JUBAIL (JBL) 270222N 0492426E~~
	RAS MISHAB (RAS) 280441N 0483653E		~~RAS MISHAB (RAS) 280441N 0483653E~~
	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E		~~KUWAIT (KUA) 291306N 0475803E~~
M321	HALAIFA (HLF) 26260~~2~~3N 0391609E	~~UM321~~	~~HALAIFA (HLF) 262602N 0391609E (HLF)~~
	*Note 7 (KIA-HLF)		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	IMROV 260936N 0402145E		
	ORMAD 260353N 0404401E		
	ROSUL 253945N 0421519E		~~ROSUL 253945.7N 0421519.3E~~
	KINOB 253146N 0430018E		
	MIRAS 251508N 0443001E		
	OVEKU 250955 0445701E		~~OVEKU 250955.9 04457.01E~~
	IVONU 250323N 0454030E		
	KING KHALED (KIA) 245310N 0464534E ~~RESAL 240649N 0470427E~~ ~~AMBAG 230529N 0474611E~~ ~~ALRIK 220631N 0482525E~~ ~~NONGA 205048N 0492014E~~ ~~ASTIN 200410N 0495320E~~ ~~SILPA 184953N 0510158E~~ ~~IMPOS 183136N 0511848E~~ ~~LOTEL 180926N 0514103E~~ ~~PUTRA 165432N 0525631E~~		~~KING KHALED (KIA) 245310N 0464534E~~ ~~RESAL 240649N 0470427E~~ ~~AMBAG 230529N 0474611E~~ ~~ALRIK 220631N 0482525E~~ ~~NONGA 205048N 0492014E~~ ~~ASTIN 200410N 0495320E~~ ~~SILPA 184953N 0510158E~~ ~~IMPOS 183136N 0511848E~~ ~~LOTEL 180926N 0514103E~~ ~~PUTRA 165432N 0525631E~~
	RESAL 240649N 0470427E		
	AMBAG 230529N 0474611E		
	BOSOB 224130N 0480218E		
	ALRIK 220631N 0482535E		
	DAXOK 213157N 0485041E		
	NONGA 205048N 0492014E		
	ASTIN 200410N 0495320E		
	SILPA 184953N 0510158E		
	IMPOS 18313~~6~~7N 0511848		
	LOTEL 180926N 0514103		
	PUTRA 165432N 0525631E		
~~M320~~ M323	IMDUR 074114N 0323107E		
	BOTOK 102859N 0334548E		
	EGTOT 144511N 0353913E		
	MIPOL 203322N 0382145E		
M324	RIKOP 374026N 0581450E		
	LOXED 355854N 0580609E		
	TABNI 353052N 0575840E		
	TASLU 342531N 342531N		
	ROXEK 331123N 0572138E		
	EGPOD 324901N 324901N		
	DARBAND (DAR) 314659.4N 0565940.4E		
	PURBO 311346N 0565832E		
	KERMAN (KER) 301658.1N 0565632.3E		
	NANTO 284140N 0563831E		
	BANDAR ABBAS (BND) 271149.4N 0562200.3E		
	MOBET 264406N 0560908E		
	PATAT 261613N 0560059E		
M425	ELIKA 334955N 0343500E	~~UM425~~	~~SILKO ELIKA 3349557.9N 03435.00E~~
	CHEKA (CAK) 34180~~2~~1.81N 0354~~200~~159.64E		~~CHEKA (CAK) 341802N 0354200E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
M428	~~RIKET 251859N 0560200E~~IVURO 251940N 0560915E	~~UM428~~	~~RIKET 251859N 0560200E~~
	*Note 7/8 (~~OO~~IVURO/~~OM~~MUNGA)		~~*Note 7/8 (OO/OM)~~
	SUTVO 251531N 0562153E		
	GOMTA 251115N 0563447E		~~GOMTA 251115N 0563447E~~
	TARBO 244351N 0574637E		~~TARBO 244351N 0574637E~~
	MUNGA 242516N 0584533E		~~MUNGA 242516N 0584533E~~
M430	KING KHALID (KIA) 245310N 0464534E	~~UM430~~	~~*Note 5 (KIA-DOH)~~
	*Note 5 (KIA-DOH)		~~KING KHALID (KIA) 245310N 0464534E~~
	*Note 7 (ULIKA-KIA)		
	DEGLA 250243N 0472847E		
	KOBOX 250716N 0475046E		~~KOBOX 250716N 0475046E~~
	GOLNO 251155N 0483658E		
	KIREN 251447N 0490724E		~~KIREN 251447N 0490724E~~
	*Note 8 (KIREN-TOSNA)		~~*Note 8 (KIREN-TOSNA)~~
	AL AHSA (~~HAS~~HSA) 251645N 0492903E		~~AL AHSA (HAS) 251645N 0492903E~~
	SALWA 251538N 0503048E		~~SALWA 251538N 0503048E~~
	ULIKA 251545N 0503849E		~~ULIKA 251545N 0503849E~~
	GINTO 251606N 0510416E		~~GINTO 251606N 0510416E~~
	LAGNO 251613N 0511518E		~~LAGNO 251613N 0511518E~~
	DOHA/HAMAD ~~INTL~~ (DOH) 251459.66N 051363~~5~~4.80E		~~DOHA HAMAD INTL (DOH) 251459N 0513635E~~
	*Note 7 (OXARI-DOH)		
	BOVIP 251555N 0523135E		~~BOVIP 251555N 0523135E~~
	TOSNA 251612N 0524116E		~~TOSNA 251612N 0524116E~~
	~~*Note 7 (DOH-KISAG)~~PUTIB 251900N 0525755E		~~*Note 7 (DOH-KISAG)~~
	~~KISAG 251834N 0541408E~~RORON 252053N 0530916E		~~KISAG 251834N 0541408E~~
	TAGDU 252258N 0532153E		
	OXARI 252535N 0533458E		
M434	UMESA 351741N 0434307E ~~OTALO 351700N 0441900E~~ ~~IVANO 351724N 0451235E~~ ~~BOXIX 351724N 0460921E~~ ~~ALSAX 351607N 0463118E~~ ~~SANANDAJ (SNJ) 351420N 0470028E~~ ~~HAMDAN(HAM) 345201N 0483301E~~ ~~SAVEH(SAV) 350107N 0502217E~~	~~UM434~~	~~UMESA 351741N 0434307E~~ ~~OTALO 351700N 0441900E~~ ~~IVANO 351724N 0451235E~~ ~~BOXIX 351724N 0460921E~~ ~~ALSAX 351607N 0463118E~~ ~~SANANDAJ (SNJ) 351420N 0470028E~~ ~~HAMDAN(HAM) 345201N 0483301E~~ ~~SAVEH(SAV) 350107N 0502217E~~
	OTALO 351700N 0441900E		
	TOTAM 351601N 0444006E		
	DAVAS 351724N 0451235E		
~~W136~~	BOXIX 351724N 0460921E		
	ASLAX 351607N 0463118E		
	NOLTO 351435N 0465623E		
	SANANDAJ (SNJ) 351419.7N 0470029.2E		
	TUKLO 351014N 0471751E		
	LOVID 350740N 0472841E		
	KEBEP 350454N 0474014E		
	HAMADAN (HAM) 345200.8N 0483301.0E		
	ORLOG 345512N 0490915E		
	SAVEH (SAV) 350106.8N 0502216.9E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
M440	KING KHALED (KIA) 245310N 0464534E	~~UM440~~	~~KING KHALED (KIA) 245310N 0464534E~~
	~~OTAMA 235148N 0494707E~~OTALI 243313N 0474744E		~~OTAMA 235148N 0494707E~~
	SITER 241107N 0485443E		
	KUTNA 231341N 0512730E		~~KUTNA 231341N 0512730E~~
	BOPEK 230059N 0520007E		
	~~KITAP 224928N 0522923E~~KATIT 224928N 0522923E		~~KITAP 224928N 0522923E~~
	*Note 7 (KATIT-TULBU)		
	DAVLU 224136N 0533310E		~~TOKRA 220925N 0553350E~~
	DANUX 223605N 0541558E		
	MIDGU 222706N 0552230E		
	DEMKI 224941N 0562308E		
	TULBU 230005N 0571827E		
M444	DOHA/HAMAD ~~INTL~~(DOH) 251459.66N 0513635~~5~~4.80E	~~UM444~~	~~DOHA/ HAMAD INTL (DOH) 251459N 0513635E~~
	EMISA 254658N 0514207E		~~EMISA 254658N 0514207E~~
	PATOM 255821N 0511836E		~~PATOM 255821N 0511836E~~
	DENVO 260452N 0510509E		~~DENVO 260452N 0510509E~~
	TULUB 260644N 0510041E		
	BAHRAIN (B~~A~~HR) 2615~~51~~130N 0503~~855~~919E		~~BAHRAIN (BAH) 261551N 0503855E~~
	ELOSO 262409N 050355~~0~~1E		~~ELOSO 262409N 0503550E~~
	DESBU 263240N 0503241E		
	EGMOR 26421~~0~~1N 050290~~6~~7E		~~EGMOR 264210N 0502906E~~
	LOTOR 264854N 0502200E		~~LOTOR 264854N 0502200E~~
	*Note 7 (LOTOR- DAVUS)		
	RAMSI 270249N 0500714E		~~RAMSI 270249N 0500714E~~
	ORDAN 271706N 0495442E		~~ORDAN 271706N 0495442E~~
	GIRSI 274126N 049331~~0~~1E		~~GIRSI 274126N 0493310E~~
	ENASO 27570~~6~~7N 0491911E		~~ENASO 275706N 0491911E~~
	EMORI 281434N 0491051E		
	DAVUS 282346N 0490622E		~~DAVUS 282346N 0490622E~~
M449	BUSRA 322000N 0363700E	~~UM449~~	~~BUSRA 322000N 0363700E~~
	~~MUNRA MAZAR 3049448.0N 036083510.0E~~GIBOX 320700N 0363308E		~~MUNRA MAZAR 3049448.0N 036083510.0E~~
	~~GIBET 292620.3N 03625.01E~~MESLO 320231N 0363148E		~~GIBET 292620.3N 03625.01E~~
	~~TABUK (TBK) 282153N 0363637E~~GETUP 315833.47N 0363037.47E		~~TABUK (TBK) 282153N 0363637E~~
	~~WEJH (WEJ) 261046N 0362918E~~ALNOR 313955.26N 0362507.52E		~~WEJH (WEJ) 261046N 0362918E~~
	EGLOT 311656.94N 0361823.86E		
	MUNRA 304944.29N 0360835~~5~~4.88E		
	KINOD 301200.30N 0361600.60E		
	PETRA 294206N 0362210E		
	GIBET 292620N0362501E		
	EGSIS 290515N 0362850E		
	RABUG 283622N 0363402E		
	TABUK (TBK) 282153N 0363637E		
	NETOL 270748N 0363226E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	WEJH (WEJ) 261046N 0362917E		
M550	GOLGU 231051N 0523109E	~~UM550~~	~~GOLGU 231051N 0523109E~~
	RIBOT 230844N 0522428E		~~RIBOT 230844N 0522428E~~
	BOPEK 230059N 0520007E		~~BOPEK 230059N 0520007E~~
	MIGMA 225035N 0512749E		~~MIGMA 225035N 0512749E~~
	*Note 7 (MIGMA- MEVDO)		
	MEVDO 223205N 0494616E		~~MEVDO 223205N 0494616E~~
M551	~~KIVEL 165306N 0553633E~~(DONSA 143518N 0651136E)	~~UM551~~	~~DONSA143518.3N0651136344.0E~~
	~~DAXAM 171612N 0544715E~~ANGAL 161404N 0600004E		~~ANGAL161404.1N 0600004.1E~~
	OTOTO 164004N 0570435E		~~OTOTO 164004N 0570435E~~
	KIVEL 165306N 0553633E		~~KIVEL 165306N 0553633E~~
	DAXAM 171612N 0544715E		~~DAXAM 171612N 0544715E~~
M554	TOKAR 180624N 0374812E		
	MIPOL 203322N 0382145E		
~~J5~~ M555	ALRAM 374230N 0443736E		
	KAPES 372520N 0452004E		
~~Y856~~ M556	ORMID 253354N 0525434E		
	DASLO 254537N 0523029E		
	ALKAN 255214N 0521615E		
	RABLA 261506N 0514834E		
	SOLOB 262241N 0513132E		
	ALREP 262541N 0512209E		
	ORDIG 262738N 0511603E		
	MEDMA 263421N 0505454E		
	BAHRAIN (BHR) 261530N 0503919E		
	NARMI 261802N 0501939E		
M557	~~ATBOR 251007N 0551947E~~IVOXI 251239.6N 0552513.1E	~~UM557~~	~~ATBOR 251007N 0551947E~~
	~~*Note 7 & 8 (ATBOR-VUVOK) to MIDSI~~MITIX 251746.4N 0550729.7E		~~*Note 7 & 8 (ATBOR-VUVOK) to MIDSI~~
	~~NADIL 252252N 0544717E~~RIDAP 252553.7N 0543701.2E		~~NADIL 252252N 0544717E~~
	~~NABOP 252607N 0540405E~~OTIKI 253229N 0541441E		~~NABOP 252607N 0540405E~~
	~~EMAGO 253456N 0535751E~~TOTKU 253534N 0540410E		~~EMAGO 253456N 0535751E~~
	~~VUVOK 254408N 0533024E~~GODKI 254122N 0534347E		~~VUVOK 254408N 0533024E~~
	RALMI 254505N 0533033E		
	TUMAK 255031N 0531108E		
M559	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E		
	*Note 7 (JDW- LABNI)		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	RIBAM 204231N 0390551E		
	PATUS 192945N 0393720E		
	IMLIL 171949N 0403219E		
	LABNI 165620N 0410921E	~~UM559~~	~~LABNI 165620N 0410921E~~
	NISMI 162415N 0421838E		~~NISMI 162415N 0421838E~~
	DAROV 160637N 0431338E		~~ITOLI 152825N 0450927E~~
	IMSIL 155738N 0434112E		
	ASREM 154637N 0441443E		
	RAKID 154134N 0442959E		
	ITOLI 152825N 0450927E		
	LONIS 151910N 0460016E		
	MEMTA 150322N 0472434E		
	OBNIS 145840N 0474903E		
	BOSAX 144740N 0484553E		
	MUKALLA (RIN) 144015.30N 0492329.30E		~~MUKALLA (RIN) 144015N 0492329E~~
	EMABI 141627N 0494139E		
	XANLO 135653N 0495628E		
	PURKA 131208N 0503042E		
	ODBEN 123747N 0505648E		
	VEDET 120134N 05124~~1~~20E		~~VEDET 120134N 0512410E~~
M561	RAGAS 263537N 0521337E		
	*Note 7 (RAGAS-KIS)		
	EGMIT 263340N 0530825E		
	KISH ISLAND (KIS) 26131~~1~~0.6N 053574~~5~~4.7E	~~UM561~~	~~KISH (KIS) 263131N 0535745E~~
	MIVUN 263151N 0541953E		
	DENSA 263158N 0542920E		
	BANDAR LENGEH (LEN) 263210.1N 0545104.2E		
	BOSOS 264325N 0554311E		
	GHESHM ISLAND (KHM) 264547.1N 0555427.6E		
	*Note 7 (KHM- ASVIB)		
	~~MOBET 2645.3N 05609.8E~~PAVON 270206N 0561149E		~~MOBET 2645.3N 05609.8E~~
	RUKOT 265324N 0580339E		
	LADPA 265331N 0592514E		
	GOKSO 265542N 0604012E		
	ASVIB 265724N 0631812E		~~ASVIB 265724N 0631812E~~
	(PANJGUR (PG) 265710.21N 0640813.06E)		~~(PANJGUR) (PG) 265710N 0640813E~~
M562	VATEN 153358N 0323312E		
	PASIL 161331N 0332010E		
	BOPID 163948N 0335142E		
	IMTAR 170609N 0342331E		
	PORT SUDAN (PSD) 19240412N 037143021E		
	BOGUM 200636N 0380300E		
	MIPOL 203322N 0382145E		
M564	PASOV 243841N 0565037E		
	*Note 7 (PASOV-UMAMI)		
	PUXIL 244117N 0563145E		
	VAXAS 244308N 0561807E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	NALNU 244737N 0560925E		
	UMAMI 245113.7N 0560223.3E		
M565	ALRAP 133945N 0361344E		
	*Note 7 (ALRAP-LUGAV)		
	EGTOT 144511N 0353913E		
	GIDAR 152731N 0351642E		
	ELONO 163635N 0343934E		
	IMTAR 170609N 0342331E		
	DARIB 193159N 0330252E		
	ENABU 220000N 0322927E		
	LUGAV 224205N 0313722E		
M568	NUBAR 220000N 0313824E		
	UMIDA 185115N 0311704E		
	ASNON 150818N 0305312E		
	KASAB 134346N 0304233E		
	KINOV 093414N 0301149E		
	DEKUM 043742N 0293936E		
M572	NOLSU 251248.0N 0560737.8E		
	*Note 7 (NOLSU-GOMTA)		
	GOMTA 251115N 0563447E		
M573	TEHERAN (TRN) 354149.10N 05117021.60E	~~UM573~~	~~TEHERAN (TRN) 354149N 0511702E~~
	DAMOS 372619N 0474521E		
	TABRIZ (TBZ) 380853.50N 04612473.95.70E		~~TABRIZ (TBZ) 3808.53N 04612473.9E~~
M574	~~MALE) (MLE) 041223N 0733139E~~	~~UM574~~	~~MALE) (MLE) 041223N 0733139E~~
	~~(POPET) 071343.7N06813.36E~~		~~(POPET) 071343.7N06813.36E~~
	NABIL 122200~~E~~N 0600006E		~~NABIL 1222.00E0600.006E~~
	BOTEM 135413N 0551418E		
	RIGAM 143932N 0530414E		~~RIGAM 143932N 0530414E~~
	UKSAB 145200N 0521800E		
	NODLI 150301N 0513549E		
	PURUG 151204N 0510142E		
	EGMIX 151811N 0503810E		
	UKORA 152407N 0501547E		
	TAVLI 153502N 0493430E		
	RALMO 153824N 0492155E		
	NABUP 155417N 0482143E		
	MUTOK 161005N 0472228E		
	LABRA 161813N 0465113E		
	OVABI 162442N 0462642E		
	RAGNI 163454N 0454815E		
	ELONA 165753N 0442124E		
	NOBSU 171554N 043131~~8~~5E		~~NOBSU 171554N 0431318E~~
M600	RANBI 251908N 0544500E	~~UM600~~	~~RANBI 251908N 0544500E~~
	KISAG 251834N 0541408E		~~KISAG 251834N 0541408E~~
	TUMAK 255031N 0531108E		~~TUMAK 255031N 0531108E~~
	*Note 7 (TUMAK- KUMBO)		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	VEDOM 260109N 0524456E		~~VEDOM 260109N 0524456E~~
	ORLUP 260651N 0523216E		
	VELAK 261307N 0521821E		~~VELAK 261307N 0521821E~~
	LABOP 261907N 0520429E		~~LABOP 261907N 0520429E~~
	ALTOM 262230N 0515639E		~~ALTOM 262230N 0515639E~~
	~~DASOS 262429N 0515043E~~BOPOV 262430N 0515043E		~~DASOS 262429N 0515043E~~
	ALMOK 262832N 0513840E		~~ALMOK 262832N 0513840E~~
	GITBO 263527N 0511750E		
	VEDOS 26410~~5~~6N 051004~~4~~5E		~~VEDOS 264105N 0510044E~~
	~~NABOS 264354N 0505145E~~		~~NABOS 264354N 0505145E~~
	MOGAS 264~~759~~800N 0503909E		~~MOGAS 264759N 0503909E~~
	RAKAK 265221N 0502618E		~~RAKAK 265221N 0502618E~~
	RAMSI 270249N 0500714E		~~RAMSI 270249N 0500714E~~
	ORNAK 27285~~3~~4N 0493248E		~~ORNAK 272853N 0493248E~~
	SOLEM 275229N 0491136E		~~SOLEM 275229N 0491136E~~
	KUMBO 281705N 0485526E		~~KUMBO 281705N 0485526E~~
M628	DAFINAH (DFN) 231~~700~~658N 0414312~~2~~0E	~~UM628~~	~~DAFINAH (DFN) 231700N 0414312E~~
	*Note 7 (UMRAN - DFN)		
	DIPEX 231656N 0424758E		
	NALBA 231639N 0433419E		
	DAXUR 231537N 0445436E		
	UMRAN 231508N 0452023E		
	*Note 7 (UMRAN - MIGMA)		
	DEBAS 231059N 0462728E		
	AMBAG 230529N 0474611E		
	DEGNO 225945N 0485954E		
	~~KIPOM 225316N 0501518E~~		~~KIPOM 225316N 0501518E~~
	MIGMA 225035N 0512749E		~~MIGMA 225035N 0512749E~~
	BOSAK 225021N 0514213E		
	~~KITAP 224928N 0522923E~~KATIT 224928N 0522923E		~~KITAP 224928N 0522923E~~
	~~ALPEK 224648N 0535942E~~PEKEM 224648N 0535942E		~~ALPEK 224648N 0535942E~~
	RIGIL 230146N 0551430E		
	LUDID 230227N 0551800E		~~LUDID 230227N 0551800E~~
	GOGMI 230215N 0553159E		
	*Note 7 (TULBU-LUDID)		
	LABSA 230153N 0555505		~~LABSA 230153N 0555505E~~
	EGVAN 230127N 0561907		~~EGVAN 230127N 0561907E~~
	KUNGO 230034N 0565850E		
	TULBU 230005N 0571827		~~TULBU 230005N 0571827E~~
	IZ~~I~~KI (IZK) 2253198.60N 057454~~3~~2.73		~~IZIKI (IZK) 2253198.60N 05745432.73E~~
	TOLDA 224008N 0583624E		~~TOLDA 224008N 0583624E~~
	*Note 7 (PARAR-TODLA)		
	LOXOP 223722N 0594548E		~~LOXOP 223722N 0594548E~~
	LOSIM 223513N 0603238E		~~LOSIM 223513N 0603238E~~
	IVOMA 223408N 0605430E		~~IVOMA 223408N 0605430E~~
	PARAR 222630N 0630700E		~~PARAR 222630N 0630700E~~
M634	ANGAL 161404N 0600004E	~~UM634~~	~~ANGAL 1614046N 06000046E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	TOKPU 145122N 0571103E		
	BOTEM 135413N 0551418E		
	KEDAV 125553N 0531509E		
	VEDET 120134N 05124~~1~~20E		~~VEDET 120134N 0512410E~~
	~~DAROT 0911.4N 04721.2E~~(IMTIS 112506N 0502858E)		~~DAROT 0911.4N 04721.2E~~
M651	NADKI 171418N 0464706E		
	OVABI 162442N 0462642E		
	MEGPA 160017N 0461653E		
	PASAD 153634N 0460713E		
	LONIS 151910N 0460016E		
	PEBIX 144447N 0454637E		
	LADLI 132724N 0451604E		
	~~ATBOT 171418N 0464706E~~	~~UM651~~	~~ATBOT 171418N 0464706E~~
	ADEN (KRA) 124952.20N 0450125E		~~ADEN (KRA) 124952N 0450125E~~
	KORAB 121109N 0445028E		
	~~(HARGEISA) HARGA 093112N 0440530E~~OKTOB 114730N 0444348E		~~(HARGEISA) HARGA 093112N 0440530E~~
	(IMVEB 112638N 0443753E)		
M677	SESR~~A~~U 290~~8~~900N 048545~~4~~0E	~~UM677~~	~~SESRA 290800N 0485454E~~
	*Note 7 (SESRA- TUKSI)		
	RETEL 285236N 0491048E		
	RABAP 283625N 0492722E		~~RABAP 283625N 0492722E~~
	PASAK 282~~459~~500N 049484~~6~~7E		~~PASAK 282459N 0494846E~~
	~~GOGMA 281421N 0495612E~~		~~GOGMA 281421N 0495612E~~
	IVIVI 273734N 0502437E		~~IVIVI 273734N 0502437E~~
	DEBGU 272648N 0503252E		
	VEDOR 270855N 0504630E		~~VEDOR 270855N 0504630E~~
	TOSDA 27000~~4~~5N 0505629E		~~TOSDA 270004N 0505629E~~
	TORBO 26522~~2~~3N 0511024E		~~TORBO 265222N 0511024E~~
	SEVNI 264401N 0513815E		
	SOGAN 263915N 0515408E		~~SOGAN 263915N 0515408E~~
	MURUB 262455N 0523751E		
	UKNEP 262127N 0524818E		
	DEGSO 261054N 0531946E		~~DEGSO 261054N 0531946E~~
	OBNET 260032N 0534514E		~~OBNET 260032N 0534514E~~
	~~ITITA 254410N 0541839E~~LUDAM 255508N 0535859E		~~ITITA 254410N 0541839E~~
	~~SERSA 251945N 0553118E~~ITBUL 254910N 0541227E		~~SERSA 251945N 0553118E~~
	~~LALDO 251806N 0563600E~~DIXAM 254151N 0543557E		~~LALDO 251806N 0563600E~~
	VUTEB 253644.6N 0545149.4E		
	LOVEM 252645.4N 0551440.4E		
	KURTU 252211N 0554625E		
	MISEG 252134N 0555205E		
	TUKSI 252006N 0560525E		
	IVURO 251940N 0560915E		
	KUSEN 251828.0N 0562340.0E		
	LALDO 251806N 0563600E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
M681	TARBO 244351N 0574637E	~~UM681~~	~~TARBO 244351N 0574637E~~
	*Note 7/8 (~~OO~~TARBO-DAMUM)		~~*Note 7/8 (OO)~~
	DAMUM 243236N 0591307E		~~DAMUM 243236N 0591307E~~
M686	LUXOR (LXR) 254458N 0324607E	~~UM686~~	~~LUXOR (LXR) 254458N 0324607E~~
	*Note 7 (JDW- LXR)		
	MEMPO 252518N 0335457E		~~MEMPO 252518N 0335457E~~
	OTEMO 250341N 0350810E		
	GIBAL 243713N 0363443E		~~GIBAL 2437132N 03634432E~~
	ALPOV 232037N 0374252E		
	BOMOX 222949N 0382704E		
	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E		~~KING ABDULAZIZ (JDW) 214244N 0390723E~~
M688	~~CARSAMBA (CRM) 411556N 0363256E~~	~~UM688~~	~~CARSAMBA (CRM) 411556N 0363256E~~
	~~GULRA 402247N 0381646E~~		~~GULRA 402247N 0381646E~~
	~~ERZINCAN (ERN) 394230N 0393145E~~		~~ERZINCAN (ERN) 394230N 0393145E~~
	~~EVSAS 391929N 0401119E~~		~~EVSAS 391929N 0401119E~~
	~~BAYIR 383541N 0412414 E~~		~~BAYIR 383541N 0412414 E~~
	~~ULTED 382102N 0414934E~~		~~ULTED 382102N 0414934E~~
	(OTKEP 375133N 0423936E)		~~OTKEP 375133N 0423936E~~
	*Note 7 (OTKEP- SIDAD)		
	~~NINVA 372100N 0431300E~~RATVO 371426N 0435604E		~~NINVA 372100N 0431300E~~
	~~ROXOP 364917N 0433100E~~KEDIM 364617N 0440909E		~~ROXOP 364917N 0433100E~~
	~~VUSEB 361637N E0434800E~~SOBIL 343000N 0451008E		~~VUSEB 361637N E0434800E~~
	~~OTALO 351700N 0441900E~~VAXEN 331800N 0451500E		~~OTALO 351700N 0441900E~~
	~~RIDIP 343012N 0444027E~~SISIN 325006N 0454113E		~~RIDIP 343012N 0444027E~~
	~~UKMUG 334300N 0450329E~~ULDUR 305023N 0472958E		~~UKMUG 334300N 0450329E~~
	~~VAXEN 3318 00N 0451500E~~		~~VAXEN 3318 00N 0451500E~~
	~~PAPUS 325334N 0452706E~~		~~PAPUS 325334N 0452706E~~
	~~KATUT 323737N 0453439E~~		~~KATUT 323737N 0453439E~~
	~~DENKI 322228.46N 04551221.58E~~		~~DENKI 322228.46N 04551221.58E~~
	~~ILMAP 312133N 0465702E~~		~~ILMAP 312133N 0465702E~~
	~~PEBAD 305023.09N 0472958.49E~~		~~PEBAD 305023.09N 0472958.49E~~
	SIDAD 295231N 0482944E		~~SIDAD 295231N 0482944E~~
M690	ZELAF 325656N 037~~1121~~5959E	~~UM690~~	~~ZELAF 325656N 0371121E~~
	ORNAL 324755N0375153E		~~ORNAL 324755N0375153E~~
	KODER 323300N 0373800E		~~KODER 323300N 0373800E~~
	DESLI 314900N_0365901E		~~DESLI 31492100N_03659019E~~
	ELOXI 313401N 0364534E		~~ELOXI 313401359N 03645346E~~
	KULDI 311847N 0363214E		~~KULDI 311847N 0363214E~~
	~~MAZAR 3049448.0N 036083510.0E~~MUNRA 304944N 0360835E		~~MUNRA MAZAR 3049448.0N 036083510.0E~~
	~~ROVAR 292438N0345711E~~		~~ROVAR 292438N0345711E~~
	LONOL 300801N 0353500E		~~LONOL 300801N 0353500E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SESMO 293458N 0351159E		~~SESMO 293458N 0351159E~~
	ULINA 292451N 034581~~7~~8E		~~ULINA 292451N 0345817E~~
	NUWEIBAA (NWB) 290156N 0344016E		~~NUWEIBAA (NWB) 290156N 0344016E~~
M691	~~DEDAS 2630.2N 05014.4E~~LADNA 262749N 0502245E	~~UM691~~	~~DEDAS 2630.2N 05014.4E~~ ~~LADNA 262749N 0502245E~~
	*Note 7 (ALPOT- LADNA)		
	KING FAHD (KFA) 262~~153~~951N 0494~~910~~643E		~~KING FAHAD 262153N 0494910E~~
	DASVA 264551N 0492301E		
	SILBA 270554N 0485301E		
	ALPOT 271841N 0480511E		
	~~KUSAR 264741N 0490218E~~		~~KUSAR 264741N 0490218E~~
	KEDAT 2721~~.8~~49N 04759~~.0~~1E		~~KEDAT 272149.8N 04759.01E~~
	EMENI 273234N 0473848E		
	ITIXI 275031N 0470435E		~~ITIXI 275031N 0470435E~~
~~T301~~ M701	LUMOM 371612N 0444924E		
	PAVOD 370204N 0451834E		
	ENEDA 355211N 0462718E		
	NOLTO 351435N 0465623E		
	KHORAM ABAD (KRD) 332603.1N 0481730.7E		
	DAPEM 325126N 0484159E		
	NAGRO 321015N 0491549E		
	IMKEN 314407N 0493611E		
	MESVI 311057N 0500006E		
	BOTAS 295241N 0505515E		
	IVERA 292303N 0511540E		
	DEPSU 283409N 0515047E		
	DURSI 271219N 0520144E		
	KAVAM 265737N 0515818E		
	MIDSI 264142N 0515442E		
~~T308~~ M708	DAROR 270244N 0495815E		
	*Note 7 (DAROR-DASUT)		
	RAMSI 270249N 0500714E		
	GASSI 270257N 0502229E		
	VELOG 270215N 0503056E		
	TOSDA 270005N 0505629E		
	TORBO 265223N 0511024E		
	SEVNI 264401N 0513815E		
	SOGAN 263915N 0515408E		
	MURUB 262455N 0523751E		
	DASUT 261832N 0531108E		
~~T215~~ M715	ASVIB 265724N 0631812E		
	SARAVAN (SRN) 272454.1N 0621931.5E		
	PEKES 285929N 0595221E		
	SILKO 295558N 0584138E		
	EGRES 304855N 0573144E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	PURBO 311346N 0565832E		
	PARID 313041N 0563358E		
	DANEM 322854N 0550717E		
	MITET 325226N 0542850E		
	PURKI 331140N 0535657E		
	KAVEK 332249N 0533814E		
	RERET 333336N 0532651E		
	OXADU 350837N 0511226E		
	IMLIM 351200N 0510400E		
	ELIPO 354046N 0502117E		
	ZANJAN (ZAJ) 364646.8N 0482111.9E		
~~T218~~ M718	ULDUS 380000N 0510100E		
	LABKA 364142N 0504342E		
	GOPKA 361256N 0503724E		
	DAVMI 355657N 0503401E		
	SAVEH (SAV) 350106.8 0502216.9E		
~~Q19~~ M719	MESPO 244817N 0595040E		
	NAGES 262452N 0594514E		
M720	DITAR 265903N 0250000E		
	DANAD 285106N 0280609E		
	TAKRI 292503N 0290432E		
	FAYOUM (FYM) 292351N 0302335E		
	CAIRO (CVO) 300532N 0312318E		
M762	REXOD 211230N 0613830E		
	*Note 7 (REXOD - VAXAS)		
	SUR (SUR) 223~~159~~247.9N 0592~~8~~929.70E		
	DELSO 225606N 0585233E		
	ITURA 232351N 0580720E		
	ALMOG 233524N0574940E		
	VELOD 234611N 0573435E		
	GEXAN 241257N 0565649E		
	TAPRA 242607N 0563803E		
	VAXAS 244308N 0561807E		
	~~*Note 7 (OM,OO)~~RUDAT 244605.1N 0561714.1E		
	MIVEK 245240N 0561516E		
M855	RASDA 330600N 0305700E		
	MIVOR 322922N 0300603E		
	GOMVA 320010N 0292615E		
	NABSI 314353N 0290419E		
	MERSA MATRUH (MMA) 311911N 0271320E		
	SIDI BARANI (BRN) 313432N 0260020E		
	LOSUL 314100N 250800E		
M860	~~KUGOS 424650.8N 0340516.3E~~	~~UM860~~	~~KUGOS 424650.8N 0340516.3E~~
	~~SINOP (SIN) 420120N 0350436E~~		~~SINOP (SIN) 420120N 0350436E~~

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	~~CARSAMBA (CRM) 411556N 0363256E~~		~~CARSAMBA (CRM) 411556N 0363256E~~
	(SIIRT (SRT) 375438.40N 0415255.10E)		~~SIIRT (SRT) 375438.6N 0415255.9E~~
	*Note 7 (GADSI - SIIRT)		
	EFFEZ 373518N 0423919E		
	~~KABAN N371456N 0423859E~~NINVA 372100N 0431300E		~~KABAN N371456N 0423859E~~
	~~EMIDO 364411.33N 0425600E~~ROXOP 364445N 0433322E		~~EMIDO 364411.33N 0425600E~~
	~~SEVKU 360548.02N 04317165.84E~~VUSEB 361637N 0434800E		~~SEVKU 360548.02N 04317165.84E~~
	~~UMESA 351741.49N 04343076.89E~~TOMSI 354858N 0440229E		~~UMESA 351741.49N 04343076.89E~~
	~~TAGRU 342958.95N 0440816.67E~~OTALO 351700N 0441900E		~~TAGRU 342958.95N 0440816.67E~~
	~~PUTSI 333200N E044 3700E~~NAMDI 343027N 0444133E		~~PUTSI 333200N E04443700E~~
	~~ITOVA 331950.91N 0444 28.97E~~		~~ITOVA 331950.91N 0444 28.97E~~
	SEPTU 331300N 0444400E		~~SEPTU 331300N 0444400E~~
	~~LONOR 3238398.63N 0450458.48E~~RESAK 323305N 0451552E		~~LONOR 3238398.63N 0450458.48E~~
	~~ULIMA 321500N 0451600E~~KODAV 314500N 0460400E		~~ULIMA 321500N 0451600E~~
	~~ITBIT 314735.20N 045 2916.57E~~GADSI 303358N 0471116E		~~ITBIT 314735.20N 045 2916.57E~~
	~~RUGIR 303219.06N 0460618.20E~~		~~RUGIR 303219.06N 0460618.20E~~
	~~MOBIS 2951098.84N 0470457.39E~~		~~MOBIS 2951098.84N 0470457.39E~~
M861	ELEXI 3442371.105N 04110549.0E	~~UM861~~	~~ELEXI 3442371.5N 04110549.0E~~
	DIER-ZZOR (DRZ) 351~~7~~831N 040~~09~~11~~1~~4E		~~DIER-ZZOR (DRZ) 351731N 0400914E~~
	TABQA 354704N 0383432E		
	ALEPPO (ALE) 361047N 0371234E		~~ALEPPO (ALE) 361047N 0371234E~~
	NISAP 3647~~2~~401N 03638~~3~~05E		~~NISAP 364724N 0363830E~~
	(MILBA 365705N 0362846E)		
M863	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E	~~UM863~~	~~KING ABDULAZIZ (JDW) 21424437N 0390723948E~~
	GIBAP 212218N 038093~~1~~0E		~~GIBAP 212218N 0380931E~~
	TOMRU 204411N 0361950E		~~TOMRU 204411N 0361950E~~
	DARIB 193159N 0330252E		
	SOMAK 190301N 0314717E		
	RAGSI 185526N 0312747E		
	UMIDA 185115N 0311704E		
	TAVNA 174808N 0283938E		
	SOGIN 171145N 0271200E		
	ASKOL 154854N 0240005E		~~ASKOL 154854.9N 0240005.1E~~
	KITOB 1521436N 022584~~5~~8E		~~KITOB 152143.7N 0225845.8E~~
	(IPONO 15062~~1~~4 N 0222436E)		~~IPONO 150621 N 0222436 E~~
	~~N'DJAMENA (FL) 120830.5N 0150218.3E~~		~~N'DJAMENA (FL) 120830.5N 0150218.3E~~
M872	~~PALEOCHORA (PLH) 351339.7N 0234051.9E~~ (LINGI 343043N 0243244E)	~~UM872~~	~~PALEOCHORA (PLH) 351339.7N 0234051.9E~~
	*Note 7 (~~PLH- SEMRU~~ ~~DBA~~ REXUM -LINGI)		~~*Note 7 (PLH- SEMRU DBA)~~
	METRU 340000N 0250900E		~~METRU 340000N 0250900E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	~~KANAR 322727N 0265330E~~ITEXO 325832N 0265834E		~~KANAR 322727N 0265330E~~
	~~EL DABA (DBA) 310041N 0282801E~~NABSI 314353N 0290419E		~~EL DABA (DBA) 310041N 0282801E~~
	SOBAX 313508N 0291835E		
	ORNAS 311838N 0291845E		
	REXUM 301822N 0291917E		
	FAYOUM (FYM) 292351N 0302335E		~~FAYOUM (FYM) 292351.8N 0302335.6E~~
	~~*Note 7 (FYM-SEMRU)~~LUBOS 284201N 0311306E		~~*Note 7 (FYM-SEMRU)~~
	SEMRU 280200N 0320306E		~~SEMRU 280200N 0320306E~~
	BOPOB 272253N 0332316E		
	HURGHADA (HGD) 271040N 0334747E		~~HURGHADA (HGD) 271040N 0334747E~~
	*Note 7 (HGD- KIA)		
	ALMOD 270123N 0341349E		
	SILKA 263400N 0352900E		~~SILKA 263400N 0352900E~~
	WEJH (WEJ) 261046N 0362917E		~~WEJH (WEJ) 261046N 0362917E~~
	~~KODIN 251753.9N 03836.12E~~KULKI 254814N 0371445E		~~KODIN 251753.9N 03836.12E~~
	TULOK 251001N 0383037E		
	BOVET 245742N 0385436E		
	EGVED 244857N 0391129E		
	MADINAH (PMA) 243251N 0394219E		~~MADINAH (PMA) 243251N 0394219E~~
	~~*Note 7 (PMA-MIDSI)~~MEDRO 242730N 0403649E		~~*Note 7 (PMA-MIDSI)~~
	GOKSA 242442N 0410403E		
	BIR DARB (BDB) 241951N 0414928E		~~BIR DARB (BDB) 241951N 0414928E~~
	AL DAWADMI (DAW) 242656N 0440709E		~~AL DAWADMI (DAW) 242656N 0440709E~~
	TASBA 243059N 0443028E		
	KAVUR 244246N 0454036E		
	KING KHALID (KIA) 245310N 0464534E		~~KING KHALID (KIA) 245310N 0464534E~~
	AKRAM 255036N 0475133E		~~AKRAM 255036N 0475133E~~
	*Note 8 (OB) to MIDSI		~~*Note 8 (OB) to MIDSI~~
	ALMAL 261553N 0482108E		~~ALMAL 261553N 0482108E~~
	DAVRI 264936N 0505732E		~~DAVRI 264936N 0505732E~~
	MIDSI 264142N0515442E		~~MIDSI 264142N0515442E~~
M877	VUSET 235540N 0590812E	~~UM877~~	~~VUSET 235540N 0590812E~~
	ITILA 2340155N 0584817E		~~ITILA 234015N 0584817E~~
	KUSRA 232426N 0582611E		~~KUSRA 232426N 0582611E~~
M999	(ZARZAITINE (IMN) 280359.60N 0093939.30E)		
	BUHRA 272234N 0124717E		
	SEBHA (SEB) 265944N 0142735E		
	HORUJ 270906N 0161442E		
	KEPOS 272230N 0182810E		
	MASIT 272816N 0194016E		
	ARRIG 272930N 0200112E		
	KARUB 273524N 0211524E		
	SODOR 273747N 0220159E		
	SARIR (GS) 273900N 0223000E	~~UM999~~	~~SARIR (GS) 273900N 0223000E~~
	DITAR 265903N 0250000E		~~DITAR 265903N 0250000E~~
	NAKDO 260554N 0282101E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DAMPO 254707N 0292708E		
	IMLAX 252924N 0302707E		
	EL KHARGA (KHG) 252654N 0303527E		~~EL KHARGA (KHG) 252654N 0303527E~~
	KUNAK 252745N 0304112E		~~KUNAK 252745N 0304112E~~
	EMENA 253749N 0315147E		
	LUXOR (LXR) 254458N 0324607E		~~(LUXOR) (LXR) 254458N 0324607E~~
	ELELI 251854N 0332934E		
	SEDVA 235813N 0354006E		
	DASPA 230121N 0370841E		
	DEDLI 224232N 0373719E		~~DEDLI 224232N 0373719E~~
	*Note 7 (DEDLI- JDW)		
	MUVOL 221749N 0381452E		
	~~IMLER 221706N 0381653E~~		~~IMLER 221706N 0381653E~~
	JEDDAH/KING ABDULAZIZ (JDW) 214244N 0390723E ~~TOKTO 194421N 00395945E~~ ~~DANAK 1608.00N 04129.00E~~ ~~(ASSAB) SB~~		~~KING ABDULAZIZ (JDW) 214244N 0390723E~~ ~~TOKTO 194421N 00395945E~~ ~~DANAK 1608.00N 04129.00E~~ ~~(ASSAB) (SB) 130400N 0423800E~~
	*Note 7 (LABNI-JDW)		
	BOSUT 204705N 0393158E		
	LOVIL 201553N 0394537E		
	DAVUV 194408N 0395924E		
	ABKAR 190511N 0401612E		
	LABNI 165620N 0410921E		
	DANAK 160800N 0412900E		
	APDOS 153955N 0413947E		
	(PURAD 145500N 0415354E)		
N39	ULDUS 380000N 0510100E		
	ULEXI 374344N 0510631E		
	NOSHAHR (NSR) 363946.1N 0512751.4E		
	ELEDI 350136N 0520356E		
N72	BATEV 381005N 0501419E		
	UMERO 375524N 0501514E		
	GOLNU 355711N 0502052E		
	ELIPO 354046N 0502117E		
	SESBI 353154N 0502130E		
	PEDAR 350826N 0502206E		
	SAVEH (SAV) 350106.8N 0502216.9E		
	UKITA 330657N 0500041E		
	IMKEN 314407N 0493611E		
	BANDAR MAHSHAHR (MAH) 303322.8N 0490858.0E		
	UKNAR 295538N 0490450E		
	TULAX 293853N 0490301E		
N300	DOHA/HAMAD ~~INTL~~ (DOH) 251459.66N 051363~~5~~4.80E	~~UN300~~	~~DOHA HAMAD INTL 2514.0N 05134.6E~~
	~~(DOH) 251459N 0513635E~~		~~(DOH) 251459N 0513635E~~
	*Note 7 & 8 ~~to~~ (DOH-~~TONVO~~LALDO)		~~*Note 7 & 8 to (DOH-TONVO)~~
	ELOBI 250753N 0521722E		~~ELOBI 250753N 0521722E~~
	NAMLA 250532N 0523318E		~~NAMLA 250532N 0523318E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	MIBRU 250321N 0524540E		
	~~BOXAK 244536N 0540032E~~RUGIS 245916N 0530340E		~~BOXAK 244536N 0540032E~~
	~~MIADA 245112N 0545736E~~KAXOB 245423N 0532450E		~~MIADA 245112N 0545736E~~
	~~TONVO 250500N 0563200E~~GIDOB 244445.3N 0535952.6E		~~TONVO 250500N 0563200E~~
	ORBOL 245134N 0542348E		
	LORID 245552.5N 0543904.1E		
	VEKOV 245750N 0544925E		
	OBREV 250200N 0551135E		
	LAGTA 250602N 0553315E		
	RUKOR 250823N 0554603E		
	NOLSU 251248.0N 0560737.8E		
	SUTVO 251531N 0562153E		
	LALDO 251806N 0563600E		
N302	SIDAD 295231N 0482944E	~~UN302~~	~~SIDAD 295231N 0482944E~~
	*Note 7 (SIDAD-ALVIX)		
	~~ALVIX 291915N 04829441~~0EALVAX 292030N 0482422E		~~ALVIX 291915N 0482944E~~
N303	~~(HARGEISA) HARGA 093112N 0440530E~~ (KASOL 283147N 0531533E)	~~UN303~~	~~(HARGEISA) HARGA 093112N 0440530E~~
	PARIM 123142N 0432712E		~~PARIM 123142.7N 04327.12E~~
	ORNIS 141615N 0423657E		
	KIPAM 150030N 0421526E		
	RIBOK 154700N 0415230E		~~RIBOK154700N 0415230.5E~~
	LABNI 165620.3N 0410921.4E		~~LABNI 165620.3N 0410921.4E~~
N307	MELDO 320201N 0310406E	~~UN307~~	~~MELDO 320201N 0310406E~~
	LAKTO 323800N 0320500E		~~LAKTO 323800N 0320500E~~
N310	BALMA 342856N 0350302E	~~UN310~~	~~BALMA 342856N 0350302E~~
	CHEKA (CAK) 34180~~2~~1.81N 0354~~200~~159.64E		~~CHEKA (CAK) 341802N 0354200E~~
	*Note 7 (CAK- LATEB)		
~~J222~~	LATEB 340154N 036240~~4~~3.60E		~~LATEB 340154.9N 0362404.1E~~
	LOTAX 335952N 0363231E		
	BASEM 333337.6N 0373907.1E		~~BASEM 333337.6N 0373907.1E~~
N311	NUBAR 220000N 0313824E		
	TOVIL 175557N 0304439E		
	DATIM 152833N 0301323E		
	JEBRA 125520N 0291349E		
	SIGNO 094716N 0275031E		
	ASKON 061745N 0262537E		
N312	ASVIB 265724N 0631812E		
	GENEV 264247N 0603757E		
	NOVSU 263407N 0573849E		
	MOBET 264406N 0560908E		
	GHESHM ISLAND (KHM) 264547.1N 0555427.6E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SERDU 264715N 0545757E		
	ROSUM 264741N 0543637E		
	LAVAN ISLAND (LVA) 264843.4N 0532121.1E		
	MIDSI 264142N 0515442E		
N314	ATMUL 220000N 0290530E		
	UMIDA 185115N 0311704E		
	KUVTI 163152N 0325025E		
	TIKAT 122418N 0353812E		
N315	ASPUX 1744064N 0600006E	~~UN315~~	~~ASPUX 174406N 0600006E~~
	KUTVI 184306N 0582642E		~~KUTVI 184306N 0582642E~~
	*Note: 7 (~~OO/OB~~KUTVI-SITOL)		~~*Note: 7 (OO/OB)~~
	MOBAB N201032 E0564415		
	ORSIT N202306 E0562915		
	VELIK 203322N 0561656E		
	IVENI 205158N 0555430E		
	SITOL 211604N 0552514E		~~SITOL 211604N 0552514E~~
	LOTOS 220000N 0503912E		~~LOTOS 220000N 0503912E~~
	RAPMA 232256N 0482028E		~~RAPMA 232256N 0482028E~~
	RESAL 240649N 0470427E		~~RESAL 240649N 0470427E~~
	KING KHALED (KIA) 245310N 0464534E		~~KING KHALED (KIA) 245310N 0464534E~~
N316	HALAIFA (HLF) 262603N 0391609E	~~UN316~~	~~HALAIFA (HLF) 262603N 0391609E~~
	NETOL 270748N 0363226E		
	PASAM 273045N 0345542E		~~PASAM 273045N 0345542E~~
	*Note: 7 (PASAM–HDG)		
	HURGHADA (HDG) 271040N 0334747E		
N317	MENSA 245750N 0563249E		
	NOLSU 251248.0N 0560737.8E		
	REXEV 251502.3N 0560136.7E		
	NADNI 251915.2N 0555658.9E		
N318	MOUAB 314758N 0353559E		
	QUEEN ALIA (QAA) 314423.41N 0360926.59E	~~UN318~~	~~QUEEN ALIA (QAA) 314423N 0360926E~~
	ALNOR 313955N 0362507E		~~ALNOR 313955N 0362507E~~
	KINUR 313626N 0363714E		~~KINUR 313626N 0363714E~~
	ELOXI 313359N 0364536E		~~ELOXI 313359N 0364536E~~
	GENEX 312935N 370052E		~~GENEX 312935N 370052E~~
	GURIAT (GRY) 312445N 0371712E		~~GURIAT (GRY) 312445N 0371712E~~
	*Note: 7 (GRY-ORKAS)		
	ORKAS 304725N 0384617 E		~~ORKAS 3047254N 0384617E~~
	NEVOL 302446N 0393841E		~~NEVOL 302446N 0393841E~~
	GIBAM 300018N 0401632E		
	VELAL 294602N 0403821E		~~VELAL 294602N 04038214E~~
	SITOD 292143N 0412313E		
	TOLDI 290329N 0415621E		
	TAMRO 283838N 0424047E		~~TAMRO 283838N 0424047E~~
	~~*Note7 (OE, OB, OM, OO)~~NOTLI 281200N 0433714E		~~*Note7 (OE, OB, OM, OO)~~
	LOXOM 275648N 0440832E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	MOGON 2738487N 0444554E		~~MOGON 273848N 0444554E~~
	EMARO 273342N 0451330E		
	DEBOL 272116N 0461843E		
	*Note: 7 (DEBOL-REXOD)		
	~~TAGSO 272744N 0454510E~~MAANI 270812N 0473152E		~~TAGSO 272744N 0454510E~~
	*Note 8 (OB, OO)		~~*Note 8 (OB, OO)~~
	~~EGNOV 270301N 0474713E~~GESOR 270322N 0475751E		~~EGNOV 270301N 0474713E~~
	~~KUSAR 264741N 0490218E~~NADEN 265250N 0484448E		~~KUSAR 264741N 0490218E~~
	~~ASPAN 263255N 0494903E~~DASVA 264551N 0492301E		~~ASPAN 263255N 0494903E~~
	~~DEDAS 263011N 0501427E~~OTERA 264110N 0493841E		~~DEDAS 263011N 0501427E~~
	NAGTO 263717N 0495137E		
	RABKA 263531N 0495728E		
	SIBGA 263416N 0500134E		
	LADNA 262749N 0502245E		~~LADNA 262749N 0502245E~~
	ELOSO 262409N 0503551E		~~ELOSO 262409N 0503551E~~
	~~DAVOV 262255N 0504013E~~		~~DAVOV 262255N 0504013E~~
	GOLKO 262149N 0504404E		~~GOLKO 262149N 0504404E~~
	ASTAD 261812N 0505646E		~~ASTAD 261812N 0505646E~~
	LUBET 261441N 0510347E		
	TOTIS 261119N 0511027E		~~TOTIS 261119N 0511027E~~
	RASDI 260425N 0512407E		~~RASDI 260425N 0512407E~~
	VELAM 255426N 0514347E		~~VELAM 255426N 0514347E~~
	VUTAN 255016N 0515218E		~~VUTAN 255016N 0515218E~~
	RESAR 253707N 0522328E		~~RESAR 253707N 0522328E~~
	ALSEM 252703N 0524322E		~~ALSEM 252703N 0524322E~~
	OVONA 252443N 0524739E		~~OVONA 252443N 0524739E~~
	~~(LOXAT REXOD)~~		~~(LOXAT-REXOD)~~
	~~KATIK 251709N 0531515E~~PUTIB 251900N 0525755E		~~KATIK 251709N 0531515E~~
	~~KANIP 2410402N 0552042E~~BOXOT 251039N 0531817E		~~KANIP 2410402N 0552042E~~
	~~LABRI 240344N 0553842E~~KAPUM 245815N 0533450E		~~LABRI 240344N 0553842E~~
	~~EGROK 235253N 0560126E~~BOSEV 245013.3N 0540448.8E		~~EGROK 235253N 0560126E~~
	~~LAKLU 232235N 0570401E~~MOGIM 244053N 0542820E		~~LAKLU 232235N 0570401E~~
	~~GEVED 230105N 0575111E~~IMLIP 243648N 0543549E		~~GEVED 230105N 0575111E~~
	~~TOLDA 223720N 0583503E~~ELEPO 243211N 0544410E		~~TOLDA 223720N 0583503E~~
	~~REXOD 211230N 0613830E~~SIXIV 242009N 0550439E		~~REXOD211230N 0613830E~~
	KANIP 241040N 0552042		
	LABRI 240344N 0553842E		
	EGROK 235253N 0560126E		
	LAKLU 232235N 0570401E		
	GEVED 230105N 0575111E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	TOLDA 22~~3720~~4008N 0583~~503~~624E		
	REXOD 211230N 0613830E		
N319	DERBO 292542N 0611701E		
	ZAHEDAN (ZDN) 292912.3N 060540~~6~~5.7E	~~UN319~~	~~ZAHEDAN (ZDN) 292912N 0605406E~~
	KUVAV 313426N 0585747E		
	IMPAT 322451N 0580856E		
	ROXEK 331123N 0572138E		
	TABAS (TBS) 334021.2N 056533~~1~~0.9E		~~TABAS (TBS) 334021N 0565331E~~
	RABER 343656N 0555902E		
	ITELO 353534N 0550052E		
	ODKAT 354650N 0544146E		
	DASHT-E-NAZ (DNZ) 36385~~5~~3.6N 0531120.1E		~~DASHT-E-NAZ (DNZ) 363855N 0531120E~~
	DASEL 371113N 0522020E		
	RIGAN 373543N 0514052E		
	ULDUS 380000N 0510100E		~~ULDUS 3800.00N 05101.00E~~
	~~LUSAL 4035.00N 04757.00E~~(NASIL 390100N 0495100E)		~~LUSAL 4035.00N 04757.00E~~
	~~ADEKI 4117.48N 04645 .00E~~		~~ADEKI 4117.48N 04645 .00E~~
	~~TBILIS (TBS) 414014N 0445649E~~		~~TBILIS (TBS) 414014N 0445649E~~
	~~MUKHARANI (DF) 415500N 0443356E~~		~~MUKHARANI (DF) 415500N 0443356E~~
	~~ALI (BT)~~		~~ALI (BT)~~
	~~LOBIN 42042810.9N 04300156.4E~~		~~LOBIN 42042810.9N 04300156.4E~~
	~~IBERI 4209.6N 04143.3E~~		~~IBERI 4209.6N 04143.3E~~
N320	KISAL 101811N 0232526E		
	GINKA 124701N 0250831E		
	BOXIG 155958N 0272606E		
	TAVNA 174808N 0283938E		
	LAMAB 182601N 0290548E		
	NUBAR 220000N 0313824E		
N321	TIKAT 122418N 0353812E		
	BOPID 163948N 0335142E		
	BILAL 184044N 0330227E		
	NUBAR 220000N 0313824E		
N324	ALNUG 213009N 0500453E		
	PURDA 210805N 0510329E	~~UN324~~	~~PURDA 210805N 0510329E~~
	METNO 201418N 0524050E		
	MIPUB 200004N 0530607E		
	GOBRO 193622N 0534741E		~~GOBRO 193622N 0534741E~~
	ASTUN 180832N 0551040E		~~ASTUN 180832N 0551040E~~
N430	TARBO 244351N 0574637E	~~UN430~~	~~TARBO 244351N 0574637E~~
	~~*Note 7/8 (OO)~~ *Note: 7 (TARBO - ITLOB)		~~*Note 7/8 (OO)~~
	ITLOB 244325N 0590701E		~~ITLOB 244325N 0590701E~~
N438	LITAN 333456.28N 0343758.80E	~~UN438~~	~~LITAN 333456N 0343758E~~
	KALDE (KAD) 33482~~7~~6.70N 03529~~10~~09.53E		~~KALDE (KAD)334827N 0352910E~~
	CHEKA (CAK) 34180~~2~~1.81N 0354~~200~~159.64E		~~CHEKA (CAK) 341802N 0354200E~~
	KLEYATE (RA) 343510N 0360010E		~~KLEYATE (RA) 343510N 0360010E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
N440	MOBON 274414N 0552513E	~~UN440~~	~~MOBON 274414N 0552513E~~
	*Note: 7 (GABKO-MOBON)		
	BOSOS 264325N 0554311E		
	RADEB 261140N 0554719E		
	~~DARAX 260916N 0555307E~~GABKO 260404N 0554755E		DARAX 260916N 0555307E
N558	DEKUM 043742N 0293936E		
	LOROG 093551N 0295448E		
	NABUS 110003N 0295910E		
	DATIM 152833N 0301323E		
	ASRAV 172442N 0301943E		
N563	(KATBI 193133N 065002E)		
	REXOD 211230N 0613830E	~~UN563~~	~~(BANGALORE) BBG~~
	*Note 8 (OB, OM)		~~*Note 8 (OB, OM)~~
	*Note 7 ~~(OB, OO, OM~~REXOD- ALPOB)		~~REXOD 211230N 0613830E~~
	EMURU 221357N 0585338E		~~*Note 7 (OB, OO,OM)~~
	TULBU 230005N 0571827E		~~EMURU 221357N 0585338E~~
	MEKNA 2233309N 0560815E		~~TULBU 230005N 0571827E~~
	KURTA 234205N 0554900E		
	SODEX 234954N 0553202E		~~MEKNA 223309N 0560815E~~
	ELUDA 235107N 0552905E		
	NOBTO 235525N 0551840E		~~SODEX 234954N 0553202E~~
	~~ADV~~SIGMO 240710N 0545837E		~~NOBTO 235525N 0551840E~~
	~~MEMBI 243705N 0542631E~~VUXOD 242005N 0543625E		~~MEMBI 243705N 0542631E~~
	UMIBU 242331N 0543027E		
	~~ATBEX 250739N 0535019E~~KUGTO 243231N 0542224E		~~ATBEX 250739N 0535019E~~
	~~ITROK 253557N 0532751E~~BOSEV 245013.3N 0540448.8E		~~ITROK 253557N 0532751E~~
	~~ALPOB 254218N 0530055E~~ITKEV 250104N 0534526E		~~ALPOB 254218N 0530055E~~
	~~ROTAG 255353N 0523621E~~KUSBA 251634N 0532847E		~~ROTAG 255353N 0523621E~~
	~~SOLEG 260159N 0521756E~~TAGDU 252258N 0532153E		~~SOLEG 260159N 0521756E~~
	~~SOLOB 262241N 0513132E~~IMGUX 252950N 0531428E		~~SOLOB 262241N 0513132E~~
	~~MEDMA 263412N 0505454E~~ALPOB 254218N 0530055E		~~MEDMA 263412N 0505454E~~
	TOTLA 263806N 0504301E		~~TOTLA 263806N 0504301E~~
	RULEX 264529N 0501745E		~~RULEX 264529N 0501745E~~
	SILNO 264026N 0475745E		~~SILNO 264026N 0475745E~~
	GIBUS 255724N 0472829E		~~GIBUS 255724N 0472829E~~
~~Q52~~ N565	KAMEL 322000N 036440E		
	ZELAF 325700N 0380000E		
N568	AVONO 092606N 0335418E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DEDVA 102746N 0333134E		
	SUVRI 135436N 0321800E		
	TOVIL 175557N 0304439E		
	ATMUL 220000N 0290530E		
N569	BONUM 221252N 0393805E	~~UN569~~	~~BONUM 221252N 0393805E~~
	RABTO 221608N 0400326E		~~RABTO 221608N 0400326E~~
	VEMEM 221554N 0400118E		~~VEMEM 221554N 0400118E~~
	LOTOS 220000N 0503912E		~~LOTOS 220000N 0503912E~~
	*Note:- 7 (LOTOS-GOLNI)		~~*Note:- 7 (LOTOS-GOLNI)~~
	TOKRA 220925N 0553350E		~~TOKRA 220925N 0553350E~~
	*Note: 7 (GISKA-TOKRA)		
	SUTLI 220121N 0560404E		
	TOPSO 215653N 0562043E		~~TOPSO 215653N 0562043E~~
	MOGOK 215057N 0564236E		~~MOGOK 215057N 0564236E~~
	KEBAS 214330N 0570948E		~~KEBAS 214330N 0570948E~~
	GISKA 213503N 0574014E		~~GISKA 213503N 0574014E~~
	UMILA 211555N 0584738E		~~UMILA 211555N 0584738E~~
	GOLNI 210014N 0594130E		~~GOLNI 210014N 0594130E~~
	LOTAV 203700N 0605700E		~~LOTAV 203700N 0605700E~~
N571	~~(GUNIP 042954.9N 09931.48E)~~	~~UN571~~	~~(GUNIP 042954.9N 09931.48E)~~
	~~(VAMPI 061056.9N 0973508.1E)~~		~~(VAMPI 061056.9N 0973508.1E)~~
	~~(MEKAR 063014.2N 0692928.5E)~~		~~(MEKAR 063014.2N 0692928.5E)~~
	~~(SUGID- 193303.1N 06921.00E)~~(DOGET 210703N 0660001E)		~~(SUGID- 193303.1N 06921.00E)~~
	PARAR 222630N 0630700E		~~PARAR 222630.5 N 0630700E~~
	*Note 7 & 8 (~~OB, OM, OO~~PARAR-ALPOB)		~~*Note 7 & 8 (OB, OM, OO)~~
	KIPOL 230410N 0612903E		~~KIPOL 230410N 0612903E~~
	RAGMA 23~~0600~~2301N 06~~10539~~03846E		~~RAGMA 230600N 0610539E~~
	SODEB 234747N 0593023E		~~SODEB 234747N 0593023E~~
	VUSET 235540N 0590812E		~~VUSET 235540N 0590812E~~
	TOVDI 240733N 0584021E		
	KIROP 243000N 0574700E		~~KIROP 243000N 0574700E~~
	ASNIB 243949N 0572105E		
	~~SENTO 251908N 0544500E~~MENSA 245750N 0563249E		~~MENSA 245750N 0563249E~~
	~~AVAMI 250554N 0555647E~~LUBAT 250223N 0561749E		~~AVAMI 250554N 0555647E~~
	~~ATBOR 251007N 0551947E~~ENEGA 250556N 0560601E		~~ATBOR 251007N 0551947E~~
	~~MUVLA 251716N 0544500E~~RUKOR 250823N 0554603E		~~MUVLA 251716N 0544500E~~
	~~SENTO 251908N 0544500E~~IVOXI 251239.6N 0552513.1E		~~SENTO 251908N 0544500E~~
	TUDIS 251009N 0550825E		
	~~ELUKU 252910N 0535610E~~SENPA 251959.6N 0543210.5E		~~ELUKU 252910N 0535610E~~
	~~ITROK 253557N 0532751E~~RUDUK 252408N 0541650E		~~ITROK 253557N 0532751E~~
	ULIVA 252647N 0540611E		
	SISOB 253150N 0534509E		
	PURLI 253644N 0532436E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	ALPOB 254218N 0530055E		~~ALPOB 254218N 0530055E~~
	SOLOB 262241N 0513132E		~~SOLOB 262241N 0513132E~~
	MEDMA 263412N 0505454E		~~MEDMA 263412N 0505454E~~
	TOTLA 263806N 0504301E		~~TOTLA 263806N 0504301E~~
	RULEX 264529N 0501745E		~~RULEX 264529N 0501745E~~
	SILNO 264026N 0475745E		~~SILNO 264026N 0475745E~~
	KUTEM 264359N 0473521E		~~KUTEM 264359N 0473521E~~
	BOPAN (BPN) 270314N 0452642E		~~BOPAN (BPN) 270314N 0452642E~~
~~T872~~ N572	ROTEL 264015N 0502149E		
	*Note 7 (ROTEL-DASUT)		
	EGMOR 264211N 0502907E		
	DAVRI 264936N 0505732E		
	TORBO 265223N 0511024E		
	SEVNI 264401N 0513815E		
	SOGAN 263915N 0515408E		
	MURUB 262455N 0523751E		
	DASUT 261832N 0531108E		
N574	ATMUL 220000N 0290530E		
	ASRAV 172442N 0301943E		
	KASAB 134346N 0304233E		
	KISOV 100955N 0310359E		
	JUBA (JUB) 045234N 0313559E		
N629	TARDI 243418N 0560915E	~~UN629~~	~~TARDI 243418N 0560915E~~
	*Note 7 (~~OO~~TARDI-TOTOX)		~~*Note 7 (OO)~~
	NOSMI 241757N 0563002E		~~NOSMI 241757N 0563002E~~
	BOTAM 240227N 0565320E		
	ELIVA 235335N 0570634E		
	MUSUK 234320N 0572148E		~~MUSUK 234320N 0572148E~~
	IVAKU 232919N 0574103E		
	GEPOT 231446N 0580053E		~~GEPOT 231446N 0580053E~~
	GIDAN 230104N 0582232E		~~GIDAN 230104N 0582232E~~
	LOXOP 223722N 0594548E		
	TOTOX 215030N 0622230E		~~TOTOX 215030N 0622230E~~
N636	MAGRI 385408N 0462300E		
	ARDABIL (ARB) 381856.5N 0482605.1E		
	UMERO 375524N 0501514E		
	ULEXI 374344N 0510631E		
	RIGAN 373543N 0514052E		
	GORGAN (GGN) 365544.7N 0542233.3E		
	SABZEVAR (SBZ) 361011.0N 0573414.9E		
	LOXED 355854N 0580609E		
	PAMTU 351006N 0610806E		
N638	KING KHALED (KIA) 245310N 0464534E	~~UN638~~	~~KING KHALED (KIA) 245310N 0464534E~~
	OVEKU 250955N 0445701E		~~OVEKU 250955N 0445701E~~
	MADINAH (PMA) 243251N 0394219E		~~MADINAH (PMA) 243251N 0394219E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
N685	~~TAGSO 272744N 0454510E~~DEBOL 272116N 0461843E	~~UN685~~	~~TAGSO 272744N 0454510E~~
	*Note 7 (~~TAGSO~~DEBOL~~-KUSAR~~LAKLU)		~~*Note 7 (TAGSO-KUSAR)~~
	*Note 8 (TAGSO-TOSNA)		~~*Note 8 (TAGSO-TOSNA)~~
	~~DEBOL 272116N 0461843E~~		~~DEBOL 272116N 0461843E~~
	~~TORTA 271906N 0462911E~~MAANI 270812N 0473152E		~~TORTA 271906N 0462911E~~
	~~ALSAT 270611N 0473118E~~GESOR 270322N 0475751E		~~ALSAT 270611N 0473118E~~
	~~EGNOV 270301N 0474713E~~NADEN 265250N 0484448E		~~EGNOV 270301N 0474713E~~
	~~KUSAR 264741N 0490218E~~DASVA 264551N 0492301E		~~KUSAR 264741N 0490218E~~
	DAMMAM/KING FAHD (KFA) 262~~153~~951N 0494~~910~~643E		~~KING FAHAD (KFA) 262153N 0494910E~~
	NARMI 261802N 0501939E		~~NARMI 261802N 0501939E~~
	BAHRAIN (B~~A~~HR) 2615~~51~~30N 0503~~856~~919E		~~BAHRAIN (BAH) 261551N 0503856E~~
	TULUB 260644N 0510041E		
	DENVO 260452N 0510509E		~~DENVO 260452N 0510509E~~
	PATOM 255821N 0511836E		~~PATOM 255821N 0511836E~~
	EMISA 254658N 0514207E		~~EMISA 254658N 0514207E~~
	~~*Note 7 to LAKLU~~		~~*Note 7 to LAKLU~~
	KAPAX 254218N 0515118E		~~KAPAX 254218N 0515118E~~
	ORSIS 252801N 0521636E		~~ORSIS 252801N 0521636E~~
	ENANO 252348N 0522559E		~~ENANO 252348N 0522559E~~
	TOSNA 251612N 0524116E		~~TOSNA 251612N 0524116E~~
	~~TOPSI 250910N 0531200E~~UMEVU 250545N 0530653E		~~TOPSI 250910N 0531200E~~
	~~BOXAK 244536N 0540032E~~KAPUM 245815N 0533450E		~~BOXAK 244536N 0540032E~~
	~~ABU DHABI (ADV)242508N 0544024~~		~~ABU DHABI (ADV) 242508N 0544024~~
	~~RETAS 235754N 0553423E~~GIDOB 244445.3N 0535952.6E		~~RETAS 235754N 0553423E~~
	*Note 8 (OO)		~~*Note 8 (OO)~~
	~~PUTSO 232037N 0565322E~~SUVDU 243501N 0542410E		~~PUTSO 232037N 0565322E~~
	~~LAKLU 232235N 0570401E~~RURAL 243045N 0543156E		~~LAKLU 232235N 0570401E~~
	ODKUN 242608N 0544017E		
	NAPMA 241250N 0550312E		
	ORNEL 240311.7N 0551942.1E		
	RETAS 235754N 0553423E		
	KOBIM 233309N 0562701E		
	PUTSO 232037N 0565322E		
	LAKLU 232235N 0570401E		
N687	KING KHALID (KIA) 245310N 0464534E	~~UN687~~	~~KING KHALID (KIA) 245310N 0464534E~~
	TAKTI 252153N 0474340E		
	KINIB 254108N 0482317E		~~KINIB 254108N 0482317E~~
	MIBRA 255654N 0485053E		
	DEMKA 261008N 0491310E		
	SETBA 261346N 0491921E		
	~~*Note 5 & 7 & 8~~		~~*Note 5 & 7 & 8~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DAMMAM/KING FAHAD (KFA) 262~~153~~951N 0494~~910~~643E		~~KING FAHAD (KFA) 262153N 0494910E~~
	~~EMOLO 263559N 0500526E~~SIBGA 263416N 0500134E		~~EMOLO 263559N 0500526E~~
	*Note 7 (SIBGA-TORBO)		
	ROTEL 264015N 0502149E		~~ROTEL 264015N 0502149E~~
	EGMOR 264210.81N 0502906.73E		~~EGMOR 264210N 0502906E~~
	DAVRI 264936.05N 050573~~2~~1.88E		~~DAVRI 264936N 0505732E~~
	TORBO 26522~~3~~2.68N 0511024.30E		~~TORBO 265223N 0511024E~~
N694	KING KHALD (KIA) 245310N 0464534E	~~UN694~~	~~KING KHALD (KIA) 245310N 0464534E~~
	TORKI 261400N 0463103E		~~TORKI 261400N 0463103E~~
	SIBLI 265459N 0462334E		~~SIBLI 265459N 0462334E~~
	AKODI 275012N 0461320E		~~AKODI 275012N 0461320E~~
	HAFR AL BATIN (HFR) 281949N 0460746E		~~HAFR AL BATIN 281949N 0460746E (HFR)~~
N697	MENLI 294700N 0315206E	~~UN687~~	~~MENLI 294700N 0315206E~~
	SISIK 293600N 032410~~0~~6E		~~SISIK 293600N 0324100E~~
	*Note 7 (NWB-SISIK)		
	NUWEIBAA (NWB) 290156N 0344016E		~~NUWEIBAA~~
	*Note 7 (NWB-KITOT above FL350)		~~*Note 7 (NWB-KITOT above FL350)~~
	KITOT 290205N 0345050E		~~KITOT 290205N 0345050E~~
	NAGIP 284206N 0361133E		
	RABUG 283622N 0363402E		
	DAXEM 283224N 0364923E		
	NABEK 283030N 0365643E		
	SOBAS 275600N 03904543E		~~SOBAS 275600N 0390454E~~
	REVAB 273424N 0405710E		
	HAIL (HIL) 272530N 041405~~8~~9E		~~HAIL (HIL) 272530N 0414058E~~
	*Note 7 (~~HIL~~NARMI-~~KFA~~HIL)		~~*Note 7 (HIL KFA)~~
	LOSEL 272135N 0422545E		
	NALBU 271420N 0434206E		
	PASIT 271011N 0442253E		
	ALKIR 270758N 0444343E		
	BOPAN (BPN) 270312~~2~~4N 045264~~2~~3E		~~BPN 270312N 0452642E~~
	ANTER 270212N 0453359E		
	*Note 8 (BPN-TORBO)		~~*Note 8 (BPN-TORBO)~~
	SIBLI 265459N 0462334E		
	LUGAL 264603N 0472235E		
	MEDGO 264433N 0475257E		
	LABLI 264522N 0482100E		
	TAYMA 264556N 0484212E		
	DAMMAM/KING FAHD (KFA) 262~~153~~951N 0494~~910~~643E		~~KING FAHD (KFA) 262153N 0494910E~~
	NARMI 261802N 0501939E		~~NARMI 261802N 0501939E~~
	BAHRAIN (B~~A~~HR) 2615~~51~~30N 0503~~855~~919E		~~BAHRAIN (BAH) 261551N 0503855E~~
	*Note 7 (BAH-TORBO)		~~*Note 7~~
	GOLKO 262149N 0504404E		~~GOLKO 262149N 0504404E~~
	TOSTA 262746N 050491~~2~~3E		~~TOSTA 262746N 0504912E~~
	MEDMA 263421N 0505454E		~~MEDMA 263421N 0505454E~~
	VEDOS 26410~~5~~6N 051004~~4~~5E		~~VEDOS 264105N 0510044E~~
	SODAK 264634N 0510530E		~~SODAK 264634N 0510530E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	TORBO 265223N 0511024E		~~TORBO 265223N 0511024E~~
N705	MISUK 290507N 0290621E		
	*Note 7 (MISUK -TORBO)		
	BOPIX 295154N 0282438E		
	MUPSO 310034N 0272139E		
	MERSA MATRUH (MMA) 311911N 0271320E		
	SALUN 340000N 0242700E		
N710	BOPIX 295154N 0282438E		
	KIVIL 293845N 0284415E		
	TAKRI 292503N 0290432E		
N764	NOBSU 171554N 0431318~~8~~5E	~~UN764~~	~~NOBSU 171554N 0431318E~~
	LABDO 164842N 0442032E		
	IMDEN 162101N 0452744E		
	LOPAD 161651N 0453738E		
	MEGPA 160017N 0461653E		
	PAPOR 154322N 0465652E		
	DEKMA 152226N 0474553E		
	PAXUD 145436N 0485045E		
	MUKALLA~~H~~ (RIN) 144015.30N 0492329.30E		~~MUKALLAH (RIN) 144015N 0492329E~~
	XABIL 142924N 0494809E		
	NOTBO 142609N 0495530E		
	ORBAT 140638N 0503924E		
	GESIX 134440N 0512823E		
	KAVAN 133250N 0515431E		
	RAPDO 132317N 0521532E		
	KEDAV 125553N 0531509E		
	SOCOTRA (~~SOC~~SCT) 123749~~9~~8.80N 0535429~~9~~8.70E		~~SOCOTRA (SOC) 123749N 0535429E~~
	SUHIL 120000N 0550000E		~~SUHIL 120000N 0550000E~~
	~~NABAM 101112N 0581424E~~(AVELI 112201N 0560800E)		~~NABAM 101112N 0581424E~~
N767	PARAR 222630N 0630700E	~~UN767~~	~~PARAR 222630N 0630700E~~
	*Note 7 (PARAR-ELIGO)		
	VUSIN 225940N 0605510E		~~VUSIN 225940N 0605510E~~
	~~*Note 7 (OO)~~		~~*Note 7 (OO)~~
	ATBED 230352N 0603752E		~~ATBED 230352N 0603752E~~
	ELIGO 232458N 0590848E		~~ELIGO 232458N 0590848~~
N881	RASKI 230330N 0635200E	~~UN881~~	~~RASKI 230330N 0635200E~~
	SETSI 230412N 0614410E		~~SETSI 230412N 0614410E~~
	KIPOL 230410N 0612903E		~~KIPOL 230410N 0612903E~~
	*Note 7 (TULBU -KIPOL)		
	ATBED 230352N 0603752E		~~ATBED 230352N 0603752E~~
	AMBOS 230324N 0595405		~~AMBOS 230324N 0595405~~
	MUSRU 230256N 0592223E		~~MUSRU 230256N 0592223E~~
	~~*Note 7 (OO)~~		~~*Note 7 (OO)~~
	OBTIN 230216N 0585920E		~~OBTIN 230216N 0585920E~~
	GIDAN 230104N 0582232E		~~GIDAN 230104N 0582232E~~
	GEVED 230105N 0575111E		~~GEVED 230105N 0575111E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	TULBU 230005N 0571827E		~~TULBU 230005N 0571827E~~
N929	DASLO 254537N 0523029E	~~UN929~~	~~DASLO 254537N 0523029E~~
	*Note 7 & 8 to (DASLO-GIBUS)		~~*Note 7 & 8 to (DASLO-GIBUS)~~
	NAGOG 255214N 0521615E		~~NAGOG 255214N 0521615E~~
	BONAN 260201N 0515505E		~~BONAN 260201N 0515505E~~
	VEDED 260558N 0514628E		~~VEDED 260558N 0514628E~~
	SOGAT 262029N 0511443E		~~SOGAT 262029N 0511443E~~
	TOSTA 262746N 0504913E		~~TOSTA 262746N 0504913E~~
	DANAG 264438N 0494856E		~~DANAG 264438N 0494856E~~
	NADNA 264245N 0485309E		~~NADNA 264245N 0485309E~~
	SILNO 264026N 0475745E		~~SILNO 264026N 0475745E~~
	ASKOK 262623N 0474809E		~~ASKOK 262623N 0474809E~~
	MUSRI 261647.0N 0474137.0E		~~MUSRI 261647.0N 0474137.0E~~
	GIBUS 255724.0N 0472829.0E		~~GIBUS 255724.0N 0472829.0E~~
P146	RASHT (RST) 37193~~5~~4.8N 0493657.1E	~~UP146~~	~~RASHT (RST) 371935N 0493657E~~
	GODNA 382033N 0465457E		
	MURID 382744N 0463525E		
	SIBVU 384444N 0454657E		
	REXUS 385624N 0451332E		
	AGINA 391924N 0440512E		~~AGINA 3919.24N 04405.12E~~
	(AGRI (ARI) 393845~~5~~4.90N 0430137.50E)		~~(AGRI) (ARI) 393845N 0430137E~~
	~~(YAVUZ 4002.7N 04226.0E)~~		~~(YAVUZ 4002.7N 04226.0E)~~
	~~(TRABZON (TBN)~~		~~(TRABZON (TBN)~~
P300	KALDE (KAD) 33482~~7~~6.70N 035291~~10~~09.53E	~~UP300~~	~~KALDE (KAD) 334827N 0352910E~~
	LATEB 340154N 036240~~4~~3.60E		~~LATEB 340154.9N 0362404.1E~~
~~T202~~ P302	MIDSI 264142N 0515442E		
	DASDO 285401N 285401N		
P304	EMISO 231734N 0562307E ~~EGROK 235253N 0560126E~~ ~~*Note 7 (OO)~~ ~~MEKNA 233309N 0560815E~~ ~~EGVAN 230127N 0561907E~~ ~~DEMKI 224941N 0562308E~~ ~~NAMVA 223309N 0562223E~~ ~~TOPSO 215653N 0562043E~~ ~~KUROV 211627N 0561853E~~ ~~VELIK 203322N 0561656E~~	~~UP304~~	~~EGROK 235253N 0560126E~~ ~~*Note 7 (OO)~~ ~~MEKNA 233309N 0560815E~~ ~~EGVAN 230127N 0561907E~~ ~~DEMKI 224941N 0562308E~~ ~~NAMVA 223309N 0562223E~~ ~~TOPSO 215653N 0562043E~~ ~~KUROV 211627N 0561853E~~ ~~VELIK 203322N 0561656E~~
	DEMKI 224941N 0562308E		
	NAMVA 223309N 0562223E		
	TOPSO 215653N 0562043E		
	KUROV 211627N 0561853E		
	VELIK 203322N 0561656E		
P307	~~SHARJAH (SHJ) 2519454.9N 0553118.1E~~SERSA 251945N 0553118E	~~UP307~~	~~SHARJAH (SHJ) 2519454.9N 0553118.1E~~
	*Note 7 (SERSA-VAXIM)		
	PAVAG 251546N 0554042E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	ITBON 251426N 0555257E		
	KULBA 251326N 0560153E		
	NOLSU 251248.0N 0560737.8E		
	*~~Note 7 (OM,OO)~~		*~~Note 7 (OM,OO)~~
	TONVO 250500N 0563200E		~~TONVO 250500N 0563200E~~
	PURNI 243804N 0574354E		~~PURNI 243804N 0574354E~~
	*Note 8 (OO)		~~*Note 8 (OO)~~
	KUNUS 241927N 0583226E		~~KUNUS 241927N 0583226E~~
	ALSAS 240054N 0591955E		~~ALSAS 240054N 0591955E~~
	DERTO 235033N 0594746E		~~DERTO 235033N 0594746E~~
	VAXIM 231900N 0611100E		~~VAXIM 231900N 0611100E~~
	SETSI 230412N 0614410E		~~SETSI 230412N 0614410E~~
	PARAR 222630N 0630700E		~~PARAR 222630N 0630700E~~
P309	AVONO 092606N 0335418E		
	BOTOK 102859N 0334548E		
	SODIL 105401N 0334204E		
	ELULA 143253N 0330853E		
	KUVTI 163152N 0325025E		
	SOGAD 171404N 0324125E		
	NUBAR 220000N 0313824E		
P312	MUKALLA (RIN) 144015.30N 0492329.30E	~~UP312~~	~~MUKALLA (RIN) 144015N 0492329E~~
	ULDIB 141148N 0485422E		
	AMBOD 133357N 0481527E		
	DATEG 123549N 0471627E		
	~~PAKER 1155.00N0463500E~~TIMAD 115500N 0463500		~~PAKER 1155.00N0463500E~~
	~~(HARGEISA) HARGA 093112N 0440530E~~(EGROV 112042N 0455900E)		~~(HARGEISA) HARGA 093112N 0440530E~~
P313	VATEN 153358N 0323312E		
	KAREP 151838N 0313308E		
	ASNON 150818N 0305312E		
	DELAM 144001N 0290644E		
	DEBOX 144424N 0281037E		
	GAMAR 150042N 0240843E		
	IPONO 150624N 0222436E		
P315	NUBAR 220000N 0313824E		
	SOMAK 190301N 0314717E		
	MEROWE (MRW) 182448.81N 0314948.95E		
	ITOMO 102133N 0322108E		
	IMDUR 074114N 0323107E		
P316	SALALLAH (SLL) 170259.35N 05406576.91E	~~UP316~~	~~SALALLAH (SLL) 170259N 0540657E~~
	*Note 7 (OO)		~~*Note 7 (OO)~~
	DAXAM 171612N 0544715E		~~DAXAM 171612N 0544715E~~
	*Note 7 (DAXAM-MCT)		
	KAPOP 174544N 0550930E		
	GAGLA 180505N 0552410E		~~GAGLA 180505N 0552410E~~
	NALTI 182012N 0553431E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DEDSO 185811N 0560041E		
	GIVNO 195011N 0563059E		~~GIVNO 195011N 0563059E~~
	MOBAB 201032N 0564415E		~~MOBAB 201032N 0564415E~~
	GISKA 213503N 0574014E		~~GISKA 213503N 0574014E~~
	RADAX 220809N 0580230E		~~RADAX 220809N 0580230E~~
	MUSCAT (MCT) 233528.04N 0581536.48E		~~MUSCAT (MCT) 233528N 0581536E~~
~~T319~~ P319	DAROR 270244N 0495815E		
	*Note 7 (DAROR-DASUT)		
	RAMSI 270249N 0500714E		
	GASSI 270257N 0502229E		
	VELOG 270215N 0503056E		
	TOSDA 270005N 0505629E		
	OBTAR 265934N 0510309E		
P322	AVONO 092606N 0335418E		
	SITIK 092556N 0310809E		
	DEMTI 093203N 0264506E		
	ALMAM 093345N 0244451E		
	MONAN 093300N 0234000E		
P323	(DONSA 143518N 0651136E)	~~UP323~~	~~DONSA143518.3N0651136344.0E~~
	GIDAS 142004N0600000E		~~GIDAS 142004N0600000E~~
	TOKPU 145122N 0571103E		
	DAPAB 151115N 0552354E		
	NODMA 152600N 0533400E		~~NODMA 1526.00N05334.00E~~
	ENADO 153333N 0532015E		
	DAVRA 155918N 0523209E		
	TAKMI 160542N 0522012E		
	AL GHAIDAH (GDA) 161117N 0520942E		
	SIMKO 161821N 0515526E		
	THAMD 171700N 0495500E		~~THAMD 1717.00N 04955.00E~~
	KANEM 173700N 0492655E		
	ALNES 181818N 0482811E		
	KUTMA 182927N 0481202E		
	GERUG 185530N 0473402E		
	DAVLO 192343N 0465227E		
	WADI AL DAWASIR (WDR) 203019N 0451219E		~~WADI ALDAWASIR (WDR) 203019N 0451219E~~
P425	DAHRAN (DHA) 261538N 0500824E	~~UP425~~	~~DAHRAN (DHA) 261538N 0500824E~~
	*Note 8 to ALSER		~~*Note 8 to ALSER~~
	BAHRAIN (BAH) 261551N 0503855E		~~BAHRAIN (BAH) 261551N 0503855E~~
	DAVOV 262255N 0504012E		~~DAVOV 262255N 0504012E~~
	DATGO 262957N 0504130E		~~DATGO 262957N 0504130E~~
	TOTLA 263806N 0504301E		~~TOTLA 263806N 0504301E~~
	MEMKO 264611N 0504427E		~~MEMKO 264611N 0504427E~~
	BOXOG 265403N 0504553E		~~BOXOG 265403N 0504553E~~
	ALSER 271100N 0504900E		~~ALSER 271100N 0504900E~~
P430	DOHA/HAMAD INTL (DOH) 251459.66N 05136354.80E	~~UP430~~	~~DOHA/ HAMAD INTL~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	(DOH) 251459N 0513635E		~~(DOH) 251459N 0513635E~~
	*Note 7 & 8 (DOH-ALTOM) to MIDSI		~~*Note 7 & 8 (DOH-ALTOM) to MIDSI~~
	BAYAN 252926N 0514849E		~~BAYAN 252926N 0514849E~~
	*Note 7 to MIDSI (BAYAN-ALTOM)		~~*Note 7 to MIDSI~~
	KAPAX 254218N 0515118E		~~KAPAX 254218N 0515118E~~
	VUTAN 255016N 0515218E		~~VUTAN 255016N 0515218E~~
	ALVEN 255418N 0515315E		~~ALVEN 255418N 0515315E~~
	BONAN 260201N 0515505E		~~BONAN 260201N 0515505E~~
	RAMKI 261138N 0515625E		~~RAMKI 261138N 0515625E~~
	ALTOM 262230N 0515639E		~~ALTOM 262230N 0515639E~~
P440	EMIXI 242105N 0520019E		
	*Note 7 (ALGUX-EMIXI)		
	ELIGA 242121N 0530148E		
	ASRAT 242114N 0535944E		
	ALGUX 242247N 0541209E		
P513	BUBAS 245938N 0570003E		
	GERAR 240600N 0573616E		
	MIXAM 234139N 0575523E		
	~~*Note 7 (OO)~~		
	MUSCAT (MCT) 233528.04N 0581536.48E		
P517	WAFRA (KFR) 283715N 0475729E	~~UP517~~	~~WAFRA (KFR) 283715N 0475729E~~
	DEKOB 283135N 0475106E		
	*Note 7 (DEKOB-EMARO)		
	GOVAL 281211N 0472908E		~~GOVAL 281211N 0472908E~~
	DUSBO 280616N 0465254E		
	KAPAG 280355N 0463845E		
	NONLU 275921N 0461137E		
	KING SAUD AIR BASE (KMC) 275250N 0453320~~0~~1E		~~KING SAUD AB (KMC) 275250N 0453320E~~
	EMARO 273342N 0451330E		
~~T430~~ P550	ALVEN 255418N 0515315E		
	BONAN 260201N 0515505E		
	*Note 7 (ALVEN-SYZ)		
	MODOG 261012N 0515935E		
	LABOP 261907N 0520429E		
	KUMLA 262609N 0520822E		
	RAGAS 263537N 0521337E		
	KAPIP 264322N 0521403E		
	PEGET 270434N 0521515E		
	MIXEM 271520N 0521556E		
	LAGSA 283306N 0522056E		
	SHIRAZ (SYZ) 293224.6N 0523519.6E		
	REXEB 295208N 0520923E		
	YASOUJ (YSJ) 304136.0N 0513324.1E		
	RASLA 331202N 0493409E		
	RIGOX 350618N 0475636E		
	TUGEL 361220N 0470444E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	LAKLI 373730N 0455519E		
	VUVAG 382529N 0452926E		
	BORES 382829N 0452137E		
	DASIS 385435N 0441230E		
P552	DATEG 123549N 0471627E	~~UP552~~	~~DATEG 123549N 0471627E~~
	SEPRO 132824N 0475035E		
	ULAXI 141524N 0482317E		~~ULAXI 141524N 0482317E~~
	RASBA 144124N 0484128E		
	BOSAX 144740N 0484553E		
	PAXUD 145436N 0485045E		
	DEMNA 151652N 0490626E		
	RALMO 153824N 0492155E		
	GINBO 160349N 0494017E		~~GINBO 160349N 0494017E~~
	KEBER 170444N 0502029E		
	ITELI 171310N 0502605E		
	IMPOS 183137N 0511848E		~~IMPOS 183137N 0511848E~~
P555	OBVOM 241503N 0515552E		
	LONUT 241520N 0530149E		
	IMKUD 241513N 0535956E		
	RAPNO 241452N 0541559E		
	ATUDO 241708.0N 0543432.0E		
P556	ASKON 061745N 0262537E		
	PEDOS 094018N 0290715E		
	SISOR 124543N 0313859E		
	ELULA 143253N 0330853E		
	IMLAS 173413N 0354541E		
	BOGUM 200636N 0380300E		
P557	NUBAR 220000N 0313806E	~~UP557~~	~~NUBAR 220000N 0313806E~~
	*Note 7 (NABSI-NUBAR)		~~*Note 6&7~~
	ALKED 222152N 0313052E		
	ORLEX 225732N 0311859E		
	DESDO 251932N 0303034E		
	VUTAB 252648N 0302802E		
	IMLAX 252924N 0302707E		
	MEVDA 254818N 0302029E		
	DAVIX 262034N 0300904E		
	TUDSI 264114N 0300128E		
	MISUK 290507N 0290621E		~~MISUK 290507N 0290621E~~
	LOTOB 293510N 0290601E		
	~~KATAB 292501N0290506E~~OBRAN 302957N 0290522E		~~KATAB 292501N0290506E~~
	GOMGO 311152N 0290446E		
	NABSI 314353N 0290419E		
P559	RASLI 315424N 0383648E	~~UP559~~	~~RASLI 315424N 0383648E~~
	TURAIF (TRF) 314136N 038440~~5~~8E		~~TURAIF (TRF) 314136N 0384405E~~
	*Note 7 ~~to~~ (~~DESDI~~TRF-VUTEB)		~~*Note 7 to (TRF-DESDI)~~
	KAVID 303552N 0401147E		~~KAVID 303552N 0401147E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	GADLI 302312N 0403821E		
	DELNI 300448N 0411627E		
	TOKLU 294213N 0420220E		~~TOKLU 294213N 04202204E~~
	LUDEP 290948N 0430646E		
	RASMO 285713N 0433119E		~~RASMO 285713N 0433119E~~
	LOTOK 280834N 0450402E		
	KING SAUD AIR BASE (KMC) 275250N 0453321E		~~KING SAUD AB (KMC) 275250N 0453321E~~
	BOTEP 274420N 0461425E		
	RADGI 272640N 0473708E		
	~~ULOVO 274830N 0455420E~~ALPOT 271841N 0480511E		~~ULOVO 274830N 0455420E~~
	*Note 8 (ULOVO-NAPLO)		~~*Note 8 (ULOVO-NAPLO)~~
	~~MUSKO 272640N 0473708E~~SILBA 270554N 0485301E		~~MUSKO 272640N 0473708E~~
	KURKA 270449N 0491636E		
	~~KEDAT 272149N 0475901E~~EGREX 270433N 0492158E		~~KEDAT 272149N 0475901E~~
	~~JUBAIL (JBL) 270222N 0492426E~~		~~JUBAIL (JBL) 270222N 0492426E~~
	DAROR 270244N 0495815E		~~DAROR 270244N 0495815E~~
	RAMSI 270249N 0500714E		~~RAMSI 270249N 0500714E~~
	GASSI 270257N 0502229E		~~GASSI 270257.9N 0502229.5E~~
	KOBOK 265839N 0503349E		~~KOBOK 265839N 0503349E~~
	~~BOXOG 265403N 0504553E~~DEBEN 265254N 0504856E		~~BOXOG 265403N 0504553E~~
	DAVRI 264936N 05057~~1~~2E		~~DAVRI 264936N 0505731E~~
	SODAK 264634N 0510530E		~~SODAK 264634N 0510530E~~
	DANOB 263946N 0512640E		~~DANOB 263946N 0512640E~~
	BOTOB 263350N 0514505E		~~BOTOB 263350N 0514505E~~
	ROSAN 263129N 0515220E		~~ROSAN 263129N 0515220E~~
	KUMLA 262609N 0520822E		~~KUMLA 262609N 0520822E~~
	ASPAK 262115N 0522257E		~~ASPAK 262115N 0522257E~~
	UKUBU 261428N 0524039E		
	TOMSO 260611N 0530214E		~~TOMSO 260611N 0530214E~~
	NALPO 255602N 0532945E		~~NALPO 255602N 0532945E~~
	~~RAPSA 253700N 0541700E~~SOKAK 255131N 0534251E		~~RAPSA 253700N 0541700E~~
	~~DESDI 253603N 0544230E~~KIVUS 254522N 0540032E		~~DESDI 253603N 0544230E~~
	PUSOT 253919N 0542011E		
	AMBOV 253439N 0543512E		
	VUTEB 253644.6N 0545149.4E		
P560	PORT SUDAN (PSD) 311743N 0321416E	~~UP560~~	~~PORT SUDAN (PSD) 311743N 0321416E~~
	BOGUM 200736N 0380360E		~~BOGUM 200736N 0380360E~~
	AL BAHA (BHA) 2017833N 04137845E		~~AL BAHA (BHA) 2017833N 04137845E~~
	KITAP 224928N 0522923E		~~KITAP 224928N 0522923E~~
	~~PORT SUDAN (PSD) 311743N 0321416E~~		~~PORT SUDAN (PSD) 311743N 0321416E~~
P561	BENINA (BNA) 320728N 0201513E	~~UP561~~	~~BENINA (BNA) 320728N 0201513E~~
	KATAB 292501N 0290506E		~~KATAB 292501N 0290506E~~
P562	DEESA 294509N 0364102E	~~UP562~~	~~DEESA 294509N 0364102E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	ENABI 290739N 0385650E		~~ENABI 290739N 0385650E~~
	TAMRO 283938N 0424147E		~~TAMRO 283938N 0424147E~~
	LOTOK 280857N 0450512E		~~LOTOK 280857N 0450512E~~
P563	HAIL (HIL) 272530N 041405~~8~~9E	~~UP563~~	~~HAIL (HIL) 272630N 0414158E~~
	PASAM 273145N 0345642E		~~PASAM 273145N 0345642E~~
	HURGHADA (HGD) 271140N 0334847E		~~HURGHADA (HGD) 271140N 0334847E~~
P565	KAFIA 084400N 0233100E		
	LOPON 100606N 0240338E		
	GINKA 124701N 0250831E		
	HAMID 140400N 0254023E		
	EGSUM 185726N 0274545E		
	ATMUL 220000N 0290530E		
P566	VATEN 153358N 0323312E		
	KAREP 151838N 0313308E		
	ASNON 150818N 0305312E		
	DELAM 144001N 0290644E		
	ELFASHER (FSR) 133554.09N 0251810.66E		
	ILBIB 123242N 0222700E		
P567	KAMAR 323900N 0604400E		
	BIRJAND (BJD) 32582~~1~~0.7N 0591200.5E	~~UP567~~	~~BIRJAND (BJD) 325821N 0591200E~~
	PATEN 340825N 0572334E		
	DAPIN 342034N 0570413		
	ALROT 351116N 0554136E		
	ITELO 353534N 0550052E		
	ODKAT 354~~0.6~~650N 054~~57.2~~4146E		~~ODKAT 3540.6N 05457.2E~~
	DASHT-E-NAZ (DNZ) 36385~~5~~3.6N 0531120.1E		~~DASHT-E-NAZ (DNZ) 363855.7N 0531120.4E~~
	DASEL 371113N 0522020E		
	RIGAN 373543N 0514052E		
	ULDUS 380000N 0510100E		~~(ULDUS 3800.00N 05101.00E)~~
	(NETON 394542N 0481142E)		~~NETON 394542.7N 0481142.7E~~
	~~BARUS 415414.2N 0425030.5E~~		~~BARUS 415414.2N 0425030.5E~~
P568	EPLAS 040000N 0341148E		
	KUNDI 083920N 0313819E		
	PEBOR 095738N 0305437E		
	RAMKO 102439N 0303926E		
	JEBRA 125520N 0291349E		
	DEBOX 144424N 0281037E		
	BOXIG 155958N 0272606E		
	ELUXO 182038N 0260126E		
	EMAMU 191646N 0252654E		
	ORNAT 200000N 0250000E		
P570	~~TRIVENDRUM (TVM) 082831N 0765531E~~	~~UP570~~	~~TRIVENDRUM (TVM) 082831N 0765531E~~
	~~POMAN 115605.1N 0715958200.0E~~		~~POMAN 115605.1N 0715958200.0E~~
	~~LATEB 171704.1N 06422.02E~~(TEGOR 183503.30N 0623002.70E)		~~LATEB 171704.1N 06422.02E~~
	KITAL 200300N 0601800E		~~KITAL 2003.00N 06018.00E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	GOLNI 210014N 0594130E		
	TAVKO 211519N 0593147E		
	BONOM 213636N 0591800E		
	EMURU 221357N 0585338E		
	TOLDA 224008N 0583624E		
	GIDAN 230104N 0582232E		
	ITURA 232351N 0580720E		
	MIXAM 234139N 0575523E		~~MIXAM 234139N 0575523E~~
~~P562~~ P572	KISAL 101811N 0232526E		
	GAILY 123030N 0270639E		
	VATEN 153358N 0323312E		
P574	~~(BELGAUM) BBM~~(BOLIS 203333N 0650002)	~~UP574~~	~~(BELGAUM) BBM~~
	~~(BISET 1823.4N 06918.1E)~~		~~(BISET 1823.4N 06918.1E)~~
	TOTOX 215030N 0622230E		~~TOTOX 215030N 0622230E~~
	LOSIM 223513N 0603238E		
	KAXEM 225103N 0595243E		
	MUSRU 230256N 0592223E		
	PAROK 231030N 0590245E		
	*Note 7 (~~OM, OO~~PAROK-SERSA)		~~*Note 7 (OM, OO)~~
	KUSRA 231726N 058~~5102~~2611E		~~KUSRA 231726N 0585102E~~
	MIXAM 23413~~8~~9N 057552~~5~~3E		~~MIXAM 234138N 0575525E~~
	DAPOK 235956N 0572959E		
	EMATA 242309N 0565721E		
	SOLUD 243223N 0564421E		~~SOLUD 243223N 0564421E~~
	PUXIL 244117N 0563145E		
	GISMO 244743N 0562236E		~~GISMO 244743N 0562236E~~
	~~BUBIN 245742N 0560642E~~MIVEK 245240N 0561516E		~~BUBIN 245742N 0560642E~~
	~~TUKLA 2519.36N 0554010.2E~~IMPED 245824.5N 0560406.2E		~~TUKLA 2519.36N 0554010.2E~~
	NORGA 250352N 0555415E		
	RUKOR 250823N 0554603E		
	SERSA 251945N 0553118E		
	TOVIV 253302N 0551942E		
	KUMUN 254000N 0551512E		~~KUMUN 254000N 0551512E~~
	PAPAR 264000N 0542700E		~~PAPAR 264000N 0542700E~~
	SHIRAZ (SYZ) 293224.6N 052352~~20~~19.6E		~~SHIRAZ (SYZ) 293224N 0523520E~~
	ASNIT 303854N 0520948E		
	OBTUX 312223N 0515242E		
	LOXAK 314454N 0514344E		
	EGPAT 323330N 0512409E		
	IMRAG 325142N 0511643E		
	PEKAM 332904N 0510118E		
	EGVEL 344258N 0503005E		
	SAVEH (SAV) 35010~~7~~6.8N 0502217~~7~~6.9E		~~SAVEH (SAV) 350107N 0502217E~~
	SOGOL 350829N 0503128E		
	RUDESHUR (RUS) 352643.7N 0505419.3E		
	TEHRAN (TRN) 354149.1N 0511701.6E		
	NAGMO 360214N 0512055E		

	LOWER/UPPER AIRSPACE		**~~UPPER AIRSPACE~~**
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	DANEB 362001N 0512408E		
	NOSHAHR (NSR) 363946.1N 0512751.4E		
	ULEXI 374344N 0510631E		
	ULDUS 380000N 0510100E		~~ULDUS 380000N 0510100E~~
	(IBRUT 413524N 0510354E)		
P634	LALDO 251806N 0563600E	~~UP634~~	~~LALDO 251806N 0563600E~~
	*Note 7		~~*Note 7~~
	ATBOR 251007N 0551947E		~~ATBOR 251007N 0551947E~~
P693	AL AHSA (HSA) 25164~~4~~5N 0492902~~2~~3E	~~UP693~~	~~AL AHSA (HSA) 251644N 0492902E~~
	LADBO 242004N 0511411E		
	*Note 8 to BUNDU		~~*Note 8 to BUNDU~~
	BATHA (BAT) 241257N 0512707E		~~BATHA (BAT) 241257N 0512707E~~
	DEMTA 241926N 0513533E		~~BUNDU 250024N 0522924E~~
	BUNDU 250024N 0522924E		
P699	~~ATBOR 251007N 0551947E~~TUKSI 252006N 0560525E	~~UP699~~	~~ATBOR 251007N 0551947E~~
	*Note 7 (~~ATBOR~~TUKSI-BAH)		~~*Note 7 (ATBOR-BAH)~~
	PAVAG 251546N 0554042E		
	IVOXI 251239.6N 0552513.1E		
	TUDIS 251009N 0550825E		
	EGTAG 250856N 0545652E		
	NABIX 251241.1N 0543147.3E		
	~~SITAT 251105N 0544500E~~MOBUL 251559N 0541841E		~~SITAT 251105N 0544500E~~
	~~KISAG 251834N 0541408E~~VEGEK 251837N 0540803E		~~KISAG 251834N 0541408E~~
	~~ITMUS 252322N 0535429E~~RAGDO 252212N 0535106E		~~ITMUS 252322N 0535429E~~
	~~ALSOK 252607N 0533904E~~OXARI 252535N 0533458E		~~ALSOK 252607N 0533904E~~
	~~RUBAL 252957N 0531723E~~IMGUX 252950N 0531428E		~~RUBAL 252957N 0531723E~~
	ORMID 253354N 0525434E		~~ORMID 253354N 0525434E~~
	*Note 8 (ORMID-KFA)		~~*Note 8 (ORMID-KFA)~~
	DASLO 254537N 0523029E		~~DASLO 254537N 0523029E~~
	~~NAGOG 255214N 0521614E~~ALKAN 255214N 0521615E		~~NAGOG 255214N 0521614E~~
	BONAN 26020~~0~~1N 0515505E		~~BONAN 260200N 0515505E~~
	VEDED 260558N 051462~~7~~8E		~~VEDED 260558N 0514627E~~
	KUNDO 261631N 0512325E		~~KUNDO 261631N 0512325E~~
	SOGAT 262029N 0511443E		~~SOGAT 262029N 0511443E~~
	RIKET 261952N 0510954E		
	ASTAD 261812N 0505646E		~~ASTAD 261812N 0505646E~~
	BAHRAIN (BA~~H~~R) 2615~~51~~30N 0503~~856~~919E		~~BAHRAIN (BAH) 261551N 0503856E~~
	NARMI 261802N 0501939E		~~NARMI 261802N 0501939E~~
	KING FHAD (KFA) 262153N 0494910E		~~KING FHAD (KFA) 262153N 0494910E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
P708	LONOS 283027N 0491713E		
	ORGEL 281312N 0494614E		
	DATEN 273118N 0501832E		
	REVAX 272026N 0502651E		
	GETAL 270410N 0504040E		
	DEBEN 265254N 0504856E		
	RASDI 260425N 0512407E		
	VELAM 255426N 0514347E		
	VUTAN 255016N 0515218E		
	RESAR 253707N 0522328E		
	ALSEM 252703N 0524322E		
	OVONA 252443N 0524739E		
~~T975~~ P715	KUVER 280925N 0500600E		
	*Note 7 (MESVI-KUVER)		
	ALNIN 283306N 0501036E		
	KHARK ISLAND (KHG) 291550.0N 0501900.7E		
	MESVI 311057N 0500006E		
P751	(ARLOS 343731N 0225959.40E)		
	AMIBO 3456.7N 2136.4E	~~UP751~~	~~AMIBO 3456.7N 2136.4E~~
	~~SIDI BARANI (BRN) 313432N 0260020E~~METRU 340000N 0250900E		~~SIDI BARANI (BRN) 313432.5N 0260020.3E~~
	*Note 7 (KUNKI-METRU)		
	~~KATAB 292501N 290506E~~MERSA MATRUH (MMA) 311911N 0271320E		~~KATAB 2925.01N 290506.1E~~
	DASUM 310802N 0273234E		
	TAKRI 292503N 0290432E		
	KUNKI 290726N 0291949E		
	ASYUT (AST) 270152N 0310157E		~~ASYUT (AST) 270152.9N 0310157.9E~~
	LUXOR (LXR) 254458N 0324607E		~~LUXOR (LXR) 254458N 0324607E~~
	DANOG 251341N 0330905E		
	UMINI 234900N 0341006E		
	ALEBA 220000N 0352700E		~~ALEBA 2200.00N 03527.00E~~
	TOMRU 204411N 0361950E		
	PORT SUDAN (PSD) 192404.12N 0371430.21E		~~PORT SUDAN (PSD) 192404N 0371430E~~
	[ASMARA] *Note 1 151704N 0385403E		~~[ASMARA] *Note 1 151704N 0385403E~~
	TOKAR 180624N 0374812E		~~TOKAR 180624304.0N 03748124238.8E~~
	DEKRA 123924N 0431544E		
	PARIM 123142N 0432712E		~~PARIM 123142.7N 04327.12E~~
	ARABO 123852N 0440401E		
	DIRAK 124211N 0442113E		
	ADEN (KRA) 124952.20N 0450125E		~~ADEN (KRA) 124952N 0450125E~~
	RABOL 125856N 0454119E		
	MIXAN 132222N 0472427E		
	SEPRO 132824N 0475035E		
	AMBOD 133357N 0481527E		
	SOKEM 134235N 0485329E		
	PAXED 135027N 0492759E		
	XANLO 135653N 0495628E		
	ORBAT 140638N 0503924E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	RIGAM 143932N 0530414E		
	DAPAB 151115N 0552354E		
	ANGAL 161404N 0600004E		~~ANGAL 161404.1N 0600004.1E~~
	~~MUMBAI (BBB) 190511N 0725229E~~(MAMIG 161404N 0600004E)		~~MUMBAI (BBB) 190511N 0725229E~~
P752	ALSIR 165804N 0471248E		
	UKPAD 165415N 0471848.60E		
	ALSOD 164203.60N 0473753.40E		
	NADAK 161935.40N 0481259.40E		
	DANIN 160543.80N 0483437.80E		
	SAYUN (SYN) 155742.64N 0484710.18		
P753	PADUR 172958N 0473825E		
	TASBI 165853N 0481118E		
	XALTA 163546.20N 0483545E		
	GIBAX 162047N 0485137E		
P891	~~MAGALA (MGA) 261720N 0471225E~~MUSRI 261647N 0474137E	~~UP891~~	~~MAGALA (MGA) 261720N 0471225E~~
	*Note 7 (MUSRI~~to~~-KUA)		~~*Note 7 to KUA~~
	MEDGO 264433N 0475257E		
	GESOR 270322N 0475751E		
	KEDAT 272149N 0475901E		
	~~KUTEM 264359N 0473521E~~IVOBA 274138N 0480219E		~~KUTEM 264359N 0473521E~~
	~~EGNOV 270301N 0474713E~~KEBOK 274951N 0480341E		~~EGNOV 270301N 0474713E~~
	~~EMILU275031N 0475943E~~		~~EMILU 275031N 0475943E~~
	KUNRU 283220N 0481050E		~~KUNRU 283220N 0481050E~~
	KUWAIT (KUA) 291~~306~~457N 0475~~903~~717E		~~KUWAIT (KUA) 291306N 0475803E~~
P899	MIXAM 234139N 0575523E	~~UP899~~	~~MIXAM 234139N 0575523E~~
	*Note 7 (MIXAM-KUPSA)		~~*Note 7 to KUPSA~~
	VELOD 234611N 0573435E		
	PAXIM 240245N 0561631E		~~PAXIM 240245N 05617631E~~
	ITRAX 241248N 0554749E		~~ITRAX 241248N 0554749E~~
	~~AL AIN (ALN)~~VAVIM 241535.1N 0553623~~3~~2.9E		~~AL AIN (ALN) 241535N 0553623E~~
	~~ABU DHABI (ADV) 242508N 0544024E~~ROVOS 241825.0N 0552143.0E		~~ABU DHABI (ADV) 242508N 0544024E~~
	~~DASLA N243747N.8 E0533248E.8~~SIXIV 242009N 0550439E		~~DASLA N243747N.8 E0533248E.8~~
	~~VEBAT N244830N.5 E05251.00E~~UMIBU 242331N 0543027E		~~VEBAT N244830N.5 E05251.00E~~
	~~MEKMA N245430 E0522506~~MEKRI 243122.8N 0535500.0E		~~MEKMA N245430N E0522506E~~
	*Note 8 (OB)		~~*Note 8 (OB)~~
	~~KUPSA N250445 E0521151~~KUMSI 245050N 0523619E		~~KUPSA N250445N E0521151E~~
	MEKMA 245430N 0522505~~5~~6E		
	KUPSA 250445N 0521151E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
P975	~~(ELAZIG) EZS 384230N 0391327E~~	~~UP975~~	~~(ELAZIG) EZS 384230N 0391327E~~
	~~*Note7~~		~~*Note7~~
	~~DIYARBAKIR (DYB) 384225N 0391328E~~(LEKRO 371638.80N 0405817.30)		~~DIYARBAKIR (DYB) 384225N 0391328E~~
	LESRI 370420N 0411348E		~~LESRI 370420N 0411348E~~
	SIDNA 363~~3~~458N 0414159E		~~SIDNA 3633584.0N 0414159.0E~~
	TUBEN 351724N 0425434E		~~TUBEN 351724N 0425434E~~
	MUTAG 343003N 0433834E		~~MUTAG 343003N 0433834E~~
	*Note 7 (MUTAG-LONOS)		
	SOGUM 341212N 0435454E		~~SOGUM 341212N 0435454E~~
	PUTSI 333200N 0443700E		
	SINKA 332137N 0444753E		~~SINKA 332137N 0444753E~~
	NOLDO 324932N 0452129E		~~NOLDO 324932N 0452129E~~
	~~*Note 7~~		~~*Note 7~~
	KATUT 323737N 0453439E		~~KATUT 323737N 0453439E~~
	DENKI 322228N 0455122E		~~DENKI 322228N 0455122E~~
	ILMAP ~~312133N 0465702E~~351724N 0460921E		~~ILMAP 312133N 0465702E~~
	~~PEBAD 305023N 0472958E~~ULDUR 305023N 0472958E		~~PEBAD 305023N 0472958E~~
	SIDAD 295231N 0482944E		~~SIDAD 295231N 0482944E~~
	~~LOVAR 292424N 04846069E~~EGVAL 292448N 0484545E		~~LOVAR 292424N 0484606E~~
	~~SESRA 2908003N 04854543E~~SESRU 290900N 0485450E		~~SESRA 290800N 00485454E~~
	DANAL 2851~~30~~28N 04904~~48~~50E		~~DANAL 285130N 0490448E~~
	IMDOX 28345~~4~~5N 049143~~6~~8E		~~IMDOX 283454N 0491436E~~
	LONOS 283027N 0491713E		~~LONOS 283027N 0491713E~~
	ORGEL 281312N 0494614E		~~ORGEL 281312N 0494614E~~
	DATEN 273118N 0501832E		~~DATEN 273118N 0501832E~~
	REVAX 272026N 0502651E		~~REVAX 272026N 0502651E~~
	GETAL 270409N 0504039E		~~GETAL 270409N 0504039E~~
	LOSIS 270118N 0504208E		~~LOSIS 270118N 0504208E~~
	BOXOG 265403N 0504553E		~~BOXOG 265403N 0504553E~~
	NABOS 264354N 0505145E		~~NABOS 264354N 0505145E~~
	TOTIS 261119N 0511026E		~~TOTIS 261119N 0511026E~~
R2	ATMUL 220000N 0290527E	~~UR2~~	~~ATMUL 220000N 0290527E~~
	TULOP 252209N 0262226E		~~TULOP 252209N 0262226E~~
	DITAR 265903N 0250000E		~~DITAR 265903N 0250000E~~
	ARADA 304636N 0213348E		
	BENGHAZI BENINA (BNA) 320728N 0201513E		
R205	ANARAK (ANK) 333215N 0534347E	~~UR205~~	~~ANARAK (ANK) 333215N 0534347E~~
	BIRJAND (BJD) 325821N 0591200E		~~BIRJAND (BJD) 325821N 0591200E~~
R219	KUKLA 341438.34N 03444476.8E	~~UR219~~	~~KUKLA 341438.6N 0344447.8E~~
	KALDE (KAD) 33482~~7~~6.70N 03529~~10~~9.53E		~~KALDE (KAD) 334827N 0352910E~~
R401	~~AMPEX 08 1000N 055 0000E~~(EKBEL 112256N 0550000E)	~~UR401~~	~~AMPEX 08 1000N 055 0000E~~
	SUHIL 120000N 0550000E		~~SUHIL 120000N 0550000E~~
	BOTEM 135413N 0551418E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	~~DAPAP 151115N 0552354E~~DAPAB 151115N 0552354E		~~DAPAP 151115N 0552354E~~
	KIVEL 165306N 0553633E		~~KIVEL 165306N 0553633E~~
	ERDAX 175903N 0554458E		~~ERDAX 175903N 0554458E~~
	DEDSO 185811N 0560041E		
	HAIMA (HAI) 195813.3N 05616510.82E		~~HAIMA (HAI) 195813N 0561651E~~
	VELIK 203322N 0561656E		
	*Note 7 (VELIK-GABKO)		
	ALNUN 211625N 0561041E		
	SUTLI 220121N 0560404E		
	DATBU 222243N 0560054E		
	~~DEMKI 224941N 0562308E~~KATAK 224811N 0555708E		~~DEMKI 224941N 0562308E~~
	~~MUSAP 241754N 0555245E~~LABSA 230153N 0555505E		~~MUSAP 241754N 0555245E~~
	~~GIDIS 243600N 0555600E~~DOLFI 233253N 0555024E		~~GIDIS 243600N 0555600E~~
	~~ANVIX 244655N 0555616E~~KURTA 234205N 0554900E		~~ANVIX 244655N 0555616E~~
	~~AVAMI 250554N 0555647E~~MUSAP 241754N 0555245E		~~AVAMI 250554N 0555647E~~
	~~ULUSA 254925N 0555010E~~PEDOG 242225.4N 0555333.7E		~~ULUSA 254925N 0555010E~~
	GIDIS 243600.0N 0555600.0E		
	ANVIX 244655.0N 0555616.0E		
	NORGA 250352N 0555415E		
	~~SOGUR 255221N 0554943E~~ITBON 251426N 0555257E		~~SOGUR 255221N 0554943E~~
	~~*Note7 Eastbound (SOGUR-KHM)~~MISEG 252134N 0555205E		~~*Note7 Eastbound (SOGUR-KHM)~~
	ITLAP 254925N 0555010E		
	ASNEK 255630.7N 0554904.7E		
	GABKO 260404N 0554755E		~~GABKO 260404N 0554755E~~
	~~GHESHM (KHM) 264547N 0555428E~~		~~GHESHM (KHM) 264547N 0555428E~~
R402	LAKLU 232235N 0570401E	~~UR402~~	~~LAKLU 232235N 0570401E~~
	KUNGO 230034N 0565850E		
	NALKI 224928N 0565614E		
	*Note 7 (~~OO~~NALKI-HAI)		~~*Note 7 (OO)~~
	MOGOK 215057N 0564236E		
	TUBSA 204029N 0562626E		
	HAIMA (HAI) 195813.31N 05616510.82E		~~HAIMA (HAI) 195813N 0561651E~~
R462	~~JIWANI (JI) 250350N 0614744E~~(BIVIN 250350N 0614744E)	~~UR462~~	~~(JIWANI) (JI) 250350N 0614744E~~
	METBI 245556N 0612816E		
	DENDA 24423024N 0605451E		~~DENDA 244230.5N 0605451.8E~~
	EGTAL 243458N 0603724E		
	ASLOM 242113N 0600552E		
	MIXOL 240523N 0592959E		
	ALSAS 240054N 0591955E		
	VUSET 235540N 0590812E		~~VUSET 235540N 0590812E~~
	*Note 7 (~~OO~~VUSET-MIXAM)		~~*Note 7 (OO)~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	MIXAM 234139N 0575523E		~~MIXAM 234139N 0575523E~~
R611	KHARTOUM (KTM) 153357.93N 0323312.16E		
	EMITA 142130N 0334444E		
	TIKAT 122418N 0353812E		
R650	ASRAB 254726N 0330619E	~~UR650~~	~~ASRAB 254726.4N 0330619.3E~~
	KUSAT 264748N 0333617E		
	HURGHADA (HGD) 271040N 0334747E		~~HURGHADA (HGD) 271040N 0334747E~~
	IMLUX 273131N 0340323E		
	SHARM EL SHEIKH (SHM) 275953N 0342448E		~~SHARM EL SHEIKH (SHM)~~
	DELNA 283040N 0343212E		
	NUWEIBAA (NWB) 290156N 0344016E		~~NUWEIBAA (NWB) 290156N 0344016E~~
	NALSO 293210N 034525~~0~~42E		~~NALSO 2932.10N 03452503.0E~~
~~Z151~~ R651	DASUT 261832N 0531108E		
	VEKEL 261929N 0535738E		
	MIRIT 262013N 0545411E		
	ORPEN 263119N 0552008E		
	GHESHM ISLAND (KHM) 264547.1N 0555427.6E		
R652	ULINA 292451N 0345817~~7~~8E		
	METSA 292707N 0345903E		
	BAKIR 294053N 0350708E		
	QATIM 295600N 0351600E		
	LOXUS 301300.90N 0352600E		
	~~ROVAR 292438N0345711E~~LOSIL 304851.20N 0354741.31E	~~UR652~~	~~ROVAR 292438N0345711E~~
	QATRANEH (QTR) 311454.41N 0360334.31E		~~QATRANEH (QTR)~~
	EGLOT 311656.94N 0363214.16E		
	KULDI 311847.07N 0363214.16E		
	KIPAS 312320~~0~~4N 0370641E		~~KIPAS 312320N 0370641E~~
	GURIAT (GRY) 312445N 371712E		~~GURIAT (GRY)~~
	~~*Note 7(OE)~~		~~*Note 7(OE)~~
	TURAIF (TRF) 314136N 038440~~5~~8E		~~TURAIF (TRF)~~
	OVANO 314801N 0390951E		~~OVANO 3148.01N 0390951.8E~~
	*Note 7 (OVANO- GIBUX)		
	DAXAN 320512N 0393719E		
	KASIR 323954N 0403112E		
	GIBUX 330500N 0411100E		
	RAPLU 332300N 0414530E		
	GEPAP 334906N 0422851E		
	MUTAG 343003N 0433834E		
	~~IVANO~~DAVAS 351724N 0451235E		
R654	MAGRI 385408N 0462300E		
	DARUN 383339N 0464235E		
	GODNA 382033N 0465457E		
	BUDED 375313N 0472032E		
	DAMOS 372619N 0474521E		
	ZANJAN (ZAJ) 364647~~7~~6.8N 0482112~~2~~1.9E	~~UR654~~	~~MAGRI 385408N 0462300E~~

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	TULGU 362836N 0484235E		
	SAVEH (SAV) 35010~~7~~6.8N 050221~~7~~6.9E		~~ZANJAN (ZAJ) 364647N 0482112E~~
	EGVEL 344258N 0503005E		
	PEKAM 332904N 0510118E		
	ESFAHAN (ISN) 334449.1N 051494~~1~~0.8E		~~SAVEH (SAV) 350107N 0502217E~~
	LADAL 322226N 0525543E		
	TOVTA 320528N 0534421E		
	YAZD (YZD) 31535~~2~~1.6N 054165~~8~~7.7E		~~ESFAHAN (ISN) 334449N 0514941E~~
	BOMUN 313648N 0544555E		
	UKVEV 310557N 0553718E		
	ALMOB 303434N 0562824E		
	KERMAN (KER) 301~~706~~658.1N 0~~4~~56563~~7~~2.3E		~~YAZD (YZD) 315352N 0541658E~~
	ALKUL 295152N 0571535E		
	PEDUK 285920N 0575447E		
	~~NABOD 2816.1N 05825.3E~~NABOX 281630N 0582601E		~~KERMAN (KER) 301706N 0465637E~~
	LADPA 265331N 0592514E		
	DUGLI 264014N 0593431E		
	NAGES 262451N 0594514E		
	EGPER 255210N 0600737E		
	CHAH BAHAR (CBH) 252641.9N 0602451.7E		~~NABOD 2816.1N 05825.3E~~
	EGPIC 2508~~.6~~11N 060~~29.5~~3730E		~~CHAH BAHAR (CBH)~~ ~~EGPIC 2508.6N 06029.5E~~
	DENDA 2442~~30~~24N 0605451E		~~DENDA DENDA 244230N 0605451E~~
R655	~~(LARNACA) (LCA) 345222N 0333732E~~(KOBER 344437N 0340624E)	~~UR655~~	~~(LARNACA) (LCA) 345222N 0333732E~~
	BALMA 342856.30N 0350302.30E		
	CHEKA (CAK) 34180~~2~~1.81N 0354~~200~~159.64E		~~CHEKA (CAK) 341802N 0354200E~~
	CEDAR 341713.20N 0360004.30E		
	LEBOR 341556N 0363514E		
	KARIATAIN (KTN) 341248N 0371551E		~~KARIATAIN (KTN) 341248N 0371551E~~
R659	TEHRAN (TRN) 354149.1N 051170~~2~~1.6E	~~UR659~~	~~TEHRAN(TRN) 354149N 0511702E~~
	*Note 7 (ISN-TRN)		~~*Note 7 (ISN-TRN)~~
	BOXAM 343749N 0515147E		~~BOXAM 343749N 0515147E~~
	VAVIN 341709N 0520247E		
	DAPOG 333744N 0522331E		~~DAPOG 333744N 0522331E~~
	*Note 3 (DAPOG-SYZ)		~~*Note 3 (DAPOG-SYZ)~~
	ESFAHAN (ISN) 324449.1N 0514940.8E		
	GIDEN 320039N 0520026E		
	GESIP 314556N 0520359E		
	KAVOT 304111N 0521922E		
	SHIRAZ (SYZ) 293224.6N 05235~~20~~19.6E		~~SHIRAZ (SYZ) 293224N 0523520E~~
	LAGSA 283306N 0522056E		
	KATAG 282346N 0521841E		
	*Note 7 (KATAG- EMISA)		
	DURSI 271219N 0520144E		
	KAVAM 265737N 0515818E		
	MIDSI 264142N 0515442E		~~MIDSI 264142N 0515442E~~
	*Note 8 (MIDSI-DOH)		~~*Note 8 (MIDSI-DOH)~~
	~~*Note 7 (MIDSI-VELAM)~~		~~*Note 7 (MIDSI-VELAM)~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SOGAN 263915N 0515408E		~~SOGAN 263915N 0515408E~~
	ROSAN 263129N 0515220E		~~ROSAN 263129N 0515220E~~
	~~DASOS 262430N 0515043E~~BOPOV 262430N 0515043E		~~DASOS 262430N 0515043E~~
	RABLA 261506N 0514834E		~~RABLA 261506N 0514834E~~
	VEDED 260558N 0514628E		~~VEDED 260558N 0514628E~~
	VELAM 255426N 0514347E		~~VELAM 255426N 0514347E~~
	EMISA 254658N 0514207E		~~EMISA 254658N 0514207E~~
	DOHA/HAMAD ~~INTL~~ (DOH) 251459.66N 051363~~5~~4.80E		~~DOHA HAMAD INTL (DOH) 251459N 0513635E~~
R660	(ERZURUM (ERZ) 395724N 0411226~~6~~5.70E)	~~UR660~~	~~(ERZURUM) (ERZ) 395724N 0411226E~~
	DASIS 38543~~1~~5N 04412~~29~~30E		~~RASHT (RST) 371935N 0493657E~~
	BORES 382829N 0452137E		
	VUVAG 382529N 0452926E		
	TABRIZ (TBZ) 380853.5N 046124~~7~~6.6E		~~TEHRAN (TRN) 354149N 0511702E~~
	RAKED 375621N 0470712E		
	BUDED 375313N 0472032E		
	RALGO 372840N 0490112E		
	RASHT (RST) 37193~~5~~4.8N 0493657.1E		
	DEDLA 365620N 0500044E		
	NABAX 360955N 0504816E		
	TEHRAN (TRN) 354149N 0511702E		
R661	DULAV 3857~~.0~~00N 0453~~7.9~~800E	~~UR661~~	~~DULAV 3857.0N 04537.9E~~
	RABDI 384804N 0454431E		
	SIBVU 384444N 0454657E		
	TABRIZ (TBZ) 380853.5N 046124~~7~~6.6E		~~TABRIZ (TBZ) 380853N 0461247E~~
	RUDAD 374045N 0465741E		
	ZANJAN (ZAJ) 364647~~7~~6.8N 048211~~2~~1.9E		~~ZANJAN (ZAJ) 364647N 0482112E~~
	SUTBU 363324N 0484732		
	MIVAK 355915N 0495324E		
	RUDESHUR (RUS) 35264~~4~~3.7N 0505419.3E		~~RUDESHUR (RUS) 352644N 0505419E~~
	IMAM KHOMAINI (IKA) 352434.8N 0511042.5E		
	VARAMIN (VR) 35203~~4~~3.6N 0513814~~4~~3.8E		~~VARAMIN (VR) 352034N 0513814E~~
	DEHNAMAK (DHN) 35151~~4~~5N 052431~~3~~2E		~~DEHNAMAK (DHN) 351514N 0524313E~~
~~Z675~~ R665	SOMAD 372645N 0543255E		
	LOVEN 363926N 0553355E		
	IBRAV 362041N 0555430E		
	MUSEG 354656N 0562631E		
	IMKUK 345602N 0571346E		
	TASLU 342531N 0574131E		
	BIRJAND (BJD) 325820.7N 0591200.5E		
~~Z670~~ R670	DASIS 385435N 0441230E		
	REXUS 385624N 0451332E		
	DULAV 385700N 0453800E		
R674	SABEL 185158N 0520339E	~~UR674~~	~~SABEL 185158N 0520339E~~

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	LOTEL 180926N 0514103E		~~LOTEL 180926N 0514103E~~
	PASUL 180341N 0513803E		~~PASUL 180341N 0513803E~~
	GOGRI 170752N 0510857E		~~GOGRI 170752N 0510857E~~
	OBTAS 164633N 0505756E		~~OBTAS 164633N 0505756E~~
	RARBA 161021N 0503920E		~~RARBA 161021N 0503920E~~
	UKORA 152407N 0501547E		~~UKORA 152407N 0501547E~~
	NAKAD 150056N 0500402E		~~NAKAD 150056N 0500402E~~
	DANAN 144010N 0495334E		~~DANAN 144010N 0495334E~~
	XABIL 142924N 0494809E		~~XABIL 142924N 0494809E~~
	EMABI 141627N 0494139E		~~EMABI 141627N 0494139E~~
	PAXED 135027N 0492759E		~~PAXED 135027N 0492759E~~
	DEMGO 120258N 0483040E		~~DEMGO 120258N 0483040E~~
R775	DEDLI 224232N 0373719E		
	DASPA 230121N 0370841E		
	SEDVA 235813N 0354006E		
	ELELI 251854N 0332934E		
	LUXOR (LXR) 254458N 0324607E		
R777	DANAK 160800N 0412900E	~~UR777~~	~~DANAK 1608.00N 04129.00E~~
	LAKNA 160000N 0420000E		
	GOBLO 154050N 0432550E		
	IMKAR 153511N 0435039E		
	SANAA (SAA) 15~~3000~~2959.60N 044131~~1~~0.60E		~~SANA'A (SAA) 153000N 0441311E~~
	PAVEN 144602N 0441112E		
	EGNOL 140745N 0440929E		
	TAIZ (TAZ) 134150N 0440819E		~~TAIZ (TAZ) 134150N 0440819E~~
	ARABO 123852N 0440401E		~~ARABO 123852.8N 04404.01E~~
	TORBA 121036N 0440206E		~~TORBA 1210.36N 0440206.1E~~
R784	~~SHARJAH (SHJ) 251945N 0553118E~~KUSEN 251828.0N 0562340.0E	~~UR784~~	~~SHARJAH (SHJ) 251945N 0553118E~~
	*Note 7 (ORSAR-KUSEN)		
	EMOPI 252620.0N 0560900.0E		
	ALSIL 252911.1N 0554639.4E		
	TOVIV 253302N 0551942E		
	ALRAR 254058.2N 0550149.4E		
	GONVI 254239.8N 0545630.5E		
	TATLA 254753N 0544008E		
	EMOTA 255254N 0542414E		
	GIBIB 255507N 0541712E		
	ORSAR 260430N 0535730E		~~ORSAR 260430 .5N 0535730.5E~~
	LEVNA 261535N 0533857E		
	EGMIT 263340N 0530825E		
	*Note 8 (OM)		~~*Note 8 (OM)~~
	PEGET 270434N 0521515E		
	DURSI 271219N 0520144E		~~DURSI 271219.3N 0520144.7 E~~
	IMDAT 274100N 0511100E		~~IMDAT 27410.0N 05111003.0E~~
	ALNIN 28330~~5~~6N 0501036E		~~ALNIN 28330540.9N 050103601.6E~~
	NANPI 290457N 0493157E		~~NANPI 290457N 0493157E~~
	*Note 7 (SIDAD-NANPI)		
	DESLU 292800N 0490150E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	SIDAD 295231N 0482944E		~~SIDAD 295231N 0482944E~~
R785	TURAIF (TRF) 314146N 0384408.10	~~UR785~~	~~TURAIF (TRF)~~
	RASLI 315424N 0383648E		
	KAREM 325110.40N 0380324.38E		
	ZELAF 325700N 0380000E		~~ZELAF 3256567.0N 0371121800.0E~~
	ABBAS 332610N 0374320E		
	BASEM 333352N 0373938E		
	KARIATAIN (KTN) 341248N 0371551E		~~KARIATAIN (KTN) 341248N 0371551E~~
	BRAVO 344118N 0363500E		
	BANIAS (BAN) 3513~~42~~62N 0355729E		~~BANIAS (BAN) 351342N 0355729E~~
	DELTA 351228N 0354916E		
	NIKAS 351136N 0354300E		~~NIKAS 3511.36N 03543.00E~~
R794	ULDUS 380000N 0510100E	~~UR794~~	~~ULDUS 3800.00N 05101.00E~~
	ULEXI 374344N 0510631E		
	NOSHAHR (NSR) 3639~~35~~46.1N 0512~~805~~751.4E		~~NOSHAHR (NSR) 363935N 0512805E~~
	DEHNAMAK (DHN) 3515145N 052431~~3~~2E		~~DEHNAMAK (DHN) 351514N 0524313E~~
	~~TABAS (TBS) 334021N 0565331E~~		~~TABAS (TBS) 334021N 0565331E~~
	~~BIRJAND (BJD) 325821N 0591200E~~		~~BIRJAND (BJD) 325821N 0591200E~~
	~~*Note 5 (OI)~~		~~*Note 5 (OI)~~
R799	IMPOS 1831367N 0511848 E	~~UR799~~	~~IMPOS 183136N 0511848 E~~
	PASUL 180341N 0513803E		~~PASUL 180341N 0513803E~~
	TONRO 165850N 0522235E		~~TONRO 165850N 0522235E~~
	ASMAK 162327N 0524634E		~~ASMAK 162327N 0524634E~~
	ENADO 153333N 0532015E		~~ENADO 153333N 0532015E~~
T444	*Note 9		
	ROTOX 283323N 0494809E		
	*Note 7 (DENVO-ROTOX)		
	GEPUT 281307N 0493423E		
	DAMUR 280137N 0492638E		
	GIRSI 274126N 0493311E		
	ORDAN 271706N 0495442E		
	RAMSI 270249N 0500714E		
	LOTOR 264854N 0502200E		
	EGMOR 264211N 0502907E		
	DESBU 263240N 0503241E		
	ELOSO 262409N 0503551E		
	BAHRAIN (BHR) 261530N 0503919E		
	TULUB 260644N 0510041E		
	DENVO 260452N 0510509E		
T602	*Note 9		
	TUMAK 255031N 0531108E		
	*Note 7 (TUMAK-RAGAS)		
	VEDOM 260109N 0524456E		
	ORLUP 260651N 0523216E		
	VELAK 261307N 0521821E		
	LABOP 261907N 0520429E		
	ALTOM 262230N 0515639E		

	LOWER/UPPER AIRSPACE		~~UPPER AIRSPACE~~
Designator	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
	BOPOV 262430N 0515043E		
	ALMOK 262832N 0513840E		
	GITBO 263527N 0511750E		
	VEDOS 264106N 0510045E		
	MOGAS 264800N 0503909E		
	TOLMO 265504N 0502927E		
	EGLIT 270256N 0502006E		
	TOKMA 270939N 0501159E		
	ORSOL 272135N 0500208E		
	ITNAS 274644N 0493957E		
	GODRI 280257N 0494308E		
	ROTOX 283323N 0494809E		
T665	*Note 9		
	ULDUN 262429N 0560924E		
	KAVEG 261608N 0552434E		
	MENDI 254955N 0550522E		
	DAPER 254522N 0545731E		
	*Note 7 (DOH-DAPER)		
	KUSBA 251633.60N 0532847.40E		
	RORON 252052.80N 0530915.60E		
	OVONA 252443.20N 0524739.60E		
	DOHA/HAMAD (DOH) 251459.66N 0513634.80E		
~~Z350~~ T970	*Note 9		
	ITURA 232351N 0580720E		
	*Note 7 (ITURA-IVIVA)		
	IVIVA 245945N 0574958E		
	KATUS 251600N 0574700E		
	GIGAB 253708N 0573231E		
	NOVSU 263407N 0573849E		
	BONIK 264444N 0562651E		
	MOBET 264406N 0560908E		
	GHESHM ISLAND (KHM) 264547.1N 0555427.6E		
	SERDU 264715N 0545757E		
	ROSUM 264741N 0543637E		
	LAVAN ISLAND (LVA) 264843.4N 0532121.1E		
	DURSI 271219N 0520144E		
	KAVAM 265737N 0515818E		
	MIDSI 264142N 0515442E		
~~Z151~~ T980	*Note 9		
	GHESHM ISLAND (KHM) 264547.1N 0555427.6E		
	ULDUN 262429N 0560924E		
	BOTOV 252812N 0564307.80E		
	GIDIL 251742N 0564923E		
	BUBAS 245938N 0570003E		
	GERAR 240600N 0573616E		
	MIXAM 234139N 0575523E		

	LOWER/UPPER AIRSPACE		~~**UPPER AIRSPACE**~~
Designat or	Significant Points	~~Designator~~	~~Significant Points~~
1	2	~~1~~	~~2~~
~~M317~~ T990	*Note 9		
	RABEM 374841N 0452949E		
	KHOY (KHY) 382601.4N 0445758.9E		
	DASIS 385435N 0441230E		

ATS ROUTES NEED MORE COORDINATION

No.	ATS route and Challenge Description	Target date	Action	Champion and relevant FIR(s)	Supported by	Status / remarks
1.	A18 is from KDR to IMN (HLLL/DAAA) It's not in Regional ATS route table		- Requested to add ANP-ATS table	ATM SG, Libya	MID AIM SG	Not requested by Libya to add
2.	A21 is established from TAN to KTN which entirely located in Damascus FIR		- Change the ATS route designator (non-regional)	ATM SG, Syria	MID AIM SG	Requested from Syria to change designator as non-regional
3.	A403, this route is divided in two parts inside Libya: - GRT to BRACK is available - BRACK to SEB interrupted - SEB to TUMMO (FIR boundary) with designator A403F is available and extended in FTTT. It's not in Regional ATS route table			ATM SG, Libya	MID AIM SG	Not requested by Libya to add
4.	A418 was from PAPAR to KUMUN deleted			ATM SG, Iran, UAE	MID AIM SG	
5.	A422 was from PARSU to KARAD deleted			ATM SG, Iran, Azerbaijan	MID AIM SG	
6.	A424 was from LOVEK to LOTAN deleted			ATM SG, KSA, Iraq	MID AIM SG	
7.	B15 is from BALMA (FIR boundary) to KRD It's not in Regional ATS route table		- Requested to add ANP-ATS table	ATM SG, Lebanon	MID AIM SG	No request was received from Lebanon
8.	B21 is from INDOT (FIR Boundary) to MB, then it's continued from DAYFA to ORNAT (FIR boundary) as B21F It's not in Regional ATS route table		- Requested to add ANP-ATS table	ATM SG, Libya	MID AIM SG	No request was received from Libya

9.	B400 from VEDET to MOGDU			ATM SG, Somalia	MID AIM SG	This segment already renamed
10.	B412 from HLF to JDW			ATM SG, KSA	MID AIM SG	This segment already renamed
11.	B413 from ZIZAN to AVIMO			ATM SG, Somalia	MID AIM SG	This segment already renamed
	The segment from PSD-LADEN is not in ANP		- Requested to add ANP-ATS table	ATM SG, Sudan		No request was received from Sudan
12.	B416 from ORSAR to DESDI was renamed			ATM SG, UAE	MID AIM SG	This segment already renamed
13.	B441 is from OTRUZ (FIR boundary) to NABOX The segment from OTRUZ to MARAD was deleted			ATM SG, Iran, Turkmenistan, ICAO EUR/NAT	MID AIM SG	This segment already removed
14.	B451 was from DEBER to ASB deleted			ATM SG, Turkmenistan ICAO EUR/NAT	MID AIM SG	This segment already removed
15.	B538 is established from ALE to KTN which entirely located in Damascus FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Syria	MID AIM SG	Requested by Syria to change designator to non-regional
16.	G2 is from ELIKA to KAD It's not in Regional ATS route table		- Requested to add ANP-ATS table	ATM SG, Lebanon	MID AIM SG	No request was received from Lebanon
17.	G202 was from DAM to KAD entirely deleted The segment between VELOX to KAD was renamed			ATM SG, Syria, Lebanon, Cyprus	MID AIM SG	

18.	G655F is from SEB (SEBHA) to GARIN (FIR boundary) and extended in FTTT FIR with designator UG655 On the other side, with designator G655 from SEB to FARES (FIR boundary) and extended through DTTC and DAAA It's not in Regional ATS route table		- Requested to add ANP-ATS table	ATM SG, Libya	MID AIM SG	No request was received from Libya
19.	G659 is established from MTG to SARIR (GS) which entirely located in Tripoli FIR It's not in Regional ATS route table.		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	Request Libya to change designator as non-regional
20.	G660 is from WLD to SRT (SIRTE) entirely located inside Tripoli FIR.		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	Request Libya to change designator as non-regional
21.	G661 is from MIS (MISRATA) to HON entirely located inside Tripoli FIR It is not in Regional ATS route table.		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	Request Libya to change designator as non-regional
22.	G662 is from NAGDA to HON entirely located inside Tripoli FIR ~~This designator also repeated in ATS route table from BUSRA (OJAC) to KIA (OEJD)~~		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	Request Libya to change designator as non-regional
23.	G663F is from SEB (SEBHA) to GS (SARIR) entirely located inside Tripoli FIR.		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	Request Libya to change designator as non-regional
24.	G665,The segment between AAR to ABD is not available			ATM SG, Iraq	MID AIM SG	
	- HON to DHR entirely located inside of Tripoli FIR.		- Change the ATS route designator (non-regional)	ATM SG, Libya		Request Libya to change designator as non-regional

25.	G667, The segment between ABD and ALSAM was removed in Baghdad FIR			ATM SG, Iraq	MID AIM SG	
26.	G670 from LALDA to GYD removed			ATM SG, Azerbaijan	MID AIM SG	
27.	G674 is established from BPN to PMA, which entirely located in Jeddah FIR.		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	
28.	G739 is from GAD to TAZIT entirely located inside Tripoli FIR		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	
29.	G775 was from ORPAB to ASB renamed			ATM SG, Turkmenistan	MID AIM SG	
30.	G781 was from BONAM to VAN renamed			ATM SG, Turkey	MID AIM SG	
31.	G792 was from GIRUN to BODKA renamed			ATM SG, Turkmenistan	MID AIM SG	
32.	G795 was from BSR to RAF deleted			ATM SG, Iraq	MID AIM SG	
33.	G799 is established from PMA to ELONU which entirely located in Jeddah FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	
34.	G855 is established from GAD (GHADAMES) to IZD (MIZDA) which entirely located in Tripoli FIR		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	Request Libya to change designator as non-regional
35.	G858 is established from SEB to DEKIL (FIR boundary) and extended inside of FTTT FIR It’s not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya

36.	H732 is established from LADNA (FIR boundary) to EMUSA		- Change the ATS route designator (non-regional) - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
37.	H741 is established from ASVIR (FIR boundary) to KFA		- Change the ATS route designator (non-regional) - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
38.	J735 is established from NARMI (FIR boundary) to TAYMA		- Change the ATS route designator (non-regional) - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
39.	J749 is established from ROTEL (FIR boundary) to MIBRA		- Change the ATS route designator (non-regional) - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
40.	J852 is established from SILKA (FIR boundary) to GETOT		- Change the ATS route designator (non-regional) - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
41.	J874 is established from IMRAD (FIR boundary) to MUSRI		- Change the ATS route designator (non-regional) - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
42.	L12 is established from TONBA (FIR boundary) to LOTIN (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
43.	L124 was from VAN to BONAM			ATM SG, Turkey	MID AIM SG	This route has been renamed
44.	L126 was from PUSTO to ILM			ATM SG, Iraq, Iran	MID AIM SG	This route has been renamed
45.	L223 was from TARDI to LAKLU			ATM SG, Oman	MID AIM SG	This route has been renamed

46.	L306 is established from LAKLU to TOKRA			ATM SG, Oman	MID AIM SG	This route was removed
47.	L308 is established from DAROR to EGPIC			ATM SG, Bahrain, UAE, Oman, Pakistan	MID AIM SG	This route was renamed
48.	L310 was from BOXAK to LALDO			ATM SG, UAE, Oman	MID AIM SG	This route has been renamed
49.	L417 is established from VUSEB to MUTAG which entirely located in Baghdad FIR MUTAG-NADOX was deleted			ATM SG, Iraq	MID AIM SG	
50.	L438 was from LONOS to ASTAD			ATM SG, Bahrain	MID AIM SG	This route has been deleted and replaced by other route
51.	L440 was from KANIP to RETAS			ATM SG, UAE	MID AIM SG	This route has been deleted and replaced by other route
52.	L443 was from RABAP to GASSI			ATM SG, Bahrain	MID AIM SG	This route has been deleted and replaced by other route
53.	L444 is established from KIPOL to TOLDA which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	
54.	L552 is established from NABUN to RUKOR which entirely located inside UAE FIR		- Change the ATS route designator (non-regional) **- Subject to review**	ATM SG, UAE		UAE requested to add ANP (ATM SG/7)
55.	L562 is established from ALRAR to SERSA which entirely located inside of UAE		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)

56.	L563 is established from MAHDI to IMDUR which entirely located inside of Sudan FIR		- Change the ATS route designator (non-regional)	ATM SG, Sudan	MID AIM SG	
57.	L565 is from BOSEV to UKUVO which entirely located inside of UAE		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
58.	L566 is established from DATEG to ASMAK which entirely located in Sanaa FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Yemen	MID AIM SG	Yemen requested to keep this route as a part of ANP
59.	L568 is from KIPOK to IMPED which entirely located inside of UAE		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
60.	L572 is from KML to TAN which entirely located inside of Syria		- Change the ATS route designator (non-regional)	ATM SG, Syria	MID AIM SG	
61.	L573 was established from DFN to WEJ			ATM SG, Saudi Arabia	MID AIM SG	This route has been deleted
62.	L602, this have the following segments: - GEPAP-ELEXI (Baghdad/Damascus FIR boundary) has been suspended in Baghdad FIR - ELEXI to GAZ (Ankara FIR) was deleted			ATM SG, Syria, Iraq, Turkey	MID AIM SG	
63.	L604, NARMI-TOSNA renamed			ATM SG, Bahrain	MID AIM SG	
64.	L695 is established from PAROK to ITURA which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	
65.	L715 is established from GIBUX to LOVEK which entirely located in Baghdad FIR		- Change the ATS route designator (non-regional)	ATM SG, Iraq	MID AIM SG	

66.	L718 is established from ALPET to INB (Two FIRs)		- Requested to add ANP- ATS route table	ATM SG, Iraq	MID AIM SG	No request was received from Iraq
67.	L764 was from MCT to PAXIM			ATM SG, Oman	MID AIM SG	This route has been deleted & replaced
68.	M1 is from BNA to RASNO (FIR boundary) and extended It’s not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
69.	M7 is from BONAR (FIR boundary) to TONBA (FIR boundary) It’s not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
70.	M203 is established from PUSTO to ILMAP which entirely located in Baghdad FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Iraq	MID AIM SG	
71.	M214 is established from SEB to GARIN (FIR boundary) and extended inside FTTT It’s not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
72.	M215 is established from TONBA (FIR boundary) to LUMED (FIR boundary) and extended in both side FTTT and LMMM It’s not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
73.	M302 is from REVAV to GERUL which entirely located in UAE FIR It’s not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
74.	M303 is established from MCT to KIPOL which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	
75.	M305 was from BRN to ATMUL (FIR boundary) deleted			ATM SG, Egypt	MID AIM SG	This route has been deleted and

						replaced by other route
76.	M309 is established from KIA to VEMEM which entirely located in Jeddah FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	
77.	M312 was from DBA to AMIBO			ATM SG, Egypt, Malta, Libya	MID AIM SG	This route has been deleted
78.	M316 is established from KATUS to GOKSO which entirely located in Tehran FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Iran	MID AIM SG	
79.	M319 is established from ULINA to MOUAB which entirely located in Amman FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Jordan	MID AIM SG	
80.	- This route was already in Kuwait and KSA, but the segment KFA-ASVIR was renamed to H741			ATM SG, Saudi Arabia		Request from Saudi Arabia to rename H741 to M320
81.	M322 is from ITBUL to AMBOV which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
82.	M552 is from KAPUM to ALNEV which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
83.	M558 is from UKNAV to KUGTO which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)

84.	M560 is from ORNEL to ELUDA which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
85.	M569 is from VUTEB to OBREV which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
86.	M573 is established from TRN to TBZ which entirely located in Tehran FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Iran	MID AIM SG	Request Iran to change designator as non-
87.	M600 was from RANBI to KISAG removed			ATM SG, UAE	MID AIM SG	This route segment has been renamed
88.	M600 repeated for route from IMN (DAAA) to SARKI (FIR boundary) and extended inside of LMMM FIR.		- Change the ATS route designator (non-regional)	ATM SG, Libya	MID AIM SG	Also no request received from Libya to add in ANP
89.	M620 is established from KFR to BONAR (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
90.	M621 is established from BNA to OLMAX (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
91.	M622 is established from BNA to INDOT (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
92.	M681 is established from DAMUM to TARBO which entirely located in Bahrain FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Bahrain	MID AIM SG	
93.	M703 is established from GADSI to PASIP (FIR boundary)		- Requested to add ANP- ATS route table	ATM SG, Iraq	MID AIM SG	No request was received from Iraq

	It's not in Regional ATS route table					
94.	M726 is established from MTG to SARKI (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
95.	M727 is established from DEKIL (FIR boundary) to ABRAM (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
96.	M731 is established from FARES (FIR boundary) to DEKIL (FIR boundary) and extended in both side DTTC and FTTT It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
97.	M732 is established from DATIR (FIR boundary) to ELIMO (FIR boundary) and extended inside of LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
98.	M740 is established from SEB to SARKI (FIR boundary) and extended inside of LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
99.	M861 was from ELEXI to DRZ removed			ATM SG, Syria	MID AIM SG	This route segment has been renamed
100.	M872 from KIA to MIDSI renamed			ATM SG, KSA, Bahrain		This route segment has been renamed
101.	M877 is established from VUSET to KUSRA which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	

102.	M979 is established from LAB to INDOT (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
103.	M980 is established from LOSUL (FIR boundary) to BONAR (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
104.	N68 is established from MB to OLMAX (FIR boundary) It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
105.	N303 From RIBOK to LABNI renamed			ATM SG, KSA		This route segment has been renamed
106.	N310 From LATEB to BASEM renamed (Syria) The segment BALMA to CAK renamed too (Lebanon)			ATM SG, Syria, Lebanon		This route segment has been renamed
107.	N313 is from MITIX to PAVAG which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
108.	N315 From SITOL to KIA removed			ATM SG, KSA		This route segment has been renamed
109.	N324 From GOBRO to ASTUN removed			ATM SG, Oman		This route segment has been renamed
110.	N430 is established from ITLOB to TARBO which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	

111.	N563 ALPOB-GIBUS renamed			ATM SG, Bahrain, KSA		This route segment has been renamed
112.	N566 is from EGTAG to RORON which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
113.	N569 TOKRA-BONUM renamed			ATM SG, KSA		This route segment has been renamed
114.	N571 ALPOB-BPN renamed			ATM SG, Bahrain, KSA		This route segment has been renamed
115.	N638 was from KIA to PMA			ATM SG, Saudi Arabia	MID AIM SG	This route already deleted and new route was published
116.	N694 was from KIA to HFR			ATM SG, Saudi Arabia	MID AIM SG	This route already deleted and new route was published
117.	N929 was from DASLO to GIBUS			ATM SG, Bahrain, Saudi Arabia	MID AIM SG	This route already deleted and new route was published
118.	P32 is established from SEB to EKLIS (FIR boundary) and extended inside of LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
119.	P126 is established from GARIN (FIR boundary) to LUMED (FIR boundary) and extended inside LMMM It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya

120.	P128 is established from LOSUL (FIR boundary) to TANLI (FIR boundary) and extended inside DTTC It's not in Regional ATS route table		- Requested to add ANP- ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
121.	P304 is established from EMISO to VELIK which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	
122.	P308 is from ASPED to ORKOB which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
123.	P311 is from IVOXI to NABUN which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
124.	P316 is established from SLL to MCT which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	
125.	P317 is from RURAL to LORID which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
126.	P321 is from TOVIV to NOLSU which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
127.	P324 is established from GNA to DELAM which entirely located in Sudan FIR It's not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, Sudan	MID AIM SG	
128.	P425 was from DHA to ALSER FIR boundary			ATM SG, Bahrain, Saudi Arabia	MID AIM SG	This route was deleted
129.	P430 is established from DOH to ALTOM which entirely located in Bahrain FIR		- Change the ATS route designator (non-regional)	ATM SG, Bahrain, Qatar	MID AIM SG	

			- deletion from ANP-ATS route table			
130.	P513 is established from BUBAS to MCT which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	
131.	P517 is established from DEKOB to EMARO which entirely located in Jeddah FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	
132.	P552 is established from DATEG to IMPOS which entirely located in Sanaa FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Yemen	MID AIM SG	
133.	P553 is from DAXIB to IMGUX which entirely located in UAE FIR It’s not in Regional ATS route table		- Change the ATS route designator (non-regional)	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
134.	P560 was from PSD to BHA then KITAP			ATM SG, Saudi Arabia, Sudan	MID AIM SG	This route already deleted
135.	P561 was from BNA to KATAB			ATM SG, Egypt	MID AIM SG	This route already deleted
136.	P562 was from DEESA FIR boundary to LOTOK entirely renamed as non-regional ATS route Y415			ATM SG, Saudi Arabia	MID AIM SG	This route already deleted and renamed
137.	P563 was from HIL to HGD			ATM SG, Egypt, Saudi Arabia	MID AIM SG	This route already deleted
138.	P574 was from PAPAR to KUMUN FIR boundary deleted			ATM SG, Iran, UAE	MID AIM SG	
139.	P634 was from LALDO to ATBOR			ATM SG, Oman, UAE	MID AIM SG	This route was already deleted
140.	P634 was from NARMI to KFA			ATM SG, KSA	MID AIM SG	This route was already renamed

141.	P751, this route divided in two parts: - BRN to TOKAR (FIR boundary) - DEKRA (FIR boundary) ANGAL (FIR boundary) The deleted segment is named as A451/UA451 in Asmara FIR			ATM SG, Eritrea, Ethiopia	MID AIM SG	Request from ICAO ESAF to ask Eritrea & Ethiopia to change route designator to P751
142.	P752 the segment NADKI (Jeddah/Sanaa FIR) to ALSIR (Jeddah/Sanaa FIR) is located inside Jeddah FIR with designator Non-regional ATS route designator Q624		- Change the ATS route designator	ATM SG, , Saudi Arabia	MID AIM SG	- Request form Saudi Arabia to rename Q624 (PATOG-ALSIR) to P752.
143.	P753 This route is continued in Jeddah FIR with Non-regional ATS route designator Q615		- Change the ATS route designator	ATM SG, Saudi Arabia	MID AIM SG	- Request form Saudi Arabia to rename Q615 (ASKET-PADUR) to P753.
144.	P975 was from LESRI to TOTIS The segment LESRI-MUTAG is removed The segment LONOS-TOTIS was renamed Y604			ATM SG, Syria, Iraq, Bahrain	MID AIM SG	This route was already removed & renamed
145.	Q21 is established from DUDRI (FIR boundary) to MEDMO		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
146.	Q143 is established from ULADA (FIR boundary) to MEDGO		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
147.	Q212 is established from NARMI (FIR boundary) to KIA		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
148.	Q332 is established from PEKEM (FIR boundary) to MEPPO		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
149.	Q510 is established from PASAM (FIR boundary) to GEPAG		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia

150.	Q615 is established from PADUR (FIR boundary) to ASKET		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
151.	Q620 is established from PARAR (FIR boundary) to AMBOS		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Oman	MID AIM SG	No request was received from Oman
152.	Q624 is established from ALSIR (FIR boundary) to PATOG		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
153.	Q666 is from EGPOG to GIDOB which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator	ATM SG, UAE	MID AIM SG	UAE requested to add ANP (ATM SG/7)
154.	Q733 is established from ORNAT (FIR boundary) to KUVTI		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Sudan	MID AIM SG	- No request was received from Sudan
155.	Q978 is established from ITRAX (FIR boundary) to MCT		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Oman	MID AIM SG	- No request was received from Oman
156.	R23 is established from HIL to TRF which entirely located in Jeddah FIR		- Change the ATS route designator (non-regional)	ATM SG, Saudi Arabia	MID AIM SG	Requested by KSA to add ANP
157.	R205 was from ANK to BJD entirely deleted			ATM SG, Iran	MID AIM SG	
158.	R402 is established from HAI to LAKLU which entirely located in Muscat FIR		- Change the ATS route designator (non-regional) - deletion from ANP-ATS route table	ATM SG, Oman	MID AIM SG	
159.	R778 is from CVO to LAG (Five FIRs)		- Requested to add ANP-ATS route table	ATM SG, Egypt, Libya	MID AIM SG	- No requested by Egypt & Libya to add
160.	R799 is established from ENADO to IMPOS which entirely located in Sanaa FIR		- Change the ATS route designator (non-regional)	ATM SG, Yemen	MID AIM SG	Yemen requested to keep this route as a part of ANP

			- deletion from ANP-ATS route table			
161.	R845 is from GRT to GASRI (FIR boundary) and extended in DTTC FIR as UR845 It's not in Regional ATS route table		- Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
162.	T100 is established from GOBRO (FIR boundary) to KUTNA		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
163.	T136 is established from ULADA (FIR boundary) to EMUSA		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
164.	T142 is established from DARTI (FIR boundary) to LADBO		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
165.	T238 is established from KABLA (FIR boundary) to JUB		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Sudan	MID AIM SG	No request was received from Sudan
166.	T295 is established from NAWRS to ABRAM (FIR boundary)		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
167.	T297 is established from ABU to VARIG (FIR boundary) and extended inside LMMM		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
168.	T299 is established from ZAW to VARIG (FIR boundary) and extended inside LMMM		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
169.	T513 is established from RASKA (FIR boundary) to JDW		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
170.	T800 is from DOH to ULDUN (Two FIRs)		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Bahrain, Iran, Qatar,	MID AIM SG	- UAE is not agree to establish as a

						permanent during ATM SG/7
171.	T891 is from ORKOB to NOLSU which entirely located in UAE FIR It's not in Regional ATS route table		- Change the ATS route designator	ATM SG, UAE	MID AIM SG	- UAE requested to add ANP (ATM SG/7)
172.	T934 is established from ROTOX (FIR boundary) to PATOM		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Bahrain, Qatar	MID AIM SG	- Request was received from Bahrain to consider as contingency - Qatar requested during ATM SG/7
173.	V13 is established from PASAM (FIR boundary) to AAR		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
174.	V300 is from BNA to TANLI (FIR boundary)		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
175.	V790 is established from PSD to FEREB (FIR boundary) and extended inside HHAA		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Sudan	MID AIM SG	No request was received from Sudan
176.	V975 is established from ULIKA (FIR boundary) to KIA		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
177.	W9 have two segments as below: - BNA to SEB (operational) - TAZIT to TWARG (FIR boundary) with designator 9WF. The segment between SEB to TAZIT is not available.		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	Should inform Libya in this regard to change designator as non-regional
178.	W147 is established from SIR (FIR boundary) to PRG		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Iran	MID AIM SG	No request was received from Iran

179.	W148 is established from PAMTU (FIR boundary) to KER		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Iran	MID AIM SG	No request was received from Iran
180.	W857 is established from SARKI (FIR boundary) to KFR		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
181.	W861 is established from IMN (inside DAAA FIR) to NASER		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
182.	Y415 is established from DEESA (FIR boundary) to LOTOK		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
183.	Y511 is established from TOKRA (FIR boundary) to PMA		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
184.	Y517 is established from KATOD (FIR boundary) to WDR		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Saudi Arabia	MID AIM SG	No request was received from Saudi Arabia
185.	Y613 is established from EPLAS (FIR boundary) to OBD		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Sudan	MID AIM SG	No request was received from Sudan
186.	Z178 is established from RASNO (FIR boundary) to DITAR (FIR boundary)		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	No request was received from Libya
187.	Z350 Same designator is used for the another route inside Libya from RASNO (FIR boundary) to MIS		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Libya	MID AIM SG	- No request was received from Libya
188.	Z855 is from SODEX (FIR Boundary) to TULBU		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Oman	MID AIM SG	No request was received from Oman
189.	Z980 is from TIKAT (FIR Boundary) to EMITA		- Change the ATS route designator - Requested to add ANP-ATS route table	ATM SG, Sudan	MID AIM SG	No request was received from Sudan

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MID REGION DUPLICATED 5LNCs REPORT

	Status	Number of Duplicates	States	Priority	Action	Champion	Supported by	Report to
1.	Duplication of 5LNC "**ALAMA**" FIR boundary	2	France, Oman/India	France	Remove duplication	Oman	ICAO APAC ICAO MID	AIM SG ATM SG
2.	Duplication of 5LNC "**ALPOT**" on airway M691 & P559	2	Saudi Arabia, Bahrain	Saudi Arabia	Remove duplication	Bahrain	ICAO MID	AIM SG ATM SG
3.	Duplication of 5LNC "**ALSAN**" on airway G667	2	Republic of Korea, Kuwait/Iraq (FIR boundary)	Kuwait	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
4.	Duplication of 5LNC "**ALSIR**" on airway P752 & Q624	2	Canada, Yemen/India	Canada	Remove duplication	ICAO MID	ICAO NACC	AIM SG ATM SG
5.	Duplication of 5LNC "**ALTEP**" on airway B544	2	UAE/Saudi Arabia	UAE	Remove duplication	Saudi Arabia	ICAO MID	AIM SG ATM SG
6.	Duplication of 5LNC "**AMATO**" on airway A727	2	Haiti, Sudan/Ethiopia	Haiti	Remove duplication	Sudan	ICAO ESAF ICAO MID	AIM SG ATM SG
7.	Duplication of 5LNC "**AMBAL**" on airway L425	2	Colombia, Saudi Arabia	KSA	Remove duplication	ICAO MID	SAM	AIM SG ATM SG
8.	Duplication of 5LNC "**AMBOD**" on airway P312 & P751	2	Yemen, Madagascar/Mauritius (FIR boundary)	Yemen	Remove duplication	ICAO MID	ESAF	AIM SG ATM SG
9.	Duplication of 5LNC "**ANVIX**" on airway L223	2	United Arab Emirates/Oman (FIR boundary), Seychelles	UAE	Remove duplication	ICAO MID	ESAF	AIM SG ATM SG
10.	Duplication of 5LNC "**ASKOL**" on airway M863	2	Sudan/Chad, Russian Federation	Sudan/Chad	Remove duplication	ICAO MID	ICAO EUR/NAT	AIM SG ATM SG

11.	Duplication of 5LNC “**ASPEL**” on airway G669	2	Kuwait, Japan	Kuwait	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
12.	Duplication of 5LNC “**BAKIR**” on airway R652	2	Turkey, Jordan	Turkey	Remove duplication	Jordan	ICAO MID	AIM SG ATM SG
13.	Duplication of 5LNC “**BALMA**” on airway L620 & R655	2	Cyprus/Lebanon (FIR boundary), Indonesia	Lebanon	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
14.	Duplication of 5LNC “**BASEM**” on airway R785	3	Republic of Korea, Syrian Arab Republic, Australia	Republic of Korea	Remove duplication	Syria	ICAO MID	AIM SG ATM SG
15.	Duplication of 5LNC “**BAYAN**” on airway P430	4	Bahrain/Qatar, Mongolia, Philippines	Mongolia	Remove duplication	Bahrain/Qatar	ICAO MID	AIM SG ATM SG
16.	Duplication of 5LNC “**BOGUM**” on airway G660	2	Sudan, Taiwan	Sudan	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
17.	Duplication of 5LNC “**BOMIX**” on airway B403	2	Yemen/Somalia, India	Yemen/Somalia	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
18.	Duplication of 5LNC “**BONAR**” on airway M620, M980, M9, M7	2	Libya/Malta (FIR boundary), Indonesia	Libya	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
19.	Duplication of 5LNC “**BRAVO**” on airway L513 & R785	4	China (Taiwan), India, Syrian Arab Republic, Brazil	Brazil	Remove duplication	Syria	ICAO MID	AIM SG ATM SG
20.	Duplication of 5LNC “**CEDAR**” on airway R655	6	Brazil, United Kingdom, Lebanon, Japan, Australia, China (Hong Kong)	UK	Remove duplication	Lebanon	ICAO MID	AIM SG ATM SG
21.	Duplication of 5LNC “**CLAMS**” on airway A411	2	United States of America, Libya	USA	Remove duplication	Libya	ICAO MID	AIM SG ATM SG

22.	Duplication of 5LNC "**DANAL**" on airway P975	2	Kuwait, Australia	Kuwait	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
23.	Duplication of 5LNC "**DANAN**" on airway B526 & R674	2	Yemen, Republic of Korea	Yemen	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
24.	Duplication of 5LNC "**DEKIL**" on airway M731, M727, G858, G727	2	Libya/Chad, Republic of Korea	To be determined by the 5LNC Duplicate Resolution Rules				
25.	Duplication of 5LNC "**DEKUM**" on airway B12, M568	2	South Sudan/Democratic Republic of the Congo (FIR boundary), United States of America	Sudan	Remove duplication	ICAO MID	FAA	AIM SG ATM SG
26.	Duplication of 5LNC "**DELAM**" on airway B612, P324, P566, P313, L320	2	Russian Federation, Sudan	Russian Federation	Remove duplication	Sudan	ICAO MID	AIM SG ATM SG
27.	Duplication of 5LNC "**DELTA**" on airway R785	7	Suriname, Japan, Vanuatu, Syrian Arab Republic, Bhutan, Liberia, Lao People's Democratic Republic, India	Suriname	Remove duplication	Syria	ICAO MID	AIM SG ATM SG
28.	Duplication of 5LNC "**DENSA**" on airway M561	2	Iran (Islamic Republic of), Japan	Iran	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
29.	Duplication of 5LNC "**DOLFI**" on airway R401	3	Peru, Libya, Oman	To be determined by the 5LNC Duplicate Resolution Rules				
30.	Duplication of 5LNC "**ELELI**" on airway M999	2	Egypt, Indonesia	Egypt	Remove duplication	ICAO MID	APAC	AIM SG ATM SG

31.	Duplication of 5LNC "**ENADA**" FIR boundary	2	Jordan, Oman/UAE	Jordan	Remove duplication	Oman/UAE	ICAO MID	AIM SG ATM SG
32.	Duplication of 5LNC "**FARES**" on airway B526, G665, M731, G13	3	Libya/Tunisia (FIR boundary), United States of America, Yemen/Eritrea (FIR boundary)	Libya	Remove duplication	ICAO MID Yemen	FAA ESAF	AIM SG ATM SG
33.	Duplication of 5LNC "**GASSI**" on airway P559	3	Philippines, United States of America, Bahrain	USA	Remove duplication	Bahrain	ICAO MID	AIM SG ATM SG
34.	Duplication of 5LNC "**GETUP**" on airway M449 & A412	2	Jordan, United States of America	Jordan	Remove duplication	ICAO MID	FAA	AIM SG ATM SG
35.	Duplication of 5LNC "**GIBAX**" on airway G652	2	Yemen, Ethiopia	Yemen	Remove duplication	ICAO MID	ICAO ESAF	AIM SG ATM SG
36.	Duplication of 5LNC "**GOMRI**" on airway B413 & L314	2	Yemen, Algeria	Yemen	Remove duplication	ICAO MID	ICAO EUR NAT	AIM SG ATM SG
37.	Duplication of 5LNC "**HAMED**" on airway A424	2	Yemen, Saudi Arabia	Yemen	Remove duplication	Saudi Arabia	ICAO MID	AIM SG ATM SG
38.	Duplication of 5LNC "**ITGEV**" on airway B525	2	Sudan/Ethiopia	To be determined by the 5LNC Duplicate Resolution Rules				
39.	Duplication of 5LNC "**KABAN**" on airway L718	2	Turkey/Iraq (FIR boundary), Philippines	Iraq	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
40.	Duplication of 5LNC "**KAMAR**" on airway G202	2	Afghanistan/Iran (Islamic Republic of) [FIR boundary], Japan	Iran	Remove duplication	ICAO MID	APAC	AIM SG ATM SG

41.	Duplication of 5LNC "**KAMEL**" on airway Q52	2	Jordan/Syria, Colombia	To be determined by the 5LNC Duplicate Resolution Rules				
42.	Duplication of 5LNC "**KANOK**" FIR boundary	2	Iraq/Syria, India	Iraq/Syria	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
43.	Duplication of 5LNC "**KAROX**" on airway B407	2	Sudan/Saudi Arabia, UAE	Sudan/Saudi Arabia	Remove duplication	UAE	ICAO MID	AIM SG ATM SG
44.	Duplication of 5LNC "**KARUB**" on airway M999	2	Indonesia, Libya	To be determined by the 5LNC Duplicate Resolution Rules				
45.	Duplication of 5LNC "**KASOL**" on airway B535 & N303	3	Iran (Islamic Republic of), Indonesia, Djibouti	Iran	Remove duplication	ICAO MID	APAC ESAF	AIM SG ATM SG
46.	Duplication of 5LNC "**KATAK**" on airway R401	3	Oman, Indonesia, Zimbabwe/Mozambique (FIR boundary)	To be determined by the 5LNC Duplicate Resolution Rules				
47.	Duplication of 5LNC "**KATAN**" on airway B535	2	Yemen, Indonesia	Yemen	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
48.	Duplication of 5LNC "**KAVIL**" on airway G665	2	Iran, Philippine	Iran	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
49.	Duplication of 5LNC "**KEPOS**" on airway M999	2	Madagascar, Libya	Madagascar	Remove duplication	Libya	ICAO MID	AIM SG ATM SG
50.	Duplication of 5LNC "**KILIS**" on airway B544	2	Brazil, Turkey/Syrian Arab Republic (FIR boundary)	Brazil	Remove duplication	Syria	ICAO MID	AIM SG ATM SG
51.	Duplication of 5LNC "**KISAL**" on airway N320, L320, P562	2	Central African Republic/Sudan (FIR boundary), Russian Federation	Sudan	Remove duplication	ICAO MID	EUR NAT	AIM SG ATM SG

52.	Duplication of 5LNC "**KITUB**" on airway G667	2	Saudi Arabia, Canada	Canada	Remove duplication	KSA	ICAO MID	AIM SG ATM SG
53.	Duplication of 5LNC "**KOBAS**" on airway B413	2	Eritrea/Saudi Arabia, Indonesia	Eritrea/Saudi Arabia	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
54.	Duplication of 5LNC "**KORAB**" on airway M651	2	France, Yemen	France	Remove duplication	Yemen	ICAO MID	AIM SG ATM SG
55.	Duplication of 5LNC "**KUNDO**" on airway P699	2	Bahrain, Indonesia	Bahrain	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
56.	Duplication of 5LNC "**KUMLA**" on airway P559	2	Bahrain, Sweden	Bahrain	Remove duplication	ICAO MID	ICAO EUR/NAT	AIM SG ATM SG
57.	Duplication of 5LNC "**LABAD**" on airway B544	2	Saudi Arabia, Indonesia	Saudi Arabia	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
58.	Duplication of 5LNC "**LABNA**" on airway L604	2	Egypt, Indonesia	Egypt	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
59.	Duplication of 5LNC "**LADEN**" on airway B413	2	Sudan/Eritrea (FIR boundary), Russian Federation	Sudan	Remove duplication	ICAO MID	EUR NAT	AIM SG ATM SG
60.	Duplication of 5LNC "**LATEB**" on airway N310 & P300	2	Lebanon/Syrian Arab Republic (FIR boundary), India	Lebanon/Syrian Arab Republic	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
61.	Duplication of 5LNC "**LITAN**" on airway N310 & P300	2	Lebanon/Cyprus, Indonesia	Lebanon/Cyprus	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
62.	Duplication of 5LNC "**LOSAR**" on airway L513	2	Jordan, Indonesia	Jordan	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG

63.	Duplication of 5LNC "**LOTOS**" on airway L564	3	Spain, Saudi Arabia, China (Taiwan)	Spain	Remove duplication	KSA	ICAO MID	AIM SG ATM SG
64.	Duplication of 5LNC "**LUGAT**" on airway M872	2	Ukraine, Egypt	Ukraine	Remove duplication	Egypt	ICAO MID	AIM SG ATM SG
65.	Duplication of 5LNC "**MAANI**" on airway G782	2	Saudi Arabia, Finland	Saudi Arabia	Remove duplication	ICAO MID	ICAO EUR/NAT	AIM SG ATM SG
66.	Duplication of 5LNC "**MAHDI**" on airway B407	2	Algeria, Sudan	Algeria	Remove duplication	Sudan	ICAO MID	AIM SG ATM SG
67.	Duplication of 5LNC "**MALLA**" on airway L513	2	UAS, Syria	UAS	Remove duplication	Syria	ICAO MID	AIM SG ATM SG
68.	Duplication of 5LNC "**MISAN**" on airway B544 & G667	2	Yemen, Viet Nam	Yemen	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
69.	Duplication of 5LNC "**MUNGA**" on airway A777	2	Oman, Australia	Oman	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
70.	Duplication of 5LNC "**NABIL**" on airway M574	2	Indonesia, India/Yemen (FIR boundary)	To be determined by the 5LNC Duplicate Resolution Rules				
71.	Duplication of 5LNC "**NAMLA**" on airway N300	2	Bahrain/UAE, Nadi[RA1]	Bahrain/UAE	Remove duplication	ICAO MID	ICAO SAM ICAO WACAF[RA2]	AIM SG ATM SG
72.	Duplication of 5LNC "**NANTO**" on airway G665	2	Iran (Islamic Republic of), Indonesia	Iran	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
73.	Duplication of 5LNC "**NARMI**" on airway B457	2	Morocco, Bahrain/Saudi Arabia (FIR boundary)	Morocco	Remove duplication	KSA Bahrain	ICAO MID	AIM SG ATM SG

74.	Duplication of 5LNC "**NASER**" on airway A411	2	Russian Federation, Libya	Russian Federation	Remove duplication	Libya	ICAO MID	AIM SG ATM SG
75.	Duplication of 5LNC "**NAZAR**" on airway A647	2	Iran/Turkmenistan, USA	Iran/Turkmenistan	Remove duplication	ICAO MID	ICAO NACC FAA	AIM SG ATM SG
76.	Duplication of 5LNC "**NODLA**" on airway G202	2	Iran (Islamic Republic of), Egypt	Iran	Remove duplication	Egypt	ICAO MID	AIM SG ATM SG
77.	Duplication of 5LNC "**ORBAT**" on airway N764 & P751	2	Tunisia, Yemen	Tunisia	Remove duplication	Yemen	ICAO MID	AIM SG ATM SG
78.	Duplication of 5LNC "**PADUR**" on airway Q615, P753	2	Panama/Central America, Saudi Arabia/Yemen	Panama/Central America	Remove duplication	Yemen Saudi Arabia	ICAO MID	AIM SG ATM SG
79.	Duplication of 5LNC "**PARAS**" on airway G208	2	Iran, Taiwan	Iran	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
80.	Duplication of 5LNC "**PAROT**" on airway G208	2	Iran (Islamic Republic of), Indonesia	Iran	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
81.	Duplication of 5LNC "**PASAK**" on airway M677	2	Bahrain, Cambodia	Bahrain	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
82.	Duplication of 5LNC "**PASOS**" on airway L550, W850	2	Egypt/Cyprus, Mexico	Egypt/Cyprus	Remove duplication	ICAO MID	ICAO NACC	AIM SG ATM SG
83.	Duplication of 5LNC "**PATOR**" on airway B417	2	Saudi Arabia, Indonesia	Saudi Arabia	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
84.	Duplication of 5LNC "**PAVON**" on airway M561	3	Venezuela, Mexico, Iran (Islamic Republic of)	Iran	Remove duplication	ICAO MID	NACC SAM	AIM SG ATM SG

85.	Duplication of 5LNC "**PETRA**" on airway B411 & M449	3	Thailand, China (mainland), Jordan	Thailand	Remove duplication	Jordan	ICAO MID	AIM SG ATM SG
86.	Duplication of 5LNC "**PRAWN**" on airway A411	4	Canada, Libya, China (Hong Kong), Australia	Canada	Remove duplication	Libya	ICAO MID	AIM SG ATM SG
87.	Duplication of 5LNC "**PURNA**" on airway A418	2	Iran, Indonesia	Iran	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
88.	Duplication of 5LNC "**RABOL**" on airway P751	2	Yemen, Indonesia	Yemen	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
89.	Duplication of 5LNC "**RAGAS**" on airway M561	2	Bahrain/Iran (Islamic Republic of) [FIR boundary], Ethiopia/Djibouti	Bahrain	Remove duplication	ICAO MID	ESAF	AIM SG ATM SG
90.	Duplication of 5LNC "**RAKID**" on airway M318 & M559	2	Saudi Arabia, Yemen	Saudi Arabia	Remove duplication	Yemen	ICAO MID	AIM SG ATM SG
91.	Duplication of 5LNC "**RASKI**" on airway L301	3	India/Oman (FIR boundary), Saudi Arabia, Iraq	Oman	Remove duplication	Saudi Arabia, Iraq	ICAO MID	AIM SG ATM SG
92.	Duplication of 5LNC "**RIBAM**" on airway G650	2	Saudi Arabia, Russian Federation	Saudi Arabia	Remove duplication	ICAO MID	ICAO EUR/NAT	AIM SG ATM SG
93.	Duplication of 5LNC "**SABEL**" on airway B424 & R674	2	Oman/Yemen (FIR boundary), Philippines	Oman	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
94.	Duplication of 5LNC "**SALAM**" on airway L200, A412	3	Israel/Jordan, Iraq, Indonesia	Israel/Jordan	Remove duplication	ICAO MID Iraq	ICAO APAC	AIM SG ATM SG
95.	Duplication of 5LNC "**SALIM**" on airway L601	2	United States of America, Syrian Arab Republic	USA	Remove duplication	Syria	ICAO MID	AIM SG ATM SG

96.	Duplication of 5LNC “**SALUN**” on airway L604	2	Egypt/Greece (FIR boundary), China (Taiwan)	Egypt	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
97.	Duplication of 5LNC “**SALWA**” on airway M430	2	United States of America, Saudi Arabia	USA	Remove duplication	KSA	ICAO MID	AIM SG ATM SG
98.	Duplication of 5LNC “**SINKA**” on airway G202	2	Iraq, Haiti	Iraq	Remove duplication	ICAO MID	NACC	AIM SG ATM SG
99.	Duplication of 5LNC “**SOFIA**” on airway G202	3	Brazil, Paraguay, Syrian Arab Republic	Brazil	Remove duplication	Syria	ICAO MID	AIM SG ATM SG
100.	Duplication of 5LNC “**SOKAL**” on airway L613 & A1	2	Egypt, Australia	Egypt	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
101.	Duplication of 5LNC “**SOKAN**” on airway L768	2	Jordan/Syrian Arab Republic (FIR boundary), Viet Nam	Jordan	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
102.	Duplication of 5LNC “**TAKMI**” on airway L566 & P323	2	Yemen, New Zealand	Yemen	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
103.	Duplication of 5LNC “**TAKTI**” on airway N687	2	Saudi Arabia, Bhutan	KSA	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
104.	Duplication of 5LNC “**TAMIM**” on airway B535	2	Yemen, Jordan	Yemen	Remove duplication	Jordan	ICAO MID	AIM SG ATM SG
105.	Duplication of 5LNC “**TANSA**” on airway B12	2	Egypt/Greece (FIR boundary), Philippines	Egypt	Remove duplication	ICAO MID	APAC	AIM SG ATM SG
106.	Duplication of 5LNC “**TAPOS**” on airway B535	3	Sudan, Indonesia, Congo	Sudan	Remove duplication	ICAO MID	APAC WACAF	AIM SG ATM SG

107.	Duplication of 5LNC "**TASMI**" on airway L602, G795	2	Iraq/Kuwait, Yemen	Iraq/Kuwait	Remove duplication	Yemen	ICAO MID	AIM SG ATM SG
108.	Duplication of 5LNC "**TESOS**" on FIR boundary	2	Botswana, Sudan/Kenia	Botswana	Remove duplication	Sudan	ICAO MID	AIM SG ATM SG
109.	Duplication of 5LNC "**TESVA**" on airway L852	2	Turkey/Iran, Finland	Turkey/Iran	Remove duplication	ICAO MID	ICAO EUR/NAT	AIM SG ATM SG
110.	Duplication of 5LNC "**TOBLI**" on airway A453	2	Bolivia (Plurinational State of), Bahrain	Bolivia	Remove duplication	Bahrain	ICAO MID	AIM SG ATM SG
111.	Duplication of 5LNC "**TOTOX**" on airway P574	2	Oman/India, Vietnam	Oman/India	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG
112.	Duplication of 5LNC "**UBTEN**" on FIR boundary	2	Botswana, Yemen/Somalia	Botswana	Remove duplication	Yemen	ICAO MID	AIM SG ATM SG
113.	Duplication of 5LNC "**VELOS**" on airway G662	2	Saudi Arabia, Philippine	Saudi Arabia	Remove duplication	ICAO MID	ICAO APAC	AIM SG ATM SG

MID DOC 014

INTERNATIONAL CIVIL AVIATION ORGANIZATION

MID REGION

AIR TRAFFIC FLOW MANAGEMENT

IMPLEMENTATION PLAN

Version 2.0 (Draft) Oct 2021

This Plan was developed by the ICAO MID Air Traffic Flow Management Task Force (ATFM/TF) and reviewed by the ATM SG.

Approved by MIDANPIRG/xx and published by the
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RECORD OF AMENDMENTS

Edition Date	Description	Pages Affected
February 2021	First Draft Edition (Version 1.0)	ATFM CONOPS
February 2022	Second Edition (Version 2.0)	Restructured Doc 014 in 3 parts, Framework & common operating procedures and implementation Guidance parts are added to CONOPS

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Glossary

1- Abbreviations and Acronyms

AAR	Aerodrome Arrival Rate or Airport Acceptance Rate
ABI	Advanced Boundary Information
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
A-CDM	Airport Collaborative Decision Making
ACP	Acceptance
ADOC	Aircraft Direct Operating Cost
ADP	AFTM Daily Plan
ADS-B	Automatic Dependent Surveillance-Broadcast
ADS-C	Automatic Dependent Surveillance-Contract
ADR	Airport Departure Rate
AFIX	Arrival Fix
AFS	Aeronautical Fixed Service
AFTN	Aeronautical Fixed Telecommunications Network
ATFM	Air Traffic Flow Management
AIBT	Actual In Block Time
AIDC	ATS Inter-facility Data Communications
AIGD	ICAO ADS-B Implementation and Guidance Document
AIM	Aeronautical Information Management
AIRAC	Aeronautical Information Regulation and Control
AIRD	ATM Improvement Research and Development
AIS	Aeronautical Information Service
AIXM	Aeronautical Information Exchange Model
ALDT	Actual Landing Time
AMAN	Arrival Manager
AMROT	Arithmetical Mean Runway Occupancy Time per aircraft category
ANSP	Air Navigation Service Provider
AN-Conf	Air Navigation Conference
AOBT	Actual Off Block Time
AOC	Assumption of Control
AOM	Airspace Organization and Management
APAC	Asia/Pacific
APCH	Approach
APV	Approach with Vertical Guidance
APW	Area Proximity Warning
ASBU	Aviation System Block Upgrade
ASD	Aircraft Situation Display
ASMGCS	Advanced Surface Movements Guidance Control Systems
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATCO	Air Traffic Controller
ATCONF	Worldwide Air Transport Conference
ATCSCC	Air Traffic Control System Command Center
ATFM	Air Traffic Flow Management
ATFM/CDM	ATFM Collaborative Decision Making
ATIS	Automatic Terminal Information Service
ATM	Air Traffic Management
ATOT	Actual Take Off Time
ATS	Air Traffic Services
ATSA	Air Traffic Situational Awareness
AU	Airspace User
CANSO	Civil Air Navigation Services Organization
CARATS	Collaborative Actions for Renovation of Air Traffic Systems

CBA	Cost Benefit Analysis
CCO	Continuous Climb Operations
CDM	Collaborative Decision-Making
CDO	Continuous Descent Operations
CDR	Conditional Route
CFIT	Controlled Flight into Terrain
CFMU	Central Flow Management Unit
CIBT	Calculated In Block Time
CLAM	Cleared Level Adherence Monitoring
CLDT	Calculated Landing Time
CNS	Communication, Navigation and Surveillance
CO_2	Carbon Dioxide
COM	Communication
CONOPS	Concept of Operations
CNS	Communications, Navigation, Surveillance
COBT	Calculated off Block Time
CPAR	Conflict Prediction and Resolution
CPDLC	Controller Pilot Data-link Communications
CPWG	Cross-Polar Working Group
CSP	Communication Service Provider
CTA	Control Area
CTO	Calculated Time Over
CTOT	Calculated Take Off Time
CTR	Control Zone
DARP	Dynamic Airborne Re-route Planning
DCB	Demand and Capacity Balancing
DCR	Declared Capacity of the Runway set
DFIX	Departure Fix
DGCA	Conference of Directors General of Civil Aviation
DMAN	Departure Manager
DME	Distance Measuring Equipment
ECAC	European Civil Aviation Conference
ELDT	Estimated Landing Time
EOBT	Estimated off Block Time
EST	Coordinate Estimate
ETO	Estimated Time Over
ETOT	Estimated Take Off Time
EU	European Union
EUROCONTROL	The European Organisation for the Safety of Air Navigation
FAA	Federal Aviation Administration
FAS	Final Approach Segment
FCA	Flow Constrained Area
FDP	Flight Data Processor
FDPS	Flight Data Processing System
FIR	Flight Information Region
FIRB	Flight Information Region Boundary
FIXM	Flight Information Exchange Model
FL	Flight Level
FLAS	Flight Level Allocation Scheme
FLOS	Flight Level Orientation Scheme
FMP	Flow Management Position
FMU	Flow Management Unit
FOC	Flight Operation Center
FPL	Flight Plan Message
FRMS	Fatigue Risk Management System
FUA	Flexible Use Airspace
GANIS	Global Air Navigation Industry Symposium

GANP	Global Air Navigation Plan
GASP	Global Aviation Safety Plan
GBAS	Ground-based Augmentation System
GDP	Gross Domestic Product
GDP	Ground Delay Programme
GLS	GNSS Landing System
GNSS	Global Navigation Satellite System
GPI	Global Plan Initiative
GS	Ground Stop
HF	High Frequency
HITL	Human-In-The-Loop
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
INS	Inertial Navigation Systems
IO	International Organizations
LOA	Letter of Agreement
IPACG	Informal Pacific ATC Coordinating Group
ISPACG	Informal South Pacific ATS Coordinating Group
ITP	In-Trail Procedure
KPA	Key Performance Area
LNAV	Lateral Navigation
LVO	Low Visibility Operations
MET	Meteorological
METAR	Meteorological Aerodrome Report
MIDANPIRG	MID Air Navigation Planning and Implementation Regional Group
MINIT	Minutes in Trail
MIT	Miles in Trail
MLAT	Multilateration
MROT	Mean Runway Occupancy Time
MROTL	Arithmetical Mean Runway Occupancy Time during Landing per aircraft
MROTT	Mean Runway Occupancy Time during Take-off per aircraft category
MSAW	Minimum Safe Altitude Warning
MTF	Major Traffic Flow
MTTS	Mean weighted Time between Two consecutive landings, Taking into account Total Separation
NextGen	Next Generation Air Transportation System
NAS	National Airspace System
NavAid	Navigation Aid
NOPS	Network Operation
OP	Operations Plan
OPMET	Operational Meteorological
OLDI	On-Line Data Interchange
PACOTS	Pacific Organized Track System
PARS	Preferred Aerodrome/Airspace and Route Specifications
PASL	Preferred ATM Service Levels
PBN	Performance-based Navigation
PKP	Passenger Kilometres Performed
PLDT	Planned Landing Time
PTOT	Planned Take Off Time
PVT	Passenger Value of Time
RAIM	Receiver Autonomous Integrity Monitoring
RAM	Route Adherence Monitoring
RANP	Regional Air Navigation Plan
RFIX	En-route Fix
ROT	Runway Occupancy Time

ROTL	Runway Occupancy Time during Landing
ROTT	Runway Occupancy Time during Take-off
RPK	Revenue Passenger Kilometres
RNAV	Area Navigation
RNP	Required Navigation Performance
RVSM	Reduced Vertical Separation Minimum
SATVOICE	Satellite Voice Communications
SAR	Search and Rescue
SBAS	Space Based Augmentation System
SEET	Scheduled Estimated En-route Time
SESAR	Single European Sky ATM Research
SG	Steering Group
SHEL	Software, Hardware, Environment and Liveware
SIBT	Scheduled In Block Time
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Information
SLDT	Scheduled Landing Time
SME	Subject Matter Expert
SOBT	Scheduled off Block Time
SPECI	Special Weather Report
STAR	Standard Terminal Arrival Route or Standard Instrument Arrival (Doc 4444)
STOT	Scheduled Take Off Time
STCA	Short Term Conflict Alert
STS	Special Handling Status
SUA	Special Use Airspace
SUB	Slot Swapping
SUR	Surveillance
SWIM	System-Wide Information Management
TAF	Terminal Area Forecast
TAWS	Terrain Awareness Warning Systems
TBO	Trajectory Based Operations
TCAC	Tropical Cyclone Advisory Centre
TCAS	Traffic Collision Avoidance System
TLDT	Target Landing Time
TA	Traffic Management
TOBT	Target off – Block Time
TOC	Transfer of Control
TOS	Traffic Orientation Scheme
TSAT	Target Start Up Approval Time
TTOT	Target Take off Time
UAS	Unmanned Aircraft Systems
UAT	Universal Access Transceiver
UPR	User Preferred Routes
VAAC	Volcanic Ash Advisory Centre
VHF	Very High Frequency
VMC	Visual Meteorological Systems
VNAV	Vertical Navigation
VMC	Visual Meteorological Conditions
VOLMET	Volume Meteorological
VOR	Very High Frequency Omni-directional Radio Range
VSAT	Very Small Aperture
WAFC	World Area Forecast Centre
WATS	World Air Transport Statistics
WSG	World Slot Guidelines

2- ATFM Terminology and Definition

ACC/sector group capacity: The theoretical maximum number of flights that may enter an ACC or sector group per hour, over a period of time (e.g. 3 hours), without causing excessive workload in any of the sectors. This capacity indicator is used for capacity planning and monitoring purposes and has no operational value. The indicator is calculated mathematically using a validated methodology.

Actual In Block Time (AIBT): The time that an aircraft arrives in-blocks (Equivalent to Airline/Handler ATA –Actual Time of Arrival, ACARS = IN).

Actual Landing Time (ALDT): Actual time an aircraft lands on a runway (Equivalent to ATC ATA – Actual Time of Arrival = landing, ACARS=ON).

Actual Off Block Time (AOBT): The time the aircraft pushes back / vacates parking position (Equivalent to Airline / Handlers ATD – Actual Time of Departure & ACARS=OUT).

Actual Take Off Time (ATOT): The time that an aircraft takes off from the runway (Equivalent to ATC ATD–Actual Time of Departure, ACARS = OFF).

Airport Acceptance Rate (AAR): Arrival capacity of an airport normally expressed in movements per hour.

Airport Departure Rate (ADR): Departure Capacity of an airport normally expressed in movements per hour.

Aircraft Situation Display (ASD): ATC Aircraft/Traffic Situation Display.

Arrival Fix (AFIX): A waypoint during the arrival phase of a flight. In the context of ATFM it could a waypoint where an ATFM Measure may be applied.

ATFM Measure: ATFM Measure which will balance demand against capacity or assist in the safe expeditious flow of traffic.

Calculated In Block Time (CIBT): An in block time calculated and issued by ATFM unit, as a result of tactical slot allocation at which a flight is expected to be at its first parking position.

Calculated Landing Time (CLDT): A landing time calculated and issued by ATFM unit, as a result of tactical slot allocation at which a flight is expected to land on a runway.

Calculated Off Block Time (COBT): A time calculated and issued by ATFM Unit, as a result of tactical slot allocation, at which a flight is expected to pushes back / vacates parking position so as to meet a CTOT taking into account start and taxi time.

Calculated Take off Time (CTOT): A time calculated and issued by ATFM Unit, as a result of tactical slot allocation, at which a flight is expected become airborne.

Calculated Time Over (CTO): Time calculated and issued by ATFM Unit, as a result of tactical slot allocation, at which flight is expected to be over a fix, waypoint or particular location typically where air traffic congestion is expected (referred to in FIXM 2.0 as "Airspace Entry Time - Controlled").

Capacity baseline: The value of the capacity indicator (see ACC/sector group capacity above) for the ACC and defined sector groups.

Capacity profile: The evolution of required capacity over the 5-year planning cycle, considering certain assumptions, for a specified volume of airspace (ACC or defined sector group), in terms of absolute demand (flights per hour) and annual percentage increases. These values are published annually and are used as a basis for local capacity planning by ANSPs.

Collaborative Decision-Making (CDM): Process which allows decisions to be taken by amalgamating all pertinent and accurate sources of information, ensuring that the data best reflects the situation as known, and ensuring that all concerned stakeholders are given the opportunity to influence the decision. This in turn enables decisions to best meet the operational requirements of all concerned.

Conditional Route (CDR): ATS route that is available for flight planning and use under specific conditions.

Declared sector capacity or monitoring value: The value the ANSP declares to the CFMU as the maximum number of flights per hour that can enter a sector before the application of an ATFM regulation becomes necessary. Several values may exist — depending on the ATC environment at the time (airspace, equipment, traffic pattern, staffing, weather, etc.). The value can change according to the situation at the ACC.

Declared traffic volume capacity: The capacity for a given period of time for a given traffic volume, as made known by the ANSP to the ATFM Function, so that it can provide the ATFM service. As with sector capacity, the value can change depending on the ATC environment at the ACC at the time.

Departure Fix (DFIX): The first published fix/waypoint used after departure of a flight.

Departure Manager (DMAN): A planning system to improve the departure flows at an airport by calculating the Target Take-Off Time (TTOT) and Target Start up Approval Time (TSAT) for each flight, taking multiple constraints and preferences into account.

Elementary sector: Primary component of the airspace structure, one or more of which may be combined to form a sector. In some cases the elementary sector can be the same as the operational sector; in other cases, the elementary sector is never open operationally without being combined with one or more other elementary sectors.

En-route Fix (RFIX): A waypoint during the en-route phase of a flight. In the context of ATFM it could a waypoint where an ATFM Measure may be applied.

Estimated Landing Time (ELDT): The estimated time that an aircraft will touch-down on the runway (equivalent to ETA).

Estimated Off Block Time (EOBT): The estimated time that an aircraft will start movement associated with departure.

Estimated Take Off Time (ETOT): The Estimated take off time taking into account EOBT plus Estimated Taxi-Out Time.

Estimated Time Over (ETO): Estimated time at which an aircraft would be over a fix, waypoint or particular location typically where air traffic congestion is expected.

Flow Constrained Area (FCA): An sector of airspace where normal flows of traffic are constrained, which could be caused by weather, military exercise etc.

Flow Management Position (FMP): A position in any ATCC that monitors traffic flows and implements or requests ATFM measures to be implemented".

Ground Delay Program (GDP): ATFM process where aircraft are held on the ground in order to manage capacity and demand in a specific volume of airspace or at a specific airport. In the process departure times are assigned and correspond to available entry slots into the constrained airspace or arrival slots into the constrained airport.

Ground Stop (GS): A tactical ATFM measure where some selected aircraft remain on the ground.

Miles in Trail (MIT): A tactical ATFM measure expressed as the number of miles required between aircraft (in addition to the minimum longitudinal requirements) to meet a specific criterion which may be separation, airport, fix, altitude, sector or route specific. MIT is used to organize traffic into manageable flows as well as to provide space to accommodate additional traffic (merging or departing) in the existing traffic flows. It will never be less than the separation minima.

Minutes in Trail (MINIT): A tactical ATFM measure expressed as the number of minutes required between successive aircraft. It is normally used in airspace without air traffic surveillance or when transitioning from surveillance to non-surveillance airspace, or even when the spacing interval is such that it would be difficult for a sector controller to measure it in terms of miles.

Network effect: The network effect is the phenomenon where regulations placed on parts of the network affect the demand structure observed in other parts of the network. Network effects range from simple interactions of cause and effect to more complex interactions between groups of sectors, where causes are repeatedly re-triggered by effects, involving several oscillations before a stable equilibrium is reached. Affected sectors could be adjacent, in the same region, or distant sectors located on the far side of the European Civil Aviation Conference (ECAC) zone.

Planned Landing Time (PLDT): The expected landing time of a flight derived from the flight plan.

Planned Take Off Time (PTOT): Time aircraft is expected to take off derived from the flight plan.

Scheduled Estimated En-route Time (SEET): The estimated elapsed time of a flight derived from the aircraft operators schedule.

Scheduled In Block Time (SIBT): The Time that an aircraft is scheduled to arrive at its first parking position.

Scheduled Landing Time (SLDT): Scheduled time aircraft is expected to land on a runway, typically based on Scheduled In-Block Time (SIBT) and a standard taxi-in time.

Scheduled off Block Time (SOBT): The time that an aircraft is scheduled to depart from the parking position.

Scheduled Take Off Time (STOT): The estimated take off time derived from an aircraft operators schedule, typically based on a standard taxi-out time.

Sector: Primary operational component of the airspace structure that can be considered as an elementary capacity reference of the ATM system. A sector is made up of one or more elementary sectors.

Sector capacity: The maximum number of flights that may enter a sector per hour averaged over a sustainable period of time (e.g. 3 hours), to ensure a safe, orderly and efficient traffic flow. Some ANSPs manage sector capacities tactically over a shorter period of time (e.g. 15 minutes). However, for global assessment purposes, the hourly figure is used as a standard.

Sector group: Group of sectors that strongly interact with each other through close and complex coordination, satisfying the agreed concept of operations.

Slot Swapping (SUB): The ability to swap departure slots gives AUs the possibility to change the order of flight departures that should fly in a constrained area.

Target Landing Time (TLDT)*:* Targeted Time from the Arrival Management process at the Threshold, taking runway sequence and constraints into account; Progressively refined planning time used to coordinate between arrival and departure management processes.

Target Off - Block Time (TOBT): The time that an aircraft Operator or Ground handler estimates that an aircraft will be ready to startup/pushback immediately upon reception of clearance from the tower.

Target Start Up Approval Time (TSAT): The time provided by ATC taking into account TOBT, CTOT and/or the traffic situation that an aircraft can expect start up/push back approval.

Target Take Off Time (TTOT): The Target Take off Time taking into account the TOBT/TSAT plus Estimated Taxi-Out Time.

Traffic volume: Airspace component based on traffic flow that serves as a reference to design the ATC sectors.

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PART I – MID ATFM FRAMEWORK

PART I

MID ATFM FRAMEWORK

1. Scope of the Framework

Regional Air Traffic Flow Management

1.1 This MID Regional Air Traffic Flow Management (ATFM) framework was developed based on ICAO Doc 9971, ICAO MID Air Traffic Flow Management – Concept of Operation (MID Doc 014 V1.0) and the Asia/Pacific Regional ATFM framework.

1.2 In the respect of traffic operation in the MID Region, the airspace and main airports have the following characteristics:

a) MID airspace influenced by verity of overflight traffic mainly at the interface between Asia APAC and EUR/NAT;
b) Extensive operation of major/hub airports in the region;
c) Globally operation of MID famous airlines (those airlines have been ranked among the best top ten);
d) During Haj season, additional traffic operation/movement will be imposed to MID airspace and associated airports;
e) Except during COVID-19 pandemic crisis, the annual traffic growth in the region is more than 5%;
f) However, most of the concerned states have already implemented ICAO SARPs in line with global improvement and invested on new technologies/equipment to build and optimize the capacity at the airports and airspace to the maximum extent possible, some airspace and airports are already saturated;
g) Interest and ability of the MID states for being host of major global events;
h) Tourism attraction destinations in the region; and
i) Potential of contingency events and crises in the region and its interfaces.

1.3 The ICAO MID Air Navigation Strategy (MID Doc 002) provides a blueprint for coordinated Regional development, including capability improvements described in the ICAO Doc 9750 (Global Air Navigation Plan (GANP) - Sixth Edition) regarding ICAO Aviation System Block Upgrades (ASBU) roadmap. Air Traffic Flow Management (ATFM) taking a network view, is a key module in ASBU Blocks zero, one, two and three. B0/1-NOPS element – Initial integration of collaborative airspace management with air traffic flow management - has been identified by MIDANPIRG/18 as one of thirty-five priority 1 for the MID Region.

1.4 The need for MID regional ATFM framework focusing on Multi-Nodal solution. A key to the concept is that each State/ANSP would be responsible for implementing ATFM programs to airports and airspace within their area of responsibility according to the concept illustrated in this document. Information sharing between the ATFM systems would allow the users from any of the systems to have access to network-wide information multi-State implementation, was solution was endorsed by MAPANPIRG/18 through the following Conclusion:

MIDANPIRG CONCLUSION 18/28: MID REGION ATFM CONOPS

That, the MID Region ATFM CONOPS V1.0 is endorsed and be published as MID Doc 014 on the ICAO MID website.

1.5 A core concept of the Framework is the distributed multi-nodal ATFM network, envisaged as interconnected States and/or sub-Regional groups operating in an ATFM network without the need for any central, physical facility providing the network management function. In this regard the meeting also endorsed the ATM Operational Data Exchange process, which was developed by the ATFM TF and the secretariat based on ICAO ATM/CDM data exchange process. Accordingly, the meeting agreed to the following MIDANPIRG Conclusion:

MIDANPIRG CONCLUSION 18/29: ATM OPERATIONAL DATA EXCHANGE

That, in order to ensure better coordination between ANSPs and improve ATS planning:

a) The MID ATM Operational Data Exchange process at Appendix 5.2L, is endorsed.

b) Airspace users are invited to share with the ICAO MID Office the data related to their "Intention To Operate (ITO)" on monthly basis, for posting on the ICAO MID Office Secure Portal (Group "RO-MIDITO");

c) States be urged to nominate Focal Points/Coordinators for ATM data exchange; in order to be granted access to the ITO data available on ICAO MID secure portal;

d) ICAO MID Office to organize periodic coordination meetings for ANSPs to exchange ATM operational data; and

e) States ensure that the ITO and ATM Operational data are used solely for airspace management and ATC planning purposes during the recovery phase, and should not be shared outside the ATM community as it contains operational and financial sensitive data.

Note 1: The group was established in the ICAO MID Secure Portal and Group name was renamed to be OPSDataEX.

Note 2: The Framework will, in its future versions, be expanded and adjusted where necessary as the concept matures and experience is gained from operational implementation of cross-border, network-based ATFM and its supporting technology.

1.6 ICAO Doc 9971 states that in its initial application, ATFM need not involve complicated processes, procedures or tools. The goal is to collaborate with system stakeholders and to communicate operational information to airspace users, ANSPs, and to other stakeholders in a timely manner. Version 1.0 of the Framework includes near to medium term performance objectives to prepare and guide States in the implementation of collaborative, cross-border ATFM, providing for regionally harmonized ATFM concepts, communications and practices.

Framework Structure

1.7 The Framework, developed by the ICAO MID ATFM TF/6, will be reviewed by ATM SG/7 and will be presented to MIDANPIRG/19 for endorsement, as a part of regional ANP documents relevant to the ICAO MID Region.

1.8 Global vision and strategy perspectives are provided by the Global ATM Operational Concept (Doc 9854), Global Air Navigation Plan (GANP, Doc 9750 6th edition), and Global Aviation Safety Plan (GASP, Doc 10004). The GANP includes the Aviation System Block Upgrade (ASBU) framework, its Modules and its associated technology Roadmaps.

1.9 The Framework includes analysis of the current situation, a performance improvement plan, and considerations for research and future development.

1.10 The performance objectives of the Framework are expected to be implemented in Level aligned, with the ICAO MID Air Navigation Strategy (MID Doc 002). The MID Region ATFM framework is expected to be implemented in the following Levels:

- Level I, expected implementation by 31 December 2022 (aligned with MID Doc 002, priority 1);

- Level II, expected implementation by 31 December 2023 (aligned with MID Doc 002, priority 2 and further decision/update in MIDANPIRG/19); and

- Level III, expected implementation by 31 December 2025. (aligned with MID Doc 002, the rest of ASBU related Threads/Elements and further update in coming MIDANPIRG meeting)

1.11 None of the above Levels or any element of the Framework is binding on any State, and they should be considered as a planning framework. It is important to note that, the Framework's Level commencement dates are planning targets. They should not be treated as a 'hard' date such as the example of Reduced Vertical Separation Minimum (RVSM) implementation. In that case there was a potential major regional problem if all States did not implement at the same time by the specific agreed date, which is clearly not the case for the start of the Framework Levels.

1.12 In that regard, although it would be ideal if all States achieved capability on day one of Level I, this is probably not realistic. States should, however, consider the impact on stakeholders and on the needed improvements in cross-border ATFM and the ATM system overall that would result from not achieving target implementation dates. The Framework dates, were chosen as being an achievable target for the majority of States. However the dates were not designed to accommodate the least capable State, otherwise the region as a whole would fall behind the necessary urgent ATM improvements required by MIDANPIRG (regional level) and GANP (global level).

<u>Document Review</u>

1.13 The Framework is intended, as a minimum, to be reviewed by ATM SG and annual based thereafter. More frequent review and amendment will be conducted as recommended by ATFM TF that will be agreed by ATM SG and endorsed by MIDANPIRG.

2. Development and Objectives of the Framework

Framework Development

2.1 The MID Region ATFM/TF was formed by the MID ATM SG and established by MIDANPIRG to inter alia, develop a common Regional ATFM CONOPS and framework which addresses ATFM implementation and ATFM operational issues in the MID Region.

2.2 The Framework was developed by ICAO MID ATM ROs with contribution of ATFM TF Chairman, reviewed by MID State during ATFM TF/6 and ATM SG/7. The Framework was endorsed by the MIDANPIRG/19, Jeddah, Saudi Arabia, February 2022.

2.3 The Framework draws on relevant experience gained in MID Region States and other Regions particularly Asia/Pacific. Key concepts used or adapted in the Framework include:

- A distributed multi-nodal cross-border ATFM network rather than a regionally centralized facility;

- The MID ATM Operational Data Exchange process endorsed as a practical model for ATFM information exchange and coordination;

- Airspace users are invited to share with the ICAO MID Office the data related to their "Intention To Operate (ITO)" on monthly basis; for solely airspace management and ATS units planning purposes by posting them on the ICAO MID Office Secure Portal (Group "OPSDataEX");

- States nominated Focal Points/Coordinators for ATM data exchange; in order to be granted access to the ITO data available on ICAO MID secure portal; and

- ICAO MID Office to organize periodic coordination meetings for ANSPs to exchange ATM operational data. When it becomes operationally required.

2.4 The performance objectives of the Framework are, wherever practicable, aligned with the ATFM-related objectives and implementation timelines of the ICAO MID Air Navigation Strategy (MID Doc 002).

2.5 Further development of the Framework beyond this version will be guided by the concepts discussed in its Research and Future Development section, and by the experience gained in operational implementation and the maturing distributed multi-nodal ATFM network concept. ATFM and Collaborative Decision-Making.

ATFM Framework Objective

2.6 Having considered relevant documents such as the Global Air Navigation Plan (Doc 9750 6th edition), the ICAO MID Air Navigation Strategy (MID Doc 002) and the Manual on Collaborative Air Traffic Flow Management (Doc 9971), the objective of the Framework is to provide a regionally agreed framework for the harmonized implementation of networked, interoperable, multi-FIR, multi-State, cross-boundary collaborative ATFM capability.

2.7 The Framework provides information, guidance and performance objectives including:

- ATFM principles;
- ATFM-related Aviation System Block Upgrades (ASBU), and relevant performance objectives from the ICAO MID Air Navigation Strategy;
- Collaborative decision-making (CDM);
- ATFM phases;

- Airspace and airport capacity improvement, planning, assessment and declaration;
- ATFM daily plan;
- ATFM terminology, communications and information distribution;
- Meteorological information for ATFM;
- Distributed multi-nodal ATFM network concept;
- Training and competencies for ATFM personnel;
- Analysis of current ATFM capability in the Region;
- A performance improvement plan; and
- Considerations for research and future development.

<u>The Need for a Regional Framework for Collaborative ATFM</u>

2.8 The MID Region is well known for its attractive business, religious and pleasure destination. This area geographically located at interface between Asia APAC and EUR/NAT airspaces. The number of air traffic operation and airport movements are extremely high. The annual air traffic growth in the region, except during COVID-19, is still increasingly to more than 5%. Those outstanding factors, encouraged MID States to invest in aviation by developing state of the art airports, establishment of famous airlines, enhance level of ANS or combination of those elements.

2.9 While recognizing that the first response to increased demand should always be an increase in capacity, the growing demand/capacity imbalance in the Region has resulted in increasing congestion, delays, costs and potential safety risks.

2.10 The need for a regional, network-based response to the challenges of increasing demand was recommended in the ICAO ATFM Seminar (Dubai, UAE, from 13 to 15 December 2016). Consequently, MIDANPIRG/16, through Decision 16/16 endorsed to establish ATFM Task Force as follows:

MIDANPIRG DECISION 16/16: ATFM TASK FORCE

That,

a) *an ATFM Task Force be established to develop an ATFM Concept of Operations for the MID Region;*

b) *the ATM SG/3 meeting develop the terms of reference of the ATFM Task Force; and*

c) *States support the ATFM Task Force through:*

d) *assignment of ATFM Focal Point to contribute to the work of the Task Force; and*

e) *provision of required data in timely manner, and in particular to the survey that will be carried out related to the airspace and sectors capacity, hot-spots, ATFM measures/system, etc.*

<u>Distributed Multi-Nodal ATFM Network Concept</u>

2.11 The ATFM TF/2 proposed the Multi-Nodal Concept for the MID Region as a first Level, which would be evolved to a centralized ATFM system in the future. Accordingly, MIDANPIRG/17 agreed to the following Conclusion:

MIDANPIRG CONCLUSION 17/22: MULTI-NODAL ATFM Solution for the MID Region

That,

a) *the Multi-Nodal Concept be implemented in the MID Region, as a first phase, which would be evolved to a centralized ATFM system in the future; and.*

b) *the ATFM Task Force develop the ATFM Concept of Operations for MID Region, accordingly, including the minimum flight data that should be exchanged by ATFM Units.*

2.12 Also the MIDANPIRG/17 meeting highlighted that Asia Pacific Multi-Nodal documents including CONOPS, Regional Framework and Common Operating Procedures, would be used as basis for the development of the MID Region ATFM Documentation. In this regard, the meeting agreed to the following MIDANPIRG/17 Conclusion:

MIDANPIRG CONCLUSION 17/23: Action Plan for the Implementation of ATFM in the MID Region

That,

a) *the Action Plan for the implementation of ATFM in the MID Region at Appendix 6.2J is endorsed; and*

b) *States and Stakeholders to support the work of the ATFM Task Force and implement the actions relevant to them.*

2.13 The ATFM TF/4 proposed the draft of MID ATFM CONOPS version 1.1 to the MIDANPIRG/18 meeting. The draft was reviewed and endorsed by MIDANPIRG/18 meeting through the following Conclusion:

MIDANPIRG Conclusion 18/28: MID Region ATFM CONOPS

That,

the MID Region ATFM CONOPS V1.0 is endorsed and be published as MID Doc 014 on the ICAO MID website.

<u>ATM Operational Data Exchange process is the Key</u>

2.14 Accordingly, the MIDANPIRG/18 meeting reviewed and endorsed the ATM Operational Data Exchange process its Appendix 5.2L, which was developed by the ATFM TF/4 and the secretariat based on ICAO ATM/CDM data exchange process. In this respect, the meeting agreed to the following MIDANPIRG Conclusion:

MIDANPIRG Conclusion 18/29: ATM Operational Data Exchange

That, in order to ensure better coordination between ANSPs and improve ATS planning:

a) *The MID ATM Operational Data Exchange process at Appendix 5.2L, is endorsed.*

b) *Airspace users are invited to share with the ICAO MID Office the data related to their "Intention To Operate (ITO)" on monthly basis, for posting on the ICAO MID Office Secure Portal (Group "RO-MIDITO");*

c) *States be urged to nominate Focal Points/Coordinators for ATM data exchange; in order to be granted access to the ITO data available on ICAO MID secure portal;*

d) *ICAO MID Office to organize periodic coordination meetings for ANSPs to exchange ATM operational data; and*

e) *States ensure that the ITO and ATM Operational data are used solely for* *airspace management and ATC planning purposes during the recovery phase, and should not be shared outside the ATM community as it contains operational and financial sensitive data.*

Note: The group was established in the ICAO MID Secure Portal and Group name was renamed to "OPSDataEX".

3. Background Information

ATFM Principles

3.1 The major areas of Collaborative ATFM principles are mainly aligned with those of the ICAO MID Air Navigation Strategy (MID Doc 002), MID ATFM CONOPS endorsed by MIDANPIRG 18/28, ATM Operational Data Exchange process agreed by MIDANPIRG 18/29 and MID ATFM Action Plan endorsed by MIDANPIRG 17/23 included at ***Appendix A.*** The action plan is continuously reviewed and updated by the ATFM TF.

ATFM-Related Aviation System Block Upgrades (ASBU)

Note: in this section, the valid and update reference for each element applicability area, performance indicators/supporting metrics and timeline is MID Air Navigation Strategy (MID Doc 002).

3.2 The ICAO ASBU threads and elements, detailed in Doc 9750 – Global Air Navigation Plan (GANP) 6th edition, describes a way to apply the concepts defined in Doc 9854 – Global Air Traffic Management Operational Concept (GATMOC), with the goal of implementing regional and global performance improvements. They are intended to provide a set of aviation system solutions or upgrades that exploit current aircraft equipage and capability, and to establish a transition plan enabling global interoperability. The ASBUs comprise a suite of modules organized into flexible and scalable building blocks where each module represents a specific, well-bounded improvement. The modules may be introduced and implemented in a State or region depending on the need and level of readiness. It is recognized that all the modules are not required in all airspaces.

3.3 Based on APAC experience to address the prerequisites of ATFM implementation from ASBU point of view (modules, threads & elements) and taking into account 35 elements of Blocks 0 and 1 that were considered as priority one in the MID Air Navigation Strategy (MID Doc 002) endorsed by MIDANPIRG/18, the following threads and elements have been identified as the most related factors to ATFM implementation Level I in the MID Region:

- NOPS B0/1 (Initial integration of collaborative airspace management with air traffic flow management);
- FICE B0/1 (Automated basic inter facility data exchange (AIDC/OLDI));
- FRTO B0/2 (Airspace planning and Flexible Use of Airspace (FUA)) & B0/4 (Basic conflict detection and conformance monitoring); and
- ASUR B0/1 (Automatic Dependent Surveillance – Broadcast (ADS-B)), B0/2 (Multilateration cooperative surveillance systems (MLAT)) & B0/3 (Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS).

3.4 In line with Para 4.3, the following most related elements also considered as priority two for implementation of ATFM Level II in the MID Region:

- NOPS B0/2, B0/3, B0/4, B0/5, B1/1, B1/2, B1/3, B1/4, B1/5, B1/6, B1/7, B1/8, B1/9 & B1/10;
- FRTO B0/1, B0/3, B1/1, B1/2, B1/3, B1/4, B1/5, B1/6 & B1/7; and
- ASUR B1/1.

3.5 In the same vein and taking into account the rest of selected 35 elements (Blocks 0 and 1) that were considered as priority one in MID Air Navigation Strategy (MID Doc 002) endorsed by MIDANPIRG/18, the following threads and elements have been identified as the complementary factors to ATFM implementation Level I in the MID Region.

- ACDM B0/1 (Airport CDM Information Sharing (ACIS)), B0/2 (Integration with ATM Network function) & B1/1 (Airport Operations Plan (AOP));

- AMET B0/1 (Meteorological observations products), B0/2 (Meteorological forecast and warning products), B0/3 (Climatological and historical meteorological products) & B0/4 (Dissemination of meteorological products);
- APTA B0/4 (CDO (Basic)) & B0/5 (CCO (Basic));
- RSEQ B0/1 (Arrival Management); and
- SURF B0/1 (Basic ATCO tools to manage traffic during ground operations), B0/2 (Comprehensive situational awareness of surface operations) & B0/3 (Initial ATCO alerting service for surface operations).

3.6 In line with Para 4.7, the following complementary elements also considered as priority two for implementation of ATFM Level II in the MID Region.

- ACDM B1/2;
- AMET B1/1, B1/2, B1/3 & B1/4;
- APTA B1/4 & B1/5;
- RSEQ B0/2, B0/3 & B1/1; and
- SURF B1/1, B1/2, B1/3, B1/4 & B1/5.

3.7 Determination of related threads and elements for implementation of ATFM Level III is postponed to after completion of study/review of the implementation progress/lesson learned in Level I and take into consideration the outcome of new research and development by ATFM TF to make required proposal for further decision/conclusion by related MIDANPIRG meeting.

<u>Collaborative Decision Making - ATM Operational Data Exchange process</u>

3.8 ICAO Doc 9971 defines Collaborative Decision Making:

A process focused on how to decide on a course of action articulated between two or more community members. Through this process, ATM community members share information related to that decision and agree on and apply the decision-making approach and principles. The overall objective of the process is to improve the performance of the ATM system as a whole while balancing the needs of individual ATM community members.

3.9 The planning and implementation of cross-boundary, networked ATFM requires new levels of collaborative decision-making among multi-national stakeholders. While current ATFM CDM processes and ATFM systems are oriented towards local or national demand and capacity balancing, the maturing of ATFM systems and expansion across national boundaries will lead to a CDM environment of multilateral decision-making with complementary individual goals.

3.10 Cross-border ATFM should have the following characteristics:

- an inclusive process – Participation by States and other Stakeholders is the key;
- a transparent process – Simple business rules to ensure compliance and build trust will be necessary;
- allows Sharing of information between all partners through a common network to improved efficiency and operational decision making; and
- achieve common situational awareness for all partners, taking into account the data sharing capability of stakeholders.

3.11 Cross-border ATFM/CDM should provide opportunities for the efficient exchange of operational and strategic information for all stakeholders, ensuring strategic cooperation towards achieving the objectives of seamless ATM and optimization of traffic flows across the region.

3.12 CDM partners and stakeholders should include:

- States, establishing regulations and overseeing safety and compliance;

- ANSPs, implementing ATFM capability;
- International Organizations such as ACI, CANSO, IATA and IFATCA;
- International ATFM units (to share tactical flight data) i.e. CFMU, BOBCAT;
- Airport operators;
- CDM-participating airlines.

3.13 Each State will develop ATFM capability according to its needs and requirements, and the overarching goal of seamless ATM across the MID Region.

3.14 The Regional concept for cross border ATFM is based on ICAO ATM/CDM data exchange process. Under this concept each State and Stakeholder nominated Focal Point/Coordinator, will be tasked to participate collaboratively in national, cross-border and regional coordination meeting.

3.15 Based on all the above and take into consideration of ICAO ATM/CDM data exchange process, The MIDANPIRG/18 meeting in conclusion 18/29 endorsed the ATM Operational Data Exchange process. This process is a key element for implementation of ATFM collaboration in the MID region at Level I. the process is explained at this document, ***Appendix B***.

3.16 In this vein, and for harmonization in ATFM agreement between States, ICAO in Doc 9971 at ***Appendix G***, published a Template for Letter of Agreement (LOA) between ANSPs on flow management. In this regard and with consideration of MIDANPIRG/18 conclusion 18/29, this Template was aligned with MID Region ATM Operational Data Exchange process at ***Appendix H***.

ATFM Phases

3.17 ICAO Doc 9971 describes three phases of ATFM execution; strategic, pre-tactical and tactical, illustrated in Figure 1.

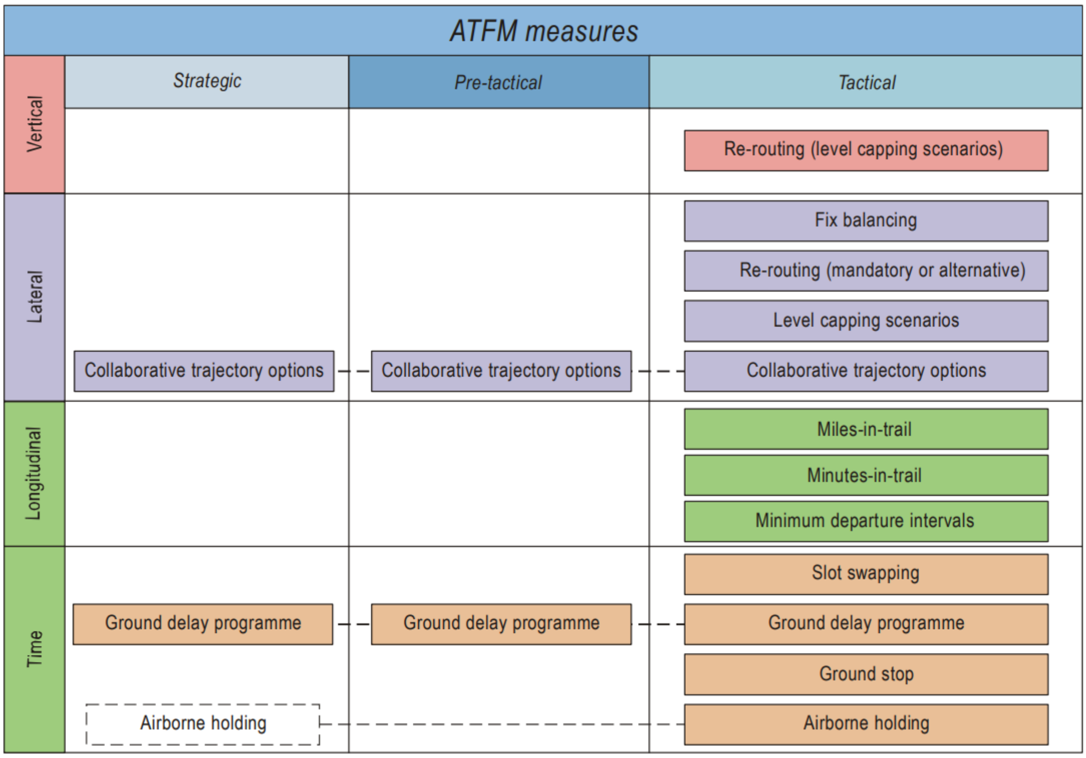


Figure 1: ATFM Operational Management and Phases

3.18 The Strategic ATFM phase encompasses measures taken more than one day prior to the day of operation. Much of this work is accomplished two months or more in advance. Strategic ATFM includes the planning and execution of long-term demand and capacity balancing including arrival slot allocation at Coordinated Airports.

3.19 The Pre-Tactical ATFM phase encompasses measures taken up to one day prior to operations, with the main objective of optimizing capacity through an effective, dynamic organization of resources. Effective Pre-Tactical ATFM is normally dependent on collaborative decision-making (CDM) processes established between all stakeholders. The necessary inter-State ATFM network capability in the MID Region is not established, but based on MIDANPIRG/18 conclusion 18/29, states agreed to develop the ATM Operational Data Exchange process for implementation of MID ATFM level 1.

3.20 Tactical ATFM measures are taken on the day of operation, managing traffic flows and capacities in real time. These are critical to the real-time operational response to demand/capacity imbalance, and the improvement and maintenance of safety in the management of operational situations where traffic demand exceeds capacity.

3.21 The timely application of measures in all three ATFM phases requires a fundamental understanding of airport and airspace capacity, and the continuous assessment of capacity and the factors that impact upon it.

Airspace and Airport Capacity Improvement

3.22 Increased capacity is the primary and central method for managing increasing demand. Capacity increases may be achieved by improvements in infrastructure, airspace and ATS route design, procedures and stakeholder behaviours.

3.23 Airspace capacity improvements may be achieved by:

- Improved ATS route design including segregation of inbound, outbound (SIDS and STARs) and overfly (transit) traffic flows and, where supported by a business case, mandating of PBN specifications for ATS routes;
- Civil-military cooperation, including increased use of FUA to replace SUA;
- Improved ATC sectorization to more evenly apportion workload, including the capability for dynamic sector configuration;
- ATM automation system enhancements including automated coordination and hand-off procedure between systems (AIDC/OLDI) and sectors, and transition from paper-based flight progress-strips to automated, integrated electronic displays and flight plan interfaces;
- Implementation or extension of ATS surveillance services, and surveillance based separations specified in ICAO Doc 4444 (PANS-ATM); and
- Optimization Longitudinal (in-trail) and Lateral Separation Minima.

3.24 Airport capacity improvements may be achieved by:

- Improved airport design including additional runways, taxiways and appropriately positioned rapid-exit taxiways;
- Harmonized AMAN, DMAN and A-CDM systems;
- Analysis and improvement of runway occupancy times through enhancement of procedures and associated pilot practices; and
- Implementation of precision approaches to all runways.

3.25 The following ICAO MID documents aimed to improve airspace and airport capacity in the MID Region:

- MID Air Navigation Strategy (MID Doc 002);
- MID Region ATM Contingency Plan (MID Doc 003);
- MID High Level Airspace Concept (MID Doc 004);
- MID Region AIDC/OLDI Implementation Guidance (MID Doc 006);
- MID Region PBN Implementation Plan (MID Doc 007);
- Guidance on GNSS Implementation in the MID Region (MID Doc 011);
- MID Region Surveillance Plan (MID Doc 013); and
- MID Air Traffic Flow Management - Concept of Operations (MID Doc 014).

3.26 The demand/capacity analysis identifies a number of factors that are extremely important for the efficient planning of the ATM system so as to ensure an optimum balance that will benefit the ATFM. In this regard at ***Attachment A***, ICAO SAM regional project report in 2009 provides some guidelines for ATM planners to improve system capacity.

Capacity Planning and Declaration

3.27 The Collaborative Decision Making (CDM) process, a key enabler of ATFM, allows all of its subscribing members, called CDM stakeholders, to participate in decisions that affect them after all relevant information has been made available to them. This applies to all types of decisions in the strategic, pre-tactical, and tactical phases.

Note 1: Caution must be taken the only outcome of the following methodologies is not enough for calculation of declared capacity. On other hand, the calculated value will give us maximum capacity and states need to take into account the outcome of daily/periodic MID ATM Operational Data Exchange meetings (National, cross border and regional levels) as complementary resource to determine precise Declared Capacity.

Note 2: Many elements have positive or negative impact on declared capacity. To avoid elimination of such critical factors, MIDANPIRG/18 on conclusion 18/29 endorsed the MID ATM Operational Data Exchange process (MIDANPIRG 18, Appendix 5.2L) and invited States, ANSPs and AUs to share useful operational data/information such as NOTAM, weather, Intention To Operate (ITO) with ICAO MID through secure portal, Group "OPSDataEX". Meanwhile this conclusion urged States to nominate Focal Points/Coordinators for ATM data exchange; in order to be granted access shared data/information and participate in ICAO MID periodic coordination meetings.

3.28 Annex 11 to the Convention on Civil Aviation (Air Traffic Services) defines declared capacity as a measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specified portion of airspace in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the airspace.

3.29 The capacity of an ATS system depends on many factors, including traffic density and complexity, the ATS route structure, the navigation accuracy and capability of the aircraft using the airspace, weather-related factors, controller equipment and workload. Every effort should be made to provide sufficient capacity to cater to both normal and peak traffic levels; however, in implementing any measures to increase capacity, the responsible ATS authority shall ensure safety levels are not jeopardized.

3.30 In case of particular events that have a negative impact on the declared capacity of an airspace or aerodrome, the capacity of the airspace or aerodrome concerned shall be reduced accordingly for the required time period. Whenever possible, the capacity pertaining to such events should be predetermined.

3.31 The primary areas of capacity assessment and declaration for ATFM are Airport

Acceptance Rate (AAR), Airport Departure Rate (ADR), and airspace sector capacity. AAR and ADR are usually expressed in terms of landings or departures per hour. Sector capacity may be expressed in terms of occupancy count and/or entry count.

3.32 The followings are the abstract and reference of global experiences for determination of capacity in different domain.

a) ICAO ATS planning manual, Doc 9426, specifically explained two techniques, implemented by the United Kingdom (DORA TASK) and Germany (MBB).

b) ICAO SAM regional office, had project in 2009 regarding implementation of ATFM in its own region. The outcome of the project is very valuable and comprehensive document have been published under their responsibility to introduce Model used in Brazil, Colombia and FAA for Trinidad y Tobago (ICAO NACC-20th E/CAR DCA-WP/21).

c) ICAO Manual on collaborative ATFM, Doc 9971, Part II, introduce two simplified methods related to determination of Airport Acceptance Rate (AAR) and Sector capacity.

d) Other models based on Simulation also developed by many States/Companies such as SIMMOD (FAA), RAMS (EUROCONTROL) and TAAM (Australia), these models do not measure capacity directly and more focus on delay.

3.33 Based on Para 4.31, also take into consideration of MID states capabilities, the following methodologies are recommended for calculation of Airport capacity:

Note 1: It may occur that the physical capacity of the aircraft parking Stand, the number of aircraft defining airport capacity in a given aerodrome, is less than the number of aircraft resulting from estimating the runway capacity for that given aerodrome; in such case, this would be the real constraint for that airport.

Note 2: Many different parameters should be considered for measuring airport capacity even in separate, but caution must be taken, normally the bottleneck factor, will determine the entire airport capacity.

a) Airport Acceptance Rate (AAR)

This is an example of a simplified methodology for determining the acceptance rate at an airport explained in ***Appendix C***. This methodology is based on the scientific process developed by the Federal Aviation Administration for establishing the acceptance rate, as outlined in FAA Order JO 7210.3X, Facility Operation and Administration. Chapter 10, Section 7.

*Note: This method also explained in ICAO Manual on Collaborative ATFM, Doc 9971, Part II at **Appendix C**.*

b) Steps to Estimate Runway Capacity in Brazil

In this model, the following sequence of events shall be followed to estimate runway physical capacity explained in ***Appendix D***:

- Step 1: Data collection
- Step 2: Estimating the runway occupancy time arithmetical mean
- Step 3: Estimating aircraft mix
- Step 4: Calculating Mean Runway Occupancy Time (MROT)
- Step 5: The physical capacity PER runway (PCR) shall be calculated for a one-hour

- Step 6: Aerodrome physical capacity calculation
- Step 7: Flight time between the OM and the THR (T)
- Step 8: Estimating the landing approach speed between the OM and the THR (V)
- Step 9: Mean speed in the final approach (MV)
- Step 10: Determination of safety separation (SS)
- Step 11: Determination of total separation between two consecutive landings(TS)
- Step 12: Calculation of the mean weighted time between two consecutive landings, taking into account total separation (MTTS)
- Step 13: Determination of the number of landings in a one-hour interval (P)
- Step 14: Determination of the number of take-offs in a one-hour interval (D)
- Step 15: Determination of theoretical runway capacity
- Step 16: Determining the declared capacity of the runway set (DCR)

3.34 Airport delays should not be considered in isolation. Capacity at a number of airports is limited and action is required to ensure that capacity is not exceeded by demand at a particular moment on the day of operations.

3.35 Maximum airside capacity is not solely reliant on runway capacity. Aprons and taxiways must be capable of maintaining sufficient traffic throughput to match runway capacity. Terminal area capacity, arrivals and departures, the terminal building, ATC staff levels, and equipment should not be neglected during the capacity declaration process.

3.36 In line with Para 4.31, also take into consideration of MID states capabilities, the following methodologies are recommended for calculation of Airspace capacity:

a) Determining Sector Capacity based on FAA methodology

This is an example of a simplified methodology for determining sector capacity at an ACC that explained in ***Appendix E***. This methodology is based on the scientific process developed by the Federal Aviation Administration for establishing the sector capacity.

Note: This method also explained in ICAO Manual on Collaborative ATFM, Doc 9971, Part II at ***Appendix*** *D.*

b) ATC Sector Capacity Calculation Model Used in Brazil

This method used to determine sector capacity takes into account the load borne by an ATCO in performing his/her tasks, and is based on the assessment of the tasks performed by the controller at times of high traffic volume, as seen in the DORATASK. This model was explained in this document at ***Appendix F***.

Capacity Assessment Process

3.37 Information developed by EUROCONTROL related to the ATFM capacity and planning assessment process is in ***Appendix G***.

3.38 Detailed, high quality assessments of ATC sector capacity may also be conducted using fast-time simulations to analyse relevant data and the effects on capacity of proposed ATS changes or improvements. Data inputs include static infrastructure data, traffic data, ATC logic, procedures and task definition, and aircraft performance data.

3.39 Steps in a sector capacity assessment methodology utilizing fast-time simulations include:

- Collect the necessary airspace and traffic data;
- Verify (with the support of local controllers) the traffic sample routes and the procedures used on a flow-by-flow basis;
- Correct, refine and insert the information into the model (done by the simulation experts). This includes the ATC procedures used in the sector, standard controller tasks, simulation parameters and aircraft performance parameters;
- Run an initial test-run of the model;
- Verify flight profiles. The knowledge of local controllers is used to adapt aircraft performance to local conditions, to define and verify sector specific controller tasks together with simulation parameters including conflict detection and resolution mechanisms;
- Consolidate a final model which is used to calculate results for all simulation scenarios, e.g. different sector configurations, different traffic samples, etc.; and
- Verify the simulation scenarios and the initial results, and if so required, do a fine-tuning of parameters.

3.40 A fast-time simulation capacity assessment methodology should use a simulation engine that reproduces the ATC environment, and should follow a reiterative process of validation involving licensed ATC staff currently active on the sector/s under assessment.

ATFM Daily Plan

3.41 ICAO Doc 9971 – Manual on Collaborative ATFM states that the organization and structure of the CDM process depends on the complexity of the ATFM system in place, and must be structured to ensure that the affected stakeholders, service providers and airspace users can discuss airspace, capacity and demand issues through regular meeting sessions and formulate plans that take all pertinent aspects and points of view into account.

3.42 Frequent tactical briefings and conferences can be used to provide an overview of the current ATM situation, discuss any issues and provide an outlook on operations for the coming period. They should occur at least daily but may also be scheduled more frequently depending on the traffic and capacity situation (e.g. an evolving meteorological event may require that the briefing frequency be increased). Participants should include involved ATFM and ATS units, chief or senior dispatchers, affected military authorities and airport authorities, as applicable.

Note: according to the approved MID ATM Operational Data Exchange process, States focal point is responsible to make required coordination at national level to cover all aforementioned aspects in Para 4.42 at cross-border and regional coordination meetings.

3.43 The output of these daily conferences should be the publication of an ATFM daily plan (ADP) and should include subsequent updates. The ADP should be a proposed set of tactical ATFM measures (e.g. activation of routing scenarios, miles-in-trail (MIT)) prepared by the ATFM unit and agreed upon by all partners concerned during the planning phase. The ADP should evolve throughout the day and be periodically updated and published.

Note: upon completion of regional MID ATM Operational Data Exchange meeting, ICAO MID office as the Secretariat is responsible to publish and share agreed ADP through ICAO MID Secure portal, Group OPSDataEX.

3.44 Feedback and review of the ADP received from ANSPs, AUs, and from the ATFM unit itself represent very important input for further improvement of the pre-tactical planning. This feedback helps the ATFM unit identify the reason(s) for ATFM measures and determine corrective actions to avoid reoccurrence. Systematic feedback from AUs should be gathered via specifically established links.

3.45 Feedback and review of the ADP received from ANSPs, AUs, and from the ATFM unit/ACCs itself represent very important input for further improvement of the pre-tactical planning. This feedback helps the ATFM coordination platform to identify the reason(s) for ATFM decision and determine corrective actions to avoid reoccurrence.

3.46 Templates for the ATFM daily plan are provided at **Form A** (template ATFM Daily Plan for after pandemic) of MID Region ATM Operational Data Exchange process which is available at this document, **Form B**.

3.47 An important component of the CDM process is post-operations analysis, including consideration of feedback from airspace users, airports operators, ATS and other ATFM units. Daily post-operations analysis conferences should be held, supplemented where necessary by conferences called to assess the outcomes of programs of ATFM measures responding to non-normal situation.

ATFM Terminology and Phraseology

3.48 Recognizing the lack of a current, globally standardized ATFM terminology, ICAO MID ATFM TF/6 and ATM SG/7 considered to use the terminologies developed by ICAO Asia/Pacific at ***Appendix I*** in ATFM communications.

3.49 ICAO MID ATFM TF/6 and ATM SG/7 ATFM considered to use the phrases at ***Appendix I*** for ATFM coordination, and in air-ground communications.

Note: The ATFM terms and phrases are for use as an interim procedure, pending development of globally standardized ATFM-related terminology and phraseology.

ATFM System Communications

3.50 Regional and Global interoperability of communications is critical to the implementation of effective, network-based cross-border ATFM.

3.51 Based on the last version of ICAO MID Air Navigation Strategy (ICAO MID Doc 002) endorsed by MIDANPIRG/18, the thread FICE, element B0/1 (Automated basic inter facility data exchange (AIDC/OLDI)) has been identified as the MID priority for implementation. In performing this objective, through MID Doc 002 at Attachment A, the list of MID Region AIDC/OLDI applicability area with priority 1 and 2 in ***Attachment B*** have been agreed.

Note: The current level of equipment and automation at the MID region is not mature enough to support ATFM interoperability requirement, further decision in this regard is pending future research and development.

ATFM Information Distribution

3.52 As endorsed in MIDANPIRG/18, conclusion 18/29, ICAO MID Secure portal, Group OPSDataEX is designated for distribution and sharing of ATFM data/information in the MID region.

Note 1: In addition of the above, States may have their own equipment for distribution of ATFM information based on bilateral/mutual agreement with their adjacent FIRs. In this regard ICAO MID recommend States to use the Template of Flow Management Letter of Agreement in ***Appendix H****.*

Note 2: Recognizing that States' needs for ATFM may vary, where necessary ATSUs may participate in collaborative ATFM without having the need for dedicated ATFM systems or terminals. The Aeronautical Fixed Service (AFS) may provide a suitable method for distribution of ADP and ATFM measure information to such ATSUs at level 1.

3.53 Considering the scope and performance objectives for level 2 ATFM in the MID region, Table 1 outlines the minimum items of ATFM information that ATFM systems and processes should share by using multi-nodal ATFM network concept.

Estimated	**Calculated**	**Actual**	**Applicable**
EOBT		AOBT	Terminal Gate
	CTOT	ATOT	Departure Runway
ETO	CTO	ATO	RFIX or AFIX
ELDT	CLDT	ALDT	Arrival Runway
Other			
ADP			

<u>Meteorological Information for ATFM</u>

3.54 The accuracy of pre-tactical and tactical demand and capacity assessment is reliant on the predictability of events that will impact capacity. In the case of weather-related constraints, the traditional Annex 3 services in support of aerodrome and En-route operations do not fully address the needs of ATFM. While globally, MET authorities are working steadily towards the institutional provision of Meteorological Services to support the Terminal Area (MSTA), there is a greater urgency for ATFM providers to collaborate closely with Met service providers to develop products that bridge the gap between the traditional information.

3.55 When predicting the capacity of an airport with regard to forecast meteorological conditions, it is important to not only consider the runway/s and immediate airport surroundings, which are covered by the Aerodrome Forecast (TAF) to a distance of 8km, but to also take into consideration the ability for air traffic to flow via the terminal area on the normal arrival routes and instrument approach procedures to that airport. In particular, weather affecting the airspace in the vicinity of the primary holding areas and initial approach fixes can have a significant impact on the delivery of flights into the approach airspace and onto the runway.

3.56 The current Annex 3 provisions do not include provisions for meteorological information that specifically support the determination of weather impact on capacity. OPMET information is typically pilot and/or tactical ATC oriented, with limited ATFM orientation. , and are largely produced in coded text format, which makes rapid interpretation difficult for ATM officers.

3.57 ICAO Annex 3 requires that each Contracting Sate shall determine the meteorological service which it will provide to meet the needs of international air navigation, and that this shall consist of the provision of meteorological information to users that is necessary for the performance of their respective functions. Therefore, to enable rational and quantifiable capacity determination, ANSPs and Meteorological service authorities should collaborate closely to define meteorological services to be provided to support ATM and ATFM decisions, based on specific impact to operations. Such targeted MET information should address key thresholds for various weather criteria which have a quantifiable impact on airport and terminal airspace capacity, such as headwind, crosswind, visibility, ceiling, wind shear, and convective weather at the initial approach fix (IAF) or in the vicinity of critical arrival fixes, holding points and sequencing areas preferably in the form of matrix that could be produced, with intuitive colour coding for quick recognition by ATM staff. In terms of the wider Terminal area, similar defined criteria, thresholds and colour coding can enable rapid interpretation of impact on operations.

3.58 When identifying criteria to be used in determining MET services, consideration should be given to thresholds for meteorological elements that result in a change of runway operating mode, such as:

- a change of runway dependency;
- a change of spacing between arriving aircraft;
- a change in nominal aircraft approach speeds;
- an exceedance of aircraft operating limitations for significant numbers of aircraft (e.g. maximum crosswind component);
- an inability to commence an approach via the IAF; or
- an inability to hold in the primary published holding areas, etc.

3.59 When considering the lead time requirements for such forecast products, it is necessary to strike a balance between the desired probability and accuracy and the target ATFM aircraft population.

3.60 Given the direction towards Regional ATFM through ground delay programs, it is therefore desirable that the forecast period cover at least 6-8 hours ahead to encompass the majority of regional length flights with notification of ATFM measures an acceptable time before estimated off blocks time (EOBT).

3.61 The current MID Air Navigation Strategy (MID Doc 002) identified the following AMET elements as priority one in the MID Region that can support ATFM Level I:

- AMET B0/1 (Meteorological observations products);
- AMET B0/2 (Meteorological forecast and warning products);
- AMET B0/3 (Climatological and historical meteorological products); and
- AMET B0/4 (Dissemination of meteorological products).

3.62 The following AMET elements also considered as priority two in the MID Region that would support ATFM Level II:

- AMET B1/1 (Meteorological observations information);
- AMET B1/2 (Meteorological forecast and warning information);
- AMET B1/3 (Climatological and historical meteorological information); and
- AMET B1/4 (Dissemination of meteorological information).

MID Region ATFM Implementation history and progress

3.63 So far, the following activates have been done by ICAO MID office in contribution and support of MID member States, international and regional organization (ACAO, IATA, CANSO, AEROTHAI, EUROCONTROL, MAAR and MIDRMA) and voluntary states out of the region (Brazil, India, Thailand and USA (FAA)) to study ATFM implementation in the MID region:

- The ICAO MID ATM SG/1 (Cairo, Egypt, 9 – 12 June 2014):

  a) apprised, in accordance with the Questionnaire circulated to States on 7 March 2014, related to the application of ATFM in the MID Region, the majority of the MID States indicated willingness to participate in a regional ATFM service/system; and

  b) agreed to consider the implementation of Bilateral, Sub-regional or regional ATFM services in the initial MID Region High Level Airspace Concept.

- The ICAO MID MSG/4 (Cairo, Egypt, 24 - 26 November 2014) assigned ATM SG to develop the Draft Project Proposal addressing the necessity, feasibility, cost benefit analysis and timelines related to the eventual implementation of a regional/sub-regional ATFM system, to the MSC/2 meeting for consideration.

- The ICAO MIDANPIRG/15 (Bahrain, 8-11 June 2015):

a) recalled that ATFM has been identified as one of the global air navigation priorities;
b) agreed that the ASBU Block 0-NOPS be added to the list of priority 1 ASBU Block 0 Modules in the MID Region Air Navigation Strategy;
c) noted that the MAEP SC/1 (Dubai, UAE, 20-22 January 2015) agreed to include in the MAEP Master Plan a project related to a regional/sub-regional ATFM system; and
d) agreed on decision 15/16, Collaborative Air Traffic Flow Management (ATFM-CDM) that, the ATM Sub-Group develop a Preliminary Project Proposal addressing the necessity, feasibility, and timelines related to the eventual implementation of a regional/sub-regional ATFM system, for consideration by the MAEP Steering Committee.

- MAEP SC/2, (Cairo, Egypt, 11-13 April 2016) emphasized the importance of the project. However, it was agreed that the project implementation could be initiated after 2017, providing that all the enablers/prerequisites are implemented and taking into consideration the initiatives carried out by States.

- ICAO MID ATFM Seminar, (Dubai, UAE, 13-15 December 2016) recommended the following:

  a) establishment of a ATFM TF/WG under the ATM SG;
  b) development of ATFM CONOPS taking into consideration Asia Pacific and Europe experiences;
  c) need to raise awareness about ATFM;
  d) conduct training courses related to ATFM;
  e) States to consider the establishment of ATFM Cell or National Operation Centre composed of all concerned Stakeholders;
  f) carry out a survey to determine airspace and sector capacity, hotspots, ATFM systems/measures, etc.;
  g) expedite MID IFPS project implementation; and
  h) continue working on airspace improvements.

- ICAO MIDANPIRG/16 (Kuwait, 13 – 16 February 2017) encouraged States and Stakeholders to implement the Recommendations emanating from the ATFM Seminar. Accordingly, the meeting agreed to decision 16/16, ATFM Task Force.

- ICAO MID ATM SG/3 (Cairo, Egypt, 22 – 25 May 2017) agreed on the ATFM Task Force Terms of Reference (ToRs) and assigned the first quarter of 2018 for the ATFM TF/1 meeting. In this meeting, also India shared their experiences to establish Central ATFM.

- ICAO MID ATFM TF/1 (Muscat, Oman, 23 – 25 September 2018):

  a) shared knowledge and experiences gained by India (C-ATFM), AEROTHAI (Distributed Multi-Nodal ATFM Project), CANSO (CADENA), EUROCONTROL (Network Manager) and UAE (SWIM Gateway); and

  b) established the ATFM Core Team composed of experts from; Bahrain, India, Oman, Qatar, Saudi Arabia, UAE, USA, AEROTHAI, ACAO, CANSO, EUROCONTROL, IATA and ICAO to follow-up on the agreed actions by the ATFM TF.

- ICAO MID MSG/6 (Cairo, Egypt, 3 – 5 December 2018):

  a) recalled that the ATFM TF Concept of Operations for the MID Region and requested India, USA, AEROTHAI, CANSO, EUROCONTROL, IATA, MAAR and MIDRMA to support the commitment of MID Region ATFM TF;

b) noted that the MID Office circulated a Questionnaire based on the one used in ASIA Pacific and the Americas, which would be considered as basis for the actions that will be undertaken by the ATFM TF; and

c) reviewed and endorsed the TORs of the ATFM TF by MSG decision 6/18.

- Joint ACAO/ICAO ATFM Workshop (Casablanca, Morocco, 17-18 March 2019):

  a) recognized that:

     - a regional solution to manage the traffic flow across the MID Region became a priority;
     - collaboration between all stakeholders is a key success for effective development and implementation of regional framework for ATFM/CDM;
     - development of ATFM Concept of Operations requires inputs/data from all stakeholders to ensure it meet the projected objectives; and
     - sharing information is the most important enabler for ATFM/CDM.

  b) Recommend States to:

     - establish ATFM framework at the national level (regulations, organizational structure, functions, operating procedures, etc.);
     - develop ATFM National Implementation Plan;
     - ensure that ATFM personnel are trained and qualified to effectively carry out their tasks. ATFM Manager (decision maker) should have adequate ATC experience;
     - carry out necessary studies to determine airspace and airports capacities;
     - exhaust all measures that would increase capacity and continue working on the airspace improvements and the enhancement of the air navigation services within their relevant FIRs taking into consideration the airspace users' requirements;
     - support the implementation of the IFPS at regional level;
     - ensure the implementation of the Collaboration Decision Making (CDM) concept; and
     - support flight data exchange between for the management and monitoring of air traffic flow at regional and inter-regional levels.

  c) ATFM TF is invited to:

     - develop a training programme template to be used by States;
     - develop a Template for National ATFM Implementation Plan;
     - support States in carrying out their airspace and sector capacity studies ACAO and ICAO, supported by ATFM experts as required, are invited to:
       i. organize workshops and training courses related to ATFM.
       ii. conduct visits to States to support the ATFM Implementation

- ICAO MID ATFM TF/2 meeting (Casablanca, Morocco, 19 – 20 March 2019) shared India Case Study toward Cross Border ATFM, Outcome of the First ATFM Core Team Meeting in (Abu Dhabi, UAE, 22 – 24 January 2019) and UAE Development related to ATFM.

- ICAO MIDANPIRG/17 meeting (Cairo, Egypt, 15 – 18 April 2019):

  a) noted that the ATFM TF have been supported by Brazil, India, FAA, ACAO, AEROTHAI, CANSO, EUROCONTROL and IATA. The meeting encouraged States to implement the Recommendations emanating from the ACAO/ICAO ATFM

Workshop (Casablanca, Morocco, 17 – 18 March 2019);

b) agreed that the Recommendations should be considered during the development of the ATFM CONOPS;

c) based on the analysis of the survey results carried out by the ATFM TF, recognized that the MID Region is still in the first steps related to the establishment of ATFM capabilities. Accordingly, the meeting agreed that raising awareness related to ATFM and qualifying ATFM Specialists should be given high priority;

d) agreed with the ATFM TF/2 meeting and endorsed conclusion 17/22 that the Multi-Nodal Concept should be applied for the MID Region as a first phase, which would be evolved to a centralized ATFM system in the future;

e) the ATFM Task Force develop the ATFM Concept of Operations for MID Region, accordingly, including the minimum flight data that should be exchanged by ATFM Units; and

f) the Action Plan for the implementation of ATFM in the MID region endorsed by conclusion 17/23.

- ICAO ATM SG/5 meeting (Aqaba, Jordan, 1 – 4 December 2019):

  a) noted the flight planning issues in processing some of the published ATS routing schemes and/or ATM restrictions, which are used as ATFM measures. Accordingly, the meeting encouraged IATA to coordinate with the States concerned for visits to discuss and rectify the situation;
  b) agreed that the development of guidance for the harmonization and unifying of the publication of ATM measures and restrictions would support in rectifying the above reported issues;
  c) invited IATA and ICAO to address the subject to the ATFM Task Force and AIM SG; and
  d) urged States to take necessary measures to ensure the establishment of ATFM service at the national level.

- ICAO MIDANPIRG/18 meeting (Virtual, 15 – 22 Feb 2021) agreed with the ATFM TF/4 and endorsed:

  a) conclusion 18/28 the MID ATFM CONOPS version 1.1; and
  b) conclusion 18/29 the MID ATM Operational Data Exchange process.

- ICAO MID ATFM TF/5 meeting (Virtual, 25-27 May 2021):

  a) agreed to develop MID ATFM Framework; and
  b) conducted virtual breakout meeting to brief MID States focal points regarding ICAO MID Data Exchange process.

Training and Competencies for ATFM Personnel

3.64 An ATFM service must be staffed by personnel with sufficient knowledge and understanding of the ATM system they are supporting and the potential effects of their work on the safety and efficiency of air navigation. To ensure this and within the framework of their training policy, States and ANSPs should establish training plans to ensure that ATFM service staff are properly trained.

3.65 ICAO Doc 9971, Manual on Air Traffic Flow Management, recognizes the requirement for training all stakeholders in an ATFM service, i.e. those directly operation and ATFM function and all other ATFM stakeholders including airspace users and ATS personnel.

3.66 ***Appendix J*** provides generic guidance on ATFM training requirements, which States may consider for inclusion in any existing or planned ATFM training programs.

Note: *in addition of the above, States may consider EUROCONTROL training courses for Air Traffic Flow and Capacity Management (ATFCM) in the following link.*

EUROCONTROL Training Zone - ATFCM Basic [NMO-ATFCM-BASIC]

4. Current Situation

MID ATFM CORE TEAM - ACT/1

4.1 ICAO MID ATFM TF/1 (Muscat, Oman, 23 – 25 September 2018) made a decision to establish MID ATFM CORE TEAM. The first meeting (Abu Dhabi, UAE, 22 - 24 January 2019) reviewed the responses to the survey received from 10 MID States out of 15 as per the consolidated table at ***Attachment C***. It was recognized that the MID Region is still in the first steps related to the establishment of ATFM capabilities. Accordingly, supporting States with the qualification of experts in ATFM as well as raising awareness should be given high priority.

4.2 The meeting discussed all the scenarios for the implementation of ATFM at the regional level and agreed to consider only four scenarios to be presented to the ATFM TF/2 meeting.

4.3 The meeting agreed to a set of criteria to be used for the evaluation of the scenarios based on the severity of the challenge to achieve the criteria as well as its weight/importance on the success of the scenario. The scenarios and their evaluation results are at ***Attachment D***.

4.4 The meeting emphasized that establishing a centralized ATFM Unit would be the optimal solution followed by the scenario in having 2 Centres for 2 participating areas, then a centralized scenario through a third party providing the ATFM service and the last one would the Multi-Nodal. However, considering the challenges, feasibility and time and efforts required, the Multi Nodal Scenario achieved the highest Score.

4.5 The meeting noted that for Asia Pacific Multi Nodal project; three document have been prepared and agreed upon by the States: CONOPS, Regional Framework and Common Operating Procedures, which would be used as basis for the development of the MID Region Documentation.

4.6 The meeting agreed that in order to start working on the ATFM CONOPS a decision should be made related to the framework to be implemented. In this respect, the meeting agreed to the following high level outline to be considered during the development of the CONOPS:

Phase I- Building State's National ATFM Capabilities:

1- Raising awareness related to ATFM
2- Establishing the regulatory framework for ATFM at national level
3- Establishment of ATFM Services within the ATS organizational structure (FOC, FMP, FMU, etc.)
4- Human resources
5- Training
6- Operating Procedures
7- National ATFM Team to ensure Collaborative Decision Making (CDM)
8- Tools to be used
9- Determine and declare Airspace and airports capacity
10- Establishment of State's National ATFM CONOPS

Phase II – Establishment of Regional Framework

1- Setting up the concept/framework for Cross border ATFM in the MID Region
2- Define which ATFM Measures would be required including GDPs (where applicable to be defined by States)
3- Agreement on the Format of the ATFM Messages
4- Means to be used for Communication between adjacent States ATFM FOC

5- Development of Common Operating Procedure (COP)
6- Agreement on LoA template for ATFM (***Appendix H***)
7- Agreement on the coordination procedures
8- Signature of LoAs between adjacent ATFM FOC
9- Establishment of platform to be used for sharing of information

Note: ICAO MID ATFM CONOPS based on the Multi Nodal Scenario has been developed and endorsed by MIDANPIRG/18.

Phase III- Implementation of Cross border ATFM

1- Exchange of information through the established platform and/or periodic daily teleconferences
2- Sharing of the ATFM Daily Plan
3- Implementation of the ATFM/CDM process for regulating traffic when required (regional and later inter-regional)
4- Post Implementation Review
5- Research and future development

MID Regional Activities for Implementation of ATFM

4.7 ANSPs in the MID Region currently have limited ATFM/CDM procedures in place to manage the traffic flows within their Flight Information Regions (FIRs). There is also lack of regional agreement to manage traffic flows between ANSPs. Some MID States do have some tools and processes to monitor and predict resource utilization, but the predictions are not always accurate, automated, or cross-border shared.

4.8 Strategic balancing of capacity at airports in the MID Region is currently undertaken through the airport slot allocation process or the application of Minimum Departure Intervals (MDIs). During the pre-tactical and tactical ATFM phases1, balancing of arrival demand with the available capacity at airports is mostly reactive in nature. Planning ATFM measures ahead of time is difficult because the demand data are not generally accurately predicted and there is limited control of departures. As a result, most of the demand balancing is carried out by ANSPs within their own area of responsibility through tactical flow management in some FIRs with the support of arrival management systems (AMAN). This reactive management of demand often results in inefficient means of balancing flows, such as airborne holding and vectoring.

4.9 A challenge in terms of implementing an advanced ATFM system within the Region is the high percentage of international traffic. This characteristic poses a challenge to implementation due to the cross-border effect of ATFM measures such as Ground Delay Programs (GDPs) that assign flights with Calculated Take-Off Times (CTOTs) to comply with. Current, flights departing from airports outside of the ANSP’s controlling authority operate as they originally intended, without absorbing all or even some of the delay. Accordingly, a new cross-FIR boundary concept is proposed to overcome this challenge and effectively apply ATFM measures to flights operating into constrained airports and airspace, while operating from airports or in the airspace of a different control authority.

4.10 There are, however, several ANSPs in the MID Region controlling significant domestic traffic, such as Egypt, Iran, Iraq and Saudi Arabia, where GDPs might be effective with only domestic traffic operating in accordance with assigned slots.

[1] Strategic, Pre-Tactical and Tactical ATFM Phases are defined in ICAO Doc 9971 – *Manual on Collaborative Air Traffic Flow Management*

4.11 Taking into consideration the advantages of the XMAN, the MIDANPIRG meeting urged States to support the implementation of the initiative in the Region, wherever it is possible.

Note: The Cross Border Arrival Management (XMAN) is a operational procedure utilized by Air Traffic Service Units of multiple States that aims to improve and optimize arrival management operations for major airports. XMAN reduces the drawbacks of pro-longed holding in stacks, such as, fuel burn, CO_2 emissions and noise. With XMAN procedure the holding time of an aircraft is cut by reducing their cruising speed during the final en-route phase of flight, several hundred miles away from the airport.

Status of Implementation of a Collaborative ATFM in the UAE

4.12 As it was reported to ATFM TF/1, the UAE is committed to implement enhanced and Collaborative ATFM to allow a holistic approach for balancing demand and capacity. The implementation will be based on the principles of:

a) Involvement of aviation stakeholders like ATSUs, airspace users, airports and military.
b) Network View – A holistic view of flights including the business assessment of the airspace users to support decision making.
c) Predictability – Only high-quality real-time information allows for maximum efficiency and effectiveness of flow measures.
d) Transparency – All stakeholders shall have access to the same set of information.
e) Compliance Monitoring – to demonstrate the effectiveness and aiming for continuous improvements.
f) Equity – All Airspace Users will be treated fairly and equally.

4.13 The air traffic flow challenges in the UAE are predominantly determined by international departures and arrivals at UAE airports. Together these constitute almost 80% of the traffic. During peak hours the traffic demand exceeds the arrival capacity on a daily basis while departing traffic needs to be restricted due to regional constrains not under the control of UAE. Environmental circumstances such as adverse weather, holiday seasons, and regional events may cause excessive overload situations and flow disruptions.

4.14 As of today, two ATFM system components are available in the Emirates FIR to respond to excessive traffic demands for arriving and departing traffic. No ATFM measures are imposed to en-route traffic by the UAE.

Outcome of ICAO MID ATFM Survey

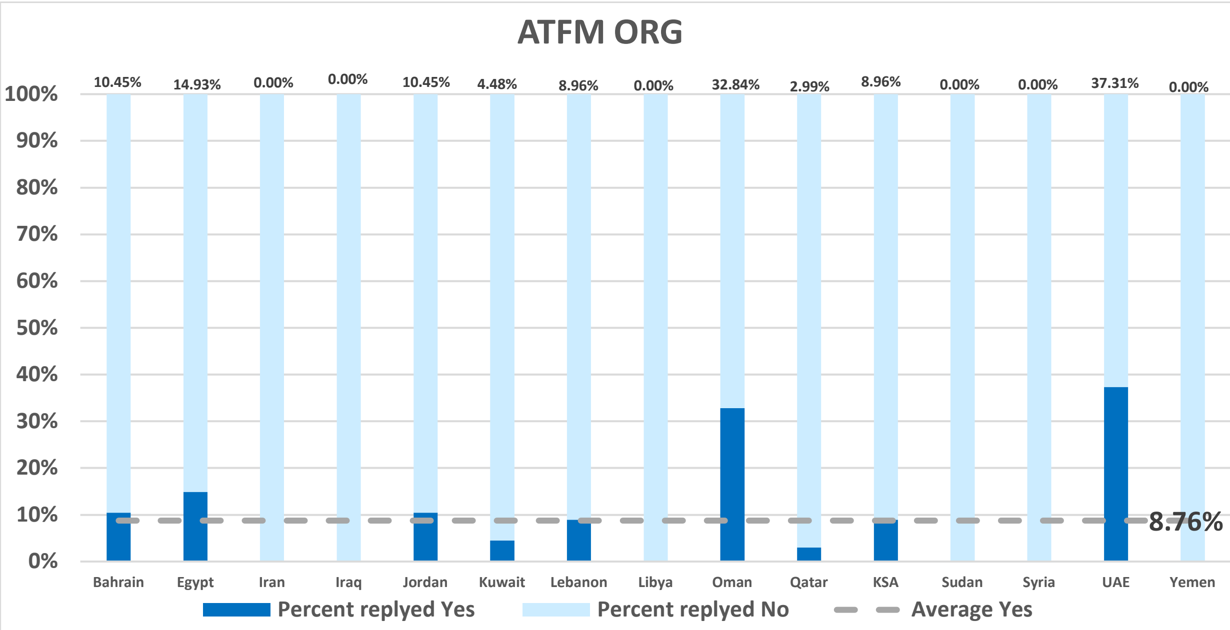
4.15 This survey has been done by ICAO MID office based on ICAO MID ATFM Seminar, (Dubai, UAE, 13-15 December 2016) recommendation. The outcome of survey, has explained the situation of ATFM in the MID region in the following aspects:

Note: 10 MID States including Bahrain, Egypt, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan and UAE replied to ICAO MID Questioner.

a) ATFM Structure and Organization

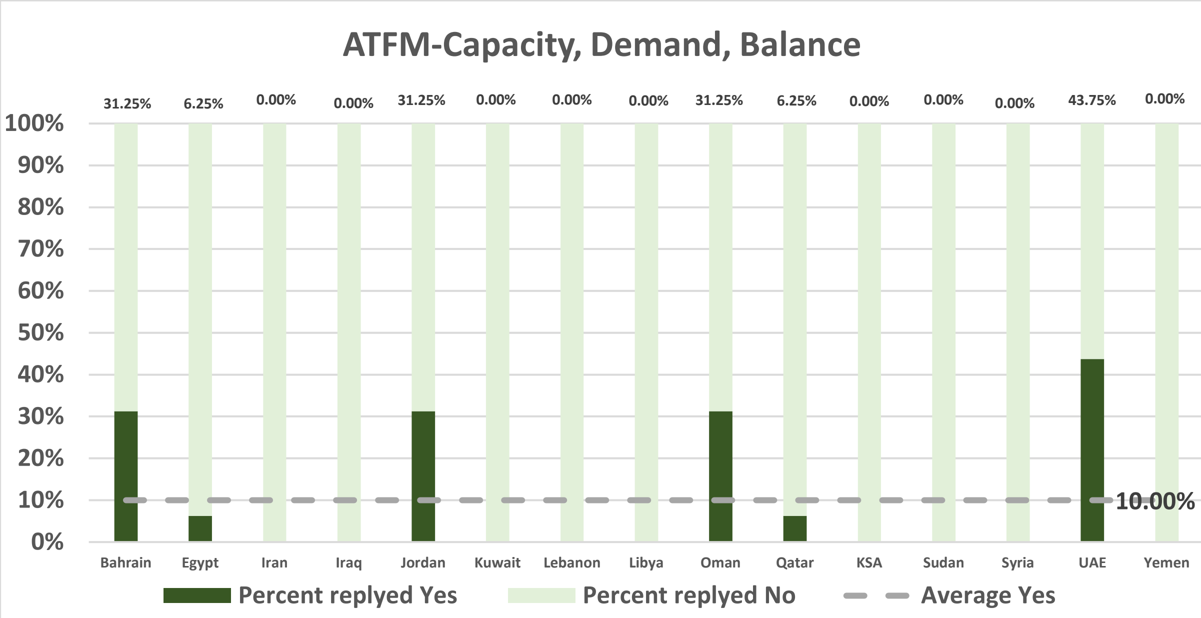
- 5 States implemented regulatory requirement for ATFM
- 6 States implemented operational requirement for ATFM
- 6 States implemented/planned to implement ATFM initiatives
- 3 States implemented/planned to implement organizational facilities for provision of ATFM services

- None of the MID States dedicated resources for ATFM function and position
- None of the MID States established Letter of Agreement with adjacent FIR(s) and Stakeholders regarding implementation of ATFM
- 3 States implemented/planned to implement CDM procedure among stakeholders
- 5 States implemented/planned to implement ATFM Daily Plan and collect, analyse, coordinate and dissemination of ATFM information.
- 4 States implemented/planned to implement CDM participation process through teleconference and web based interfaces to update flight plan intent information
- 2 States planned ATFM training for their relevant personal and stakeholders
- 2 States planned Electronic ATFM display system Shared with adjacent FIRs and stakeholders.



b) ATFM - Capacity, Demand, Balance

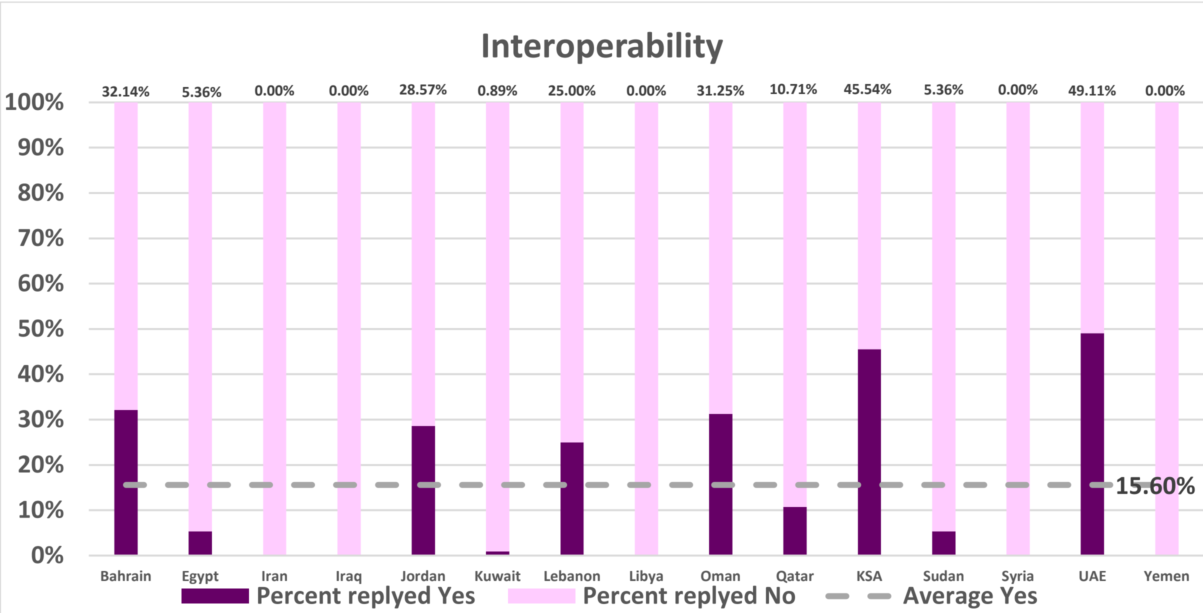
- 5 States declared/planned to declare ATC strategic capacity values for airspace, waypoint and airport
- 2 States determined declared capacity values
- 3 States have strategic airport arrival/departure slots
- 3 States have a methodology to balance demand and capacity in different phase of ATFM
- 5 States implemented/planned to implement procedures review and tools to identify available capacity, compare capacity to forecast demand and establish performance targets including airspace design review, ATFM support tools, procedure review, staffing resources to workload/traffic review, ATFM Training completed and forecast demand



c) Interoperability

- 9 States complete automated exchange of ATS messages (e.g. FPL, CHG, CNL, DEP, DLA, EST, ARR, CPL) with any, all adjacent FIRs or other non-adjacent FIRs.
- 8 States have plans to complete automated exchange of ATS messages with any or all adjacent FIRs or other non-adjacent FIRs.
- 2 States exchange Airport Acceptance Rate (AAR) information for primary airports with other FIRs.
- 1 State share adjacent sector capacity information with other FIRs.
- None of the State have automated Pre-tactical demand monitoring capability for airport, sector and ATS route.
- 1 State has automated Tactical demand monitoring capability for airport, sector, ATS route and arrival management.
- 2 States have Strategic, Pre-tactical and Tactical planning agreements with other FIRs.
- 4 States identified airports, sectors of airspace or routes which are regularly requiring ATFM Measures to balance demand and capacity.
- 9 States initiated/implemented the ATFM Measures internally
- 7 States determining ATFM measure based on demand exceed capacity, weather, military exercises, resource, maintenance/outage and VIP movement.
- None of the State declared that military airspace/activity cause the use of ATFM Measures
- 3 States declared that military airspace/activity included in strategic planning
- 4 States declared the effectiveness of ATFM Measure analyse
- 5 States declared airport, sector and ATS route capacity as primary demand-capacity imbalance reasons for the ATFM Measures.
- 6 States initiate the ATFM Measures with adjacent FIRs.
- 3 States/ANSPs carry out any post-operations analysis.
- 4 States ATFM Measures included in their LOAs.
- 6 State communicate ATFM Measures through automated or verbal communication with adjacent FIRs.

- 2 States have future ATFM initiatives planned with other FIRs.
- Until December 2018, the status of implementation of related ATFM ASBU threads in MID states is as follows:
  - 1 State implemented and 5 States planned to implement B0-A-CDM.
  - 1 State implemented and 4 States planned to implement B0-RSEQ (Improved Traffic Flow through Runway Sequencing (AMAN/DMAN)).
  - 1 State implemented and 5 States planned to implement B0-FICE (Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration).
  - 2 States implemented and 4 States planned to implement B0-DATM (Service Improvement through Digital Aeronautical Information Management).
  - 1 State implemented and 5 States planned to implement B0-FRTO (Improved operations through Enhanced En-Route Trajectories).
  - 5 States planned to implement B0-NOPS (Improved Flow Performance through Planning based on a Network-Wide view).
  - 3 States planned to implement B1- A-CDM (Optimized Airport Operations through A-CDM Total Airport Management).
  - 4 States planned to implement B1-RSEQ (Improved Airport operations through Departure, Surface and Arrival Management).
  - 4 States planned to implement B1-FICE (Increased Interoperability, Efficiency and Capacity through FF-ICE/1 application before Departure).
  - 4 States planned to implement B1-DATM (Service Improvement through Integration of all Digital ATM Information).
  - 4 States planned to implement B1-SWIM (Performance Improvement through the application of System Wide Information Management (SWIM)).
  - 4 States planned to implement B1-NOPS (Enhanced Flow Performance through Network Operational Planning).
  - 5 States planned to implement B1-AMET (Enhanced Operational Decisions through Integrated Meteorological Information).
  - 4 States planned to implement B1-TBO (Improved Traffic Synchronization and Initial Trajectory-Based Operation).



5. Performance Improvement Plan

Note: prior to implementation, ATFM systems and procedures should be verified by safety assessment under State Safety Management Systems.

Structure of the Performance Improvement Plan

5.1 Regional collaborative ATFM performance objectives are arranged in Regional ATFM Capability phases aligned, where practicable, with Priority I and II of the ICAO MID Strategy Plan (MID Doc 002).

Phase Priority I – expected implementation by 31 December 2022; and

Phase Priority II – expected implementation by 31 December 2024.

5.2 Recognizing the short lead time between the finalization of the Framework and Phase I, Regional ATFM Capability Phase I is divided into sub-phases A and B, with expected implementation 31 December 2021 and 31 December 2022 respectively.

5.3 Performance objectives are presented under the following general structure for each Regional ATFM Capability Phase, where relevant:

a) ATFM Regulations
b) ATFM Systems
c) Strategic, Pre-Tactical or Tactical ATFM
   - Capacity and Demand Monitoring and Analysis
   - Capacity Improvement
   - ATFM Execution
   - ATFM Measures
   - Post-Operations Analysis

ATFM Program Airports

5.4 ATFM Program Airports, referenced in the performance objectives, are:

a) The busiest MID Region aerodromes as defined in the MID Strategy plan (MID Doc 002);
b) Airports where strategic slot allocation is implemented under these performance objectives; and
c) All other airports designated by the relevant authority as requiring or potentially requiring ATFM implementation.

Note: prior to implementation, ATFM systems and procedures should be verified by safety assessment under State Safety Management Systems.

REGIONAL ATFM CAPABILITY PHASE IA (Expected implementation duration, 1 year)

ATFM Regulations

5.5 All States where air traffic demand at times exceeds, or is expected to exceed declared capacity, should enact regulations for the implementation of ATFM (Annex 11 to the Convention on Civil Aviation section 3.7.5 refers).

Strategic Capacity and Demand Monitoring and Analysis

5.6 A regular program of bi-annual strategic airport and airspace capacity and demand analysis should be implemented for all international airports and associated terminal area airspace, and for all en-route ATC sectors supporting the busiest MID city pairs, including consideration of:

a) CNS systems;
b) ATC resources and capability;
c) ATC separation standards and techniques;
d) runway occupancy times;
e) seasonal schedules; and
f) historical traffic data and traffic growth forecasts.

5.7 Where strategic analysis indicates that demand does not yet exceed capacity, preparation for the implementation of ATFM capability should be based on careful analysis of current traffic and expected growth in the next 5 years;

Pre-Tactical Capacity and Demand Monitoring and Analysis

5.8 Daily pre-tactical airport and airspace capacity and demand analysis should be conducted for all ATFM Program Airports and associated terminal area airspace, and for all en-route ATC sectors supporting the busiest MID city pairs, including consideration of:

a) expected runway and airspace configurations;
b) forecast meteorological phenomena;
c) ATC resources, facilities and equipment;
d) other known or expected capacity constraints; and
e) updated flight schedule and flight plan information.

Pre-Tactical ATFM Execution

5.9 ATFM Daily Plan (ADP) for all ATFM Program Airports and associated terminal area airspace, including airport and airspace capacity declarations and related background information, should be prepared and distributed to all relevant stakeholders. ADP should be distributed to stakeholders by either:

a) Web-based ATFM network; or
b) Web-pages hosted by each participating ANSP; or
c) Email distribution.

*Note: relevant stakeholders includ*e:

a) Neighbouring ATFMUs or, where not provided, ATSUs
b) ATSUs supported by the originating ATFMU;
c) Relevant airport operators; and
d) Participating aircraft operators.

5.10 ADP should be coordinated by the responsible ATFMU or ATSU and agreed with all relevant stakeholders, through chairing and/or participation in scheduled and, where necessitated by changes in airport or airspace capacity or other events, ad-hoc ATFM conferences for pre-tactical ATFM planning.

Post-Operations Analysis

5.11 The accuracy and effectiveness of capacity and demand analyses and ADP preparation and distribution, including supporting information listed in paragraph 7.7, should be verified through comparison with operational outcomes observed, and rectification of discrepancies included in planning for system and process improvements.

REGIONAL ATFM CAPABILITY PHASE IB (Expected implementation duration, 1 year).

ATFM Systems

5.12 Operational FPL and ATS message distribution systems and processes should be analysed and, where necessary, modified to ensure that FPL, CHG, DEP, DLA and CNL messages are originated, distributed and processed in accordance with the requirements specified in ICAO Doc. 4444 PANS-ATM.

5.13 Requirements should be published in all relevant State AIP, specifying that, except where necessary for operational or technical reasons, FPL should be submitted not less than 3 hours prior to EOBT.

5.14 A DLA message should be transmitted when the departure of an aircraft, for which basic flight plan data FPL has been sent, is delayed by more than 15 minutes after the estimated off-block time contained in the basic flight plan data.

5.15 Where the delay is the result of a GDP, the DLA message should be sent by the ATFMU responsible for the destination airport, addressed to the ATS unit serving the departure aerodrome for subsequent transmission in accordance with the provisions of ICAO Doc 4444 PANS-ATM.

5.16 Appropriate procedures should be implemented to ensure that FPL are not discarded from other ATM systems as a consequence of ATFM delay.

5.17 ATFM, AMAN/DMAN and A-CDM systems should be integrated through the use of common fixes, terminology and communications protocols to ensure complementary operations.

Note: FIXM version 3.0 or later, extended where necessary is the agreed format for exchange of ATFM information in the MID Region. Where full ATFM network communications capability is not yet established, ATFM messages conforming to ADEXP version 3.1 may be used for distribution of ATFM measures.

Capacity Improvement

5.18 Airport and terminal airspace capacity should be increased through optimized ATC separation standards and techniques and reduced runway occupancy at all ATFM Program Airports and in associated terminal area airspace.

5.19 Where necessitated by demand, and using a performance-based approach, terminal area ATS route structure improvements including CCO/CDO should be implemented to reduce ATC and pilot workload and enable better use of aircraft capability to meet ATFM measures.

Strategic ATFM Execution

5.20 Implement strategic airport slot allocation at all international airports, for periods where demand significantly exceeds the airport's capacity.

Pre-Tactical Capacity and Demand Monitoring and Analysis

5.21 Pre-tactical modelling of expected airport and airspace configuration and traffic demand, and the effect of ATFM measures, should be implemented for all ATFM Program Airports and associated terminal area airspace.

Pre-Tactical ATFM Execution

5.22 CDM capability should be implemented, enabling the sharing of all relevant information with all stakeholders, providing continuous availability of information and common reference material for daily and ad-hoc ATFM conferences.

Tactical Capacity and Demand Monitoring and Analysis

5.23 Dynamic update of airport and airspace capacity constraints, capacity calculation, demand information using schedule, flight plan and ATS messaging, and ATM system information and modelling of tactical ATFM programs should be implemented.

Tactical ATFM Execution

5.24 Tactical ATFM at ATFM Program Airports should be implemented using:

i. Ground Delay Programs (CTOT), or

ii. Minutes in trail (MINIT) or miles in trail (MIT) or other ATFM measures specified in ICAO Doc 9971 – Manual for Collaborative ATFM.

5.25 All States should ensure that local ATC procedures and, where available, CDM processes facilitating compliance with received CTOT are implemented.

Note 1: At controlled aerodromes, CTOT compliance should be facilitated through the cooperation of the aircraft operator and the issuance of ATC clearances. As a minimum, CTOT should be made available to the relevant ATC tower and the aircraft operator;

Note 2: For flights departing aerodromes where an ATC service is not provided, CTOT information should be made available to the aircraft operator and the first ATS unit providing services to the flight.

Note 3: States planning to implement ground delay programs should ensure adequate time is provided for local procedure development and promulgation at aerodromes where CTOT will be applied.

5.26 CTOT for individual aircraft should, where necessary, be revised, cancelled, suspended or de-suspended.

5.27 Tactical ATFM should be implemented for operations through constrained airspace sectors, only during periods affected by the constraint.

5.28 As far as practicable, individual aircraft should not be subject to more than one tactical ATFM measure per flight.

Post-Operations Analysis

5.29 Procedures and agreements should be developed to ensure post-operational analysis of cross-border ATFM programs, including the canvassing and consideration of feedback from airspace users, airports operators, ATS and other ATFM units. Daily post-operations analysis conferences should be held, supplemented where necessary by ad-hoc conferences called to assess the outcomes of programs of ATFM measures responding to non-normal situations.

5.30 The results of post-operations analyses should be used for planning ATFM, airspace and ATS route improvements.

Note: ICAO Doc 9971 – Manual on Collaborative ATFM Part II-4-8 provides guidance on post operations analysis

REGIONAL ATFM CAPABILITY PHASE II (Expected implementation duration, 3 years).

ATFM Systems

5.31 Distributed multi-nodal ATFM information distribution capability utilizing FIXM version 3.0 (or later) should be implemented, including:

i. Sharing of ADP and dynamically updated demand and capacity data for all ATFM program airports, and for en-route airspace supporting the busiest city pairs and high density major traffic flows;

ii. Slot allocation information for all flights subject to ATFM programs, including as a minimum CTOT, CTO and CLDT information;

iii. Authorized user functions for slot amendment, cancellation or suspension (ATFMU), and slot-swapping (aircraft operator and ATFMU); and

iv. Automated slot compliance monitoring and reporting, supplemented where necessary by authorized inputs by ATFMU, ATSU or airspace operator.

5.32 Full interoperability of cross border ATFM, A-CDM, AMAN, DMAN, ATM automation and airspace user systems should be implemented, utilizing FIXM 3.0 (or later) , to provide seamless gate-to-gate collaborative ATFM operations.

Pre-Tactical Capacity and Demand Monitoring and Analysis

5.33 Automated modelling of expected airport and airspace configuration and traffic demand, and the effect of ATFM measures, should be implemented for all ATFM Program Airports and associated terminal area airspace and, where possible, en-route airspace supporting the busiest MID Region city pairs and high density major traffic flows.

Tactical Capacity and Demand Monitoring and Analysis

5.34 Meteorological services to support ATM in the terminal area (MSTA) should be implemented, including near-term or now-casting forecasts of convective weather activity at or affecting ATFM Program Airports and associated instrument approach procedures, terminal area ATS routes and holding points and other significant locations.

Note: Annex 3 requires that States ensure the quality management of meteorological information.

Tactical ATFM Measures

5.35 ATFM measures including MIT, MINIT and, where necessary, CTO at AFIX or RFIX, should be applied to flights through constrained airspace.

5.36 Ground Delay Programs utilizing CTOT should be applied to:

i. aircraft destined for constrained ATFM Program Airports, that have not yet departed; and

ii. aircraft planned to operate through constrained airspace where tactical ATFM measure CTO at RFIX or AFIX is in place, that have not yet departed.

5.37 ATFM systems should have the capability to take into account long haul flights.

5.38 Systems should be in place to ensure the timely update of estimate information for airborne aircraft.

6. Research and Future Development Possibilities

Research and Development

6.1 Version 1.0 of the Regional Framework for Collaborative ATFM provides the initial framework for implementation of a distributed multi-nodal ATFM network, as envisaged in the Regional ATFM Concept of Operations. This concept will continue to develop as experience is gained through trials and subsequent operational implementation. The Framework is therefore iterative in nature, and will require regular update in the medium term.

6.2 Further research and development of the distributed multi-nodal ATFM network concept will largely be conducted by ATFM/TF participating States through their operations trial programs, consistent with Principle of the ICAO MID Strategy Plan (Doc 002). The outcomes of trials and lessons learned from operational deployment will be considered by ATFM/TF for the improvement and updating of the Framework.

ATFM Interface Control Document

6.3 The ATFM Core Team will develop an operational requirements document and an ICD for networked, cross-border multi-nodal ATFM information exchange, to be delivered to ATFM/TF for consideration before then being referred to the 7th Meeting of the ATM Sub-Group of MIDANPIRG (ATM/SG/7) in November 2021.

Collaborative ATFM Concept Developments

6.4 The following concepts should be researched, and developed, for implementation in the MID Region:

Delay Absorption Intent – included in the Regional ATFM Concept of Operations, provides aircraft operators with the flexibility to choose how to distribute the delay assigned by an ATFM measure to various phases of flight. Not yet included in the ATFM Performance Improvement Plan, this concept has the potential to improve outcomes by increasing the number of aircraft participating in the program, through the application of ATFM delays to longer distance flights that are currently exempt from ground delay programs. The development of this concept will be undertaken in trials before then being potentially included in the broader Framework.

FIXM Extension – may be required for implementation of any MID Region ATFM practices or procedures that are not covered in FIXM version 3.0 or later versions deployed by States.

Application of ATFM Measures to Long Range Flights – will improve equity in ATFM processes, and contribute to better outcomes in those ATC sectors where long range flights are currently exempt from all but minimal en-route delays. This will require further development of ATFM measures the CTO ATFM measure, and the formulation of regionally agreed limits on the total ATFM+AMAN delay that may be applied to long range and ultra-long range flights.

Interoperability of ATFM, AMAN/DMAN and A-CDM systems – will require ANSPs and airport operators to collaboratively develop their local operational letters-of-agreement to incorporate procedures and practices optimizing gate-to-gate flow management of flights.

Collaborative Trajectory Options – provide for flexible routing options that permit aircraft operators to elect to re-route flights via longer trajectories to avoid constrained airspace and take advantage of the reduction or removal of ground delay (or en-route delay, where implemented) that would be imposed if the flight continued through the constrained airspace. A collaborative trajectory options program would significantly improve the safety and efficiency of ATM in cases of large scale weather deviations (LSWD) such as those experienced in the cyclonic weather season in the Gulf region, and contingency operations including the avoidance of airspace that is either unsafe (e.g. volcanic ash cloud) or unavailable. A collaborative trajectory options program would first require a full understanding of airspace capacity, which should be supported by a comprehensive study.

Note: The development of a collaborative trajectory options program in the MID Region will require a coordinated multi-partite effort to improve the regional ATS route network and ATS surveillance/communications infrastructure, and to provide sufficient ATS route options for the program. ATS route specification and implementation of surveillance and communications infrastructure are included in the ICAO MID Strategy Plan (Doc 002).

Network Collaborative Decision-Making – to provide mechanisms within the distributed multi-nodal ATFM network for the formulation of executive flow management decisions in the event of competing stakeholder priorities. This will require research and development of network suitable automated decision-support tools and associated business rules. Operational experience in the distributed multi-nodal ATFM network environment will be key to identifying the potential challenges, and formulating and testing strategies.

Harmonization of Multiple Flow Management Programs – will ensure that all ATFM measures applied are collaboratively managed to ensure that individual flights are not unduly penalized by multiple measures in one flight, and that ATFM network outcomes are more predictable. Currently aircraft may be subject to independently applied en-route and airport ATFM delays, resulting in potentially unreasonable cumulative delay over the course of a flight. A significant amount of research is being conducted, and needs to be conducted, into the effects and harmonization of multiple flow programs in multiple FIRs.

7. Milestones, Timelines, Priorities and Actions

Milestones and Timelines

7.1 ***Section 6*** of this document (Performance Improvement Plan) provides milestones and timelines for a number of elements generally aligned with the ICAO MID Strategy Plan (Doc 002) Phase I and II.

7.2 States that have not yet implemented collaborative ATFM, or having implementations that are not in accordance with the provisions of this Framework, should commence planning from the date of its approval by MIDANPIRG.

7.3 It should be noted, however, that the ATFM capability outlined in the Framework should be implemented as early as possible. The Framework timelines should under no circumstances be interpreted as limiting or deferring ATFM implementation where there is a current or expected need for it in an earlier timeframe than outlined.

Priorities

7.4 While it is a matter for each State to determine priorities in accordance with its own economic, environmental, safety and administrative drivers, States should be aware of the MID Regional Priorities adopted by MIDANPIRG, including GANP (ASBU), and the Annex 11 requirement for States to implement ATFM where there is a current or expected imbalance of demand and capacity.

Actions

7.5 This Plan is iterative in nature, and will require further development as experience is gained in operational trials of the distributed multi-nodal ATFM network concept. ATFM/TF, under its terms of reference, should continue to oversee and coordinate the development of the concept and subsequent amendment of the Framework, facilitate the coordination and alignment of CDM/ATFM programs being conducted within the Region, and review the effectiveness of existing and planned ATFM programs. An important project being conducted by the ATFM/TF is the development of a Regional Interface Control Document (ICD) for ATFM, which is expected to be completed for consideration by ATM/SG, then presented to the MIDANPIRG in February 2022.

APPENDIX A - MID ATFM Action Plan

ACTION PLAN FOR IMPLEMENTATION OF ATFM IN THE MID REGION (DATE)

Last version

Key Activities	Action		Deliverable
	No	**Description**	
Key Activity 1 Agreement on the ATFM Regional Framework	**1.**	Recommending the best Scenario for a regional ATFM framework	Recommendation
	2.	Presentation to the ACAO ANC/40	Support
	3.	Preparing a Working Paper to MIDANPIRG/17	WP
	4.	Agreement on the regional ATFM framework by MIDANPIRG	MIDANPIRG Conclusion
	5.	Presentation to the ACAO Executive Council	For support
	6.	Notifying States about MIDANPIRG/17 Conclusion and that the development of ATFM CONOPS started	State Letter
Key Activity 2 Development of Draft CONOPS	**7.**	Development of a Draft ATFM CONOPS	Draft ATFM CONOPS
	8.	Circulating the Draft ATFM CONOPS to States	State Letter
	9.	Feedback form States on the Draft ATFM CONOPS	Feedback
	10.	Consolidation of the Draft ATFM CONOPS for presentation to the ATM SG/5 meeting	Consolidated version of ATFM CONOPS
	11.	Agreement on the Draft ATFM CONOPS	Draft ATFM CONOPS
	12.	Circulating the Draft ATFM CONOPS	State Letter
	13.	Presentation to DGCA-MID/5	For Info and Support
	14.	Presentation to ACAO Executive Council	For Info and Support

Key Activity 3 Development of ATFM Regional Framework and draft Common Operating Procedures based on the agreed CONOPS	**15.**	Development of Initial Draft ATFM Regional Framework and draft ATFM Common Operating Procedures	Initial Draft ATFM Regional Framework and draft Common Operating Procedures
	16.	Agreement on the Draft Regional Framework and draft Common Operating Procedures	Draft ATFM Regional Framework and draft Common Operating Procedures
	17.	Circulating the Draft Regional Framework and draft Common Operating Procedures to States	State Letter
	18.	Feedback form States on the Draft ATFM Regional Framework and draft Common Operating Procedures	Feedback
	19.	Consolidation of a Draft Regional Framework and draft Common Operating Procedures for presentation to the MSG/7 meeting	Consolidated version of Draft ATFM Regional Framework and draft Common Operating Procedures
	20.	Presentation to ACAO Executive Council	For Info and Support
	21.	Endorsement of the ATFM CONOPS, Regional Framework and Common Operating Procedures including agreement on a roadmap for the implementation	ATFM CONOPS, Regional Framework and Common Operating Procedures
	22.	Circulation of the CONOPS, Regional Framework and Common Operating Procedures and posting them on the ICAO MID Website	State Letter
	23.	Presentation to ACAO Executive Council	For Info and Support
Key Activity 4 Implementation of the MID ATFM Regional Framework and Common Operating Procedures based on the agreed CONOPS	**24.**	Implementation of the MID ATFM Regional Framework and Common Operating Procedures	Implementation of ATFM Regional Framework and Common Operating Procedures
	25.	Implementation of ATFM framework at national level	National ATFM framework
Key Activity 5 Post Implementation	**26.**	Post implementation review	Post Implementation review
	27.	Improvement of the ATFM Regional Framework and Common Operating Procedures	Proposal for improved ATFM Regional Framework and Common

Review of the MID ATFM Regional Framework			Operating Procedures
	28.	Review and continuous improvement of the ATFM Implementation in the MID Region with consideration of establishment of centralized ATFM system for the MID Region	Continuous improvement
Key Activity 6 Training and raising awareness related to ATFM	**1.**	Development of Training Programme Template for qualifying ATFM Specialist	Training Programme Template for ATFM Specialist
	2.	Development of working arrangement for the ATFM Visits to States that would include ATFM Workshop and/or training courses	working arrangement for the ATFM Visits
	3.	Organizing an ATFM Workshop with the planned A-CDM Workshop	A-CDM/ATFM Workshop
	4.	Organizing of ATFM Training Courses	ATFM Training Courses
	5.	Conduct ATFM Support visits to States	ATFM Support visits
	6.	Conduct familiarization visits to CADENA, Singapore, India, EUROCONTROL, FAA, etc.	ATFM Familiarization Visits

Note: The Action Plan will be periodically reviewed and updated by the ATFM TF, ATM SG, and reported to MIDANPIRG; including time lines, champion and status of each activity.

APPENDIX B - MID Region ATM Operational Data Exchange Process

INTRODUCTION

1. The intention of this Operational Data Exchange process is to provide effective process for Air Navigation Service Providers (ANSPs) in order to carry out cross-border coordination with their adjacent ANSPs. taking into consideration the circumstances that would have impact on traffic flows.

2. The main objective of the procedures, is to provide a better collaborative platform for the coordination and management of traffic. during events that might cause disruption of normal traffic flows. These procedures would also support a smooth and less challenging normal operations. In this regard, the templates at Appendices A and B were developed to support coordination between adjacent area control centers (ACCs).

3. The procedures are most suitable for those States that have not implemented or established an ATFM structure yet; as well as in the ICAO Regions where no regional/sub-regional ATFM solutions had been implemented. The well-established regional or sub-regional ATFM solutions would normally ensure collaboration between their members, however, it is recognized that coordination with their adjacent States/Regions might remain a challenge.

Note 1: The procedure is not intended to replace in any form the guidance in Manual on Collaborative Air Traffic Flow Management (Doc 9971) or provisions in other ICAO documentation related to ATFM/CDM or Regional ATFM/CDM plans or guidance.

4. The procedure outlined in this process requires several layers of collaboration and coordination as follows:

a. National Level.
b. Cross border between adjacent States.
c. Multi-States Collaboration (Optional).
d. Regional level.

National Level

5. At National level, where no ATFM system is in place, a National Collaborative Decision Making (CDM) Committee should be established to coordinate the ATM issues (en-route and terminal). The Committee should be composed of representatives from entities that have involvement/impact on ATM operations (ATS, MET, AIS, CNS, SAR, PANS-OPS, regulator, airspace users, airport operators, military authorities, etc.).

6. In cases where a State already have an established Committee or other mechanism is in place, measures should be taken to ensure that it addresses ATM operations-related issues and contingency planning as well as the optimization of airspace management.

7. The CDM Committee should hold frequent (preferable daily) coordination meetings/telecoms to address the operational status and agree on the measures that should be implemented to mitigate the associated challenges.

8. A-CDM, at the airports where it is implemented, will facilitate the work of the CDM Committee, as well as for effective optimization of flight operations at the airports and relevant terminal airspaces.

9. An ATM/CDM Coordinator should be appointed to lead the communication between all stakeholders at national level, including airports, who will also act as the point of contact for cross-border coordination with the adjacent ANSPs/ACCs. It is recommended that the coordinator is an active/dynamic en-route air traffic controller/supervisor knowledgeable of the airspace with high level tactical skills, able to discuss, coordinate and explore solutions to traffic flows. Where an ATFM structure is in place, the ATFM Manager would play this role.

Cross-border Coordination

10. The relevant communication and exchange of operational information among stakeholders on a real-time basis forms the backbone of CDM. This exchange may be accomplished by a variety of means including telephone calls, web conferences, e-mail messages, and electronic data exchange including, but not limited to web page displays. The purpose of the information exchange is to increase stakeholder situational awareness, improve operational decision-making, and enhance the efficiency of the ATM system.

11. It is a significant advantage if a tool is in place to exchange information between the adjacent ACCs. Nevertheless, operational issues for discussion could be coordinated by emails and discussed via telephone. In addition, the use of web-conference applications should be considered, which improve the exchange/sharing of information through view-my-screen options.

12. It is recommended that the OPSDataEx Coordinators from adjacent States communicate together at least once daily on a suitable time for both parties that ensure all matters related to operations are addressed in a timely manner. Timing of daily teleconference should be based on either traffic distribution of associated shift changes.

13. The objective of daily teleconferences between adjacent ACCs is mainly to address the operations outlook and any factor affecting normal operations so as to agree on ATM measures to overcome challenges impacting traffic flows and operational requirements agreed upon via the ATS Letters of Agreement (LoAs).

14. The sharing of information and coordination at national, cross-border and regional levels between stakeholders provides the following tangible and measurable operational benefits:

- reduction of unnecessary delays and airborne holding due to, better planning, increased situational awareness and solutions developed via the coordination process;
- reroute flights in collaboration with neighboring ANSPs, taking into account airspace user needs;
- fuel savings due to better-coordinated tactical air traffic management;
- communicating in a timely manner the impact of special events, contingency and crisis including weather, national disaster, disruption of services, etc.;
- advance planning for the events and for post-events recovery;
- top management kept briefed and informed; and
- optimized implementation of ATFM measures due to improved view of demand and capacity predictions.

15. The Table at Form A presents Template for Daily Teleconferences between Adjacent ACCs or ATFM unitsTelecom Template to facilitate the daily discussions between adjacent ACCs or ATFM units using Form A and preparation for the resumption of normal operations. A more detailed Template for teleconferences during normal situation (after the pandemic) is provided at Appendix B. The Table Templates would form the basis for the development of ATFM Daily Plans.

Multi States Conference Calls:

16. Instead of having one-to-one daily conferences, several States may decide to organize joint teleconferences to address the topics outlined in Appendices A or B. For better management of joint teleconferences, follow-up, monitoring and reporting, a lead State/ANSP would be nominated that will ensure communication between the States members of the joint teleconferences as well as communicating and reporting as deemed necessary to the relevant ICAO Regional Office/CCT.

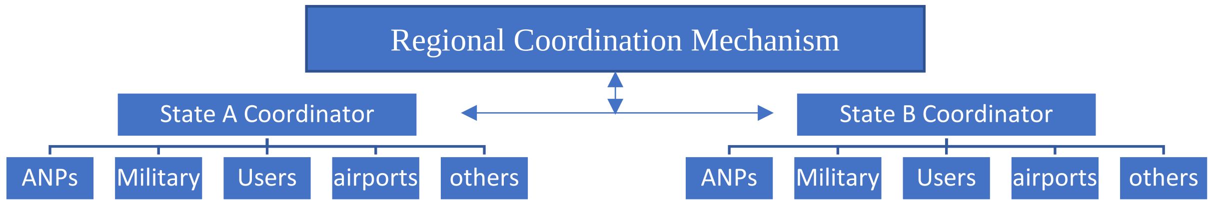
Regional Level

16. ICAO Regional Offices consolidate the inputs received from their relevant States or Group of States as well as those provided by the airspace users and share it as required for regional/inter-regional consideration through the CCT framework or any other mechanism for discussion and agreement on necessary ATM measures to mitigate the identified challenges.

17. Regional Offices organize periodic teleconferences, as deemed necessary, with States and Organizations concerned. During these regional discussions, the relevant ICAO State Letters as well as the matters reported by States and the challenges reported by airspace users should be addressed.

Note: A State could be assigned as a Collection Point for a group of States to consolidate the updates/inputs and provide them to the accredited ICAO Regional Office.

18. The chart below illustrates the coordination process:



19. The outcome of the process, is to have an idea about the expected traffic demand according to the collected data, **Form C** is provides Hourly Distribution of traffic on Entry/Exit points FIR; that could be compared to the capacity.

20. reference is made to the following guidance materials related to ATFM and A-CDM and a regional cross-border initiative:
https://www.canso.org/implementing-air-traffic-flow-management-and-collaborative-decision-aking
https://www.canso.org/guidelines-airport-collaborative-decision-making-cdm-key-performance-measures
https://www.cadenaois.org/index.html

Appendix B - Form A

Template for Daily Teleconferences between Adjacent ACCs or ATFM units

	Telecom #.			
1	Covering period (date and time)	From:	To:	*i.e. coming 12h, 24h, 5, 7 days*
2	Between State/ANSPs	State/ANSP A: [title] [Coordinator name] [email] [Telephone/mobile]	State/ANSP B: [title] [Coordinator name] [email] [Telephone/mobile]	
3	Greetings	---	----	
4	Brief Overview of the situation			
5	Describe the issues that may have impact on traffic flow during the coming period:			
	a) Weather: current or forecasted weather that would have impact on en-route or aerodrome operations such as reduced visibility, hurricanes, sandstorms, turbulence, thunderstorm activities, volcanic ash, etc.			
	b) Infrastructure (NAVAID outage, GNSS signal interference, planned maintenance, radar outage, direct COM issues, etc.) NOTAMed or planned to take place.			
	c) Military activities			
	d) Special movements			
	e) Special events			
	f) Pandemic-related issues			
	g) Others			

6	Aerodromes issues			
	a) Airport capacity			
	b) Projected terminal demand;			
	c) Anticipated ATFM measures (MDI, MIT, GSt, GDP, MINIT, etc.)			*Refer to Doc 9971 Chap 4 Section 4.5*
	d) Other			
7	En-route issues			
	a) Airspace capacity (Sector capacity)			
	b) Changes to traffic flow with highlight on relevant Entry/Exist Points.			
	c) ATS Routes status (available, closed, CDR, DCTs, etc.)			
	d) Anticipated ATFM measures (MDI, MIT, MINIT, Re-route, etc.)			*Refer to Doc 9971 Chap 4 Section 4.5*
	e) Other			
8	Coordination Process/Communication			
	a) Discuss changes to way of communication and exchange of info and coordination, of traffic between the 2 ATS units, if any. This would include, Direct Speech, AIDC/OLDI, AFTN Messages, etc.			
	b) Transfer of control points			
	c) Flight level restrictions at entry/exit points			
	d) Expected frequency changes in case of Sector opening/closure or combining sectors.			
	e) Other			
9	Other topics of mutual interest			
10	Required follow-up actions till next telecom			
11	Agreement what and who will report any relevant information or decisions to the relevant ICAO Regional Office and/or CCT			
12	Summary			

Appendix B - Form B

Template for Daily traffic demand between Airspace users and ANSPs

No	Flt No.	DEP	ARR	ETD	ETA	Operating Days							FR1-FR2			FR2-FR3			FR3-FR4			FR4-FR5…			Priority/phase	Remarks
						Sundays	Mondays	Tuesdays	Wednesdays	Thursdays	Fridays	Saturdays	WP/Fix	Time	FL	WP/Fix	Time	FL	WP/Fix	Time	FL	WP/Fix	time	FL		
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
13																										
14																										
15																										
16																										
17																										

Appendix B - Form C

Hourly Distribution of traffic on Entry/Exit points FIR

Note	*Declared Capacity:*	*Defined number of traffic that could be accepted on each point taking into consideration the available FLs, separation, ATCO workload, airspace complexity, etc.*
	No. of traffic:	*Based on inputs received form airlines or FPLs (Appendix C)*
	The spreadsheet could also be used to analysis the distribution of traffic and impact of rerouted traffic due to contingency situation.	
	% columns and Total column are formulas based for automatic calculation	

No.	**Way Points**	**E=Entry X=Exit B=both**	**0:00z**			**1:00z…**		
			Declared Capacity	**No. of Traffic**	**%**	**Declared Capacity**	**No. of Traffic**	**%**
1								
2								
3								
4								
5								
6								
7								
8								
9								

APPENDIX C - Calculation of the Aerodrome Acceptance Rate (AAR) used by the FAA

Administrative considerations

a) identify the organization responsible for the establishment and implementation of AARs at select airports;
b) establish optimal AARs for the airports identified; and
c) review and validate the airport primary runway configurations and associated AARs at least once each year.

Determining AARs

Calculate optimal AAR values for each airport runway configuration for the following weather conditions:

a) visual meteorological conditions (VMC): weather allows vectoring for visual approaches;
b) marginal VMC: weather does not allow vectoring for visual approaches, but visual separation on final is possible;
c) instrument meteorological conditions (IMC): visual approaches and visual separation on final are not possible; and
d) low IMC: weather dictates Category II or III operations.

Calculate the optimal AAR as follows:

a) determine the average ground speed crossing the runway threshold and the spacing interval required between successive arrivals;
b) divide the groundspeed by the spacing interval to determine the optimum AAR;
c) formula: ground speed in knots at the runway threshold divided by spacing interval at the runway threshold in miles.

Note: When the quotient is a fraction, round down to the next whole number, as shown in the example below, or use Table II-App C-1.

Example:

130 kt/3.25 NM = 40 Optimum AAR = 40 arrivals per hour
125 kt/3.0 NM = 41.66 round down to 41
Optimum AAR = 41 arrivals per hour

Table II-App C.1. Optimum AAR

	NM between aircraft at the runway threshold									
	3	**3.5**	**4**	**4.5**	**5**	**6**	**7**	**8**	**9**	**10**
Ground speed at the runway threshold	Potential AAR									
140 kt	46	40	35	31	28	23	20	17	15	14
130 kt	43	37	32	28	26	21	18	16	14	13
120 kt	40	34	30	26	24	20	17	15	13	12
110 kt	36	31	27	24	22	18	15	13	12	11

Identify any conditions that may reduce the optimum AAR, including:

a) intersecting arrival and departure runways;
b) lateral distance between arrival runways;
c) dual use runways — runways that share arrivals and departures;
d) land and hold short operations;
e) availability of high-speed taxiways;
f) airspace limitations and constraints;
g) procedural limitations (noise abatement, missed approach procedures);
h) taxiway layouts; and

i) meteorological conditions.

Determine the adjusted AAR using the factors listed above for each runway used in an airport configuration:

a) add the adjusted AARs for all runways used in an airport configuration to determine the optimal AAR for that runway configuration;
b) real-time factors may require dynamic adjustments to the optimal AAR, including:
    1) aircraft type and fleet mix on final;
    2) runway conditions;
    3) runway/taxiway construction;
    4) equipment outages; and
    5) approach control constraints;
c) formula: potential AAR – adjustment factors = actual AAR, expressed as shown in Table II-App C-2

Table II-App C-2. Example of actual AAR

Runway configuration	**AAR for VMC**	**ARR for marginal VMC**	**ARR for IMC**
RWY 13	24	21	19
RWY 31	23	20	17

APPENDIX D - Steps to Estimate Runway Capacity in Brazil

CALCULATING RUNWAY PHYSICAL CAPACITY

The following sequence of events shall be followed to estimate runway physical capacity:

Step 1: Data collection:

Runway occupancy time (ROT):
Recording in specific forms, constant values in Tables 1 and 2, respectively, Runway Occupancy Time during Take-Off (ROTT) data collection form, and Runway Occupancy Time during Landing (ROTL) data collection form, the runway occupancy times during take-off and landing operations distributed in their respective categories:

TABLE 1				
COLLECTION OF RUNWAY OCCUPANCY TIMES DURING TAKE-OFF (ROTT)				
SITE:	**DATE:**		**RUNWAY:**	
REGISTARY	**TYPE**	**CAT**	**TIME**	**REMARKS**

TABLE 2				
COLLECTION OF RUNWAY OCCUPANCY TIMES DURING LANDING (ROTL)				
SITE:	**DATE:**		**RUNWAY:**	
REGISTARY	**TYPE**	**CAT**	**TIME**	**REMARKS**

Note 1: These data shall be collected next to the control tower or ATS unit of the aerodrome under study. Note 2: The "remarks" column shall contain any data relevant to the validation of the collected data. For example: through which TWY has the aircraft cleared the runway after landing; or how long has the aircraft remained aligned after being cleared for take-off.

Step 2: Estimating the runway occupancy time arithmetical mean: Each of the thresholds of the aerodrome shall be taken into account by inserting the referred data in Table 3 (Form to Calculate the Mean Runway Occupancy Times (ARR/DEP) by Aircraft Category). After collecting runway occupancy times, the arithmetical mean, inter alia, is estimated by aircraft category:

TABLE 3		
ARITHMETICAL MEAN OF RUNWAY OCCUPANCY TIMES DURING LANDING (MROTL), BY AIRCRAFT CATEGORY		
AERODROME	**RUNWAY**	
	CAT	**TIME (sec)**
	A	
$\sum$ ROTL$_{CATX}$/ Nº ACFT$_{CATX}$	**B**	
	C	
	D	
	E	
ARITHMETICAL MEAN OF RUNWAY OCCUPANCY TIMES DURING TAKE OFF (MROTT), BY AIRCRAFT CATEGORY		
	CAT	**TIME (sec)**
	A	
$\sum$ ROTT$_{CATX}$/ #ACFT$_{CATX}$	**B**	
	C	
	D	
	E	
ARITHMETICAL MEAN OF RUNWAY OCCUPANCY TIMES (AMROT), BY AIRCRAFT CATEGORY		
AERODROME	**RUNWAY**	
	CAT	**TIME (sec)**
	A	**AMTOTA**
($\sum$ MROTL + $\sum$ MROTT)/2	**B**	**AMTOTB**
	C	**AMTOTC**
	D	**AMTOTD**
	E	**AMTOTE**
AMROTA= $\frac{\mathbf{MROTTA+MROTLA}}{\mathbf{2}}$	**AMROTB=** $\frac{\mathbf{MROTTB+MROTLB}}{\mathbf{2}}$	
AMROTC= $\frac{\mathbf{MROTTC+MROTLC}}{\mathbf{2}}$	**AMROTD=** $\frac{\mathbf{MROTTD+MROTLD}}{\mathbf{2}}$	
AMROTE= $\frac{\mathbf{MROTTE+MROTLE}}{\mathbf{2}}$		

Step 3: Estimating aircraft mix Based on total daily movement records obtained from any recognised statistical source that truly reflects the total movement of aircraft at the aerodrome, a weekly sample is obtained for estimating aircraft mix, and the resulting values are inserted in Table 4 (Form for Collecting Airport Percentage Utilisation Data by Aircraft Category - Mix).

TABLE 4			
AERODROME PERCENTAGE UTILIZATION BY AIRCRAFT CATEGORY (MIX)			
AERODROME:			
MONDAY		**TUESDAY**	
CAT	**# Aircraft (%)**	**CAT**	**# Aircraft (%)**
A		**A**	
B		**B**	
C		**C**	
D		**D**	
E		**E**	
WEDNESDAY		**THURSDAY**	
CAT	**# Aircraft (%)**	**CAT**	**# Aircraft (%)**
A		**A**	
B		**B**	
C		**C**	
D		**D**	
E		**E**	
FRIDAY			
CAT	**# Aircraft (%)**		
A			
B			
C			
D			
E			
TABLE 4 (CONT.)			
		MIX	
		CAT	**# Aircraft (%)**
		A	
$\sum$**#ACFT$_{CATX}$/#DAYS**		**B**	
		C	
		D	
		E	

The value of the mix shall be determined by comparing the percentages, by day of the week, of the total number of aircraft in the respective day and the total number of aircraft in each category.

The following table illustrates aircraft mix calculation:

	MONDAY		**TUESDAY**		**WEDNESDAY**		**THURSDAY**		**FRIDAY**	
CAT	**ACFT**	**%**	**ACFT**	**%**	**ACFT**	**%**	**ACFT**	**%**	**ACFT**	**%**
A	32	8.42%	29	7.63%	25	6.51%	39	9.86%	25	6.31%
B	55	14.47%	57	15.00%	61	15.89%	73	18.11%	66	16.67%
C	283	74.47%	283	74.47%	286	74.48%	282	69.98%	297	75.00%
D	6	1.58%	11	2.89%	11	2.86%	8	1.99%	8	2.02%
E	4	1.05%	0	0.00%	1	0.26%	1	0.25%	0	0.00%
Total	**380**	**100%**	**380**	**100%**	**384**	**100%**	**403**	**100%**	**396**	**100%**

Arithmetical	
CAT	**MIX**
A	7.71%
B	16.03%
C	73.68%
D	2.27%
E	0.31%
TOTAL	**100%**

Step 4: Calculating Mean Runway Occupancy Time (MROT) The values corresponding to runway occupancy times, by aircraft category, the constant values in Table 3, and the respective constant mix in Table 4 shall be taken to Table 5 (Calculating Mean Runway Occupancy Time), where the mean runway occupancy time (MROT) will be estimated using the weighted arithmetical mean.

<table>
<tr><th colspan="7">TABLE 5</th></tr>
<tr><th colspan="7">Calculating mean runway occupancy time (MROT)</th></tr>
<tr><th colspan="5">Aerodrome</th><th colspan="2">Runway</th></tr>
<tr><th colspan="2">AMROT</th><th rowspan="7">X</th><th colspan="2">MIX</th><th rowspan="7">=</th><th>MROT</th></tr>
<tr><th>CAT</th><th>TIME (sec)</th><th>CAT</th><th>#ACFT (%)</th><th>TIME (sec)</th></tr>
<tr><td>A</td><td></td><td>A</td><td></td><td rowspan="5"></td></tr>
<tr><td>B</td><td></td><td>B</td><td></td></tr>
<tr><td>C</td><td></td><td>C</td><td></td></tr>
<tr><td>D</td><td></td><td>D</td><td></td></tr>
<tr><td>E</td><td></td><td>E</td><td></td></tr>
<tr><td colspan="7">MROT=∑ (AMROT CATX . MIX CATX) / 100</td></tr>
</table>

Step 5: The physical capacity PER runway (PCR) shall be calculated for a one-hour period, taking into account each threshold, by dividing the cited interval, translated to seconds (3600 sec), by the mean runway occupancy time, expressed in seconds.

PCR = 3600 / MROT

Step 6: Aerodrome physical capacity calculation
It shall be based on the mean annual utilization of each runway, in terms of percentage, together with data on total monthly movements obtained from any recognized statistical source, which truly reflect the total movement of aircraft at the aerodrome from which the desired sampling will be obtained.

Runway utilization percentage (UP):
An index calculated from the total monthly movement, obtained from a sampling containing data fora one-year period. Percentages are weighted against the capacity of each runway, the end result being a single value. The following tables illustrate how to calculate runway utilization percentages:

MONTHLY MOVEMENT OF AIRCRAFT			
MONTH	**RWY A**	**RWY B**	**MONTHLY MOVEMENT**
JAN	7622	2631	10253
FEB	6364	3229	9593
MAR	9239	2409	11648
APR	9965	1184	11149
MAY	10811	896	11707
JUN	11280	291	11571
JUL	11637	620	12257
AUG	12145	263	12408
SEP	11687	273	11960
OCT	9177	2184	11361
NOV	7765	2936	10701
DEC	7487	3665	11152
TOTAL	115179		
RWY		**% UTILIZATION (UP)**	
A		86	
B		14	
TOTAL		**100**	

The mean annual percentage values per runway and the respective physical capacity values are weighted in order to obtain the physical capacity of the aerodrome, as defined in Table 6.

TABLE 6				
AERODROME PHYSICAL CAPACITY (APC) CALCULATION				
PCR	**X**	**% OF RWY UTILISATION**	**=**	**AERODROME PHYSICAL CAPACITY**
RWY A		**% RWY A**		
RWY B		**% RWY B**		
APC = $\sum$ (PCR $_{RWYX}$. %UTIL $_{RWYX}$) / 100				

THEORETICAL RUNWAY CAPACITY CALCULATION

Theoretical runway capacity is calculated for a sixty-minute interval, based on the mean runway occupancy time, taking into account ***regulatory aircraft separation, as well as the planning factors and landing and take-off operational factors*** of the aerodrome under study:

Runway occupancy times, aircraft mix, mean runway occupancy time, and annual runway utilization percentage, will be used to calculate aerodrome and runway physical capacity, constant values in Tables 1 to 6.

Step 7: Flight time between the OM and the THR (T)

Flight times between the OM and the THR of the runway under study shall be collected and inserted in Table 7A (flight time between the OM and the THR), taking into account the various aircraft categories operating in the aerodrome. After calculating the respective mean values, they must be inserted in Table 7B (mean flight time between the OM and the THR), so as to calculate the mean speeds in the final approach for all thresholds.

TABLE 7A				
FLIGHT TIME BETWEEN THE OM AND THE THR……….(T)				
OM/THR DISTANCE…………				
REGISTRY	**TYPE**	**CAT**	**TIME (SEC)**	**TIME (MIN)**

TABLE 7B		
MEAN FLIGHT TIME BETWEEN THE OM AND THE THR…………..(MT)		
OM/THR DISTANCE………….		
CAT	**TIME (SEC)**	**TIME (MIN)**
A		
B		
C		
D		
E		
MT = $\sum T_{CAT\ X}$. /# AIRCRAFT $_{CAT\ X}$		

Note 1: Time is measured from the moment the aircraft crosses the outer marker until it crosses the runway threshold, or, in the absence of an outer marker, from the start of the final approach segment until crossing the runway threshold.

Note 2: Consider the distance between the OM and the THR, in NM.

Note 3: If there is no OM, we must select a point of a known distance in the final approach that determines the impossibility for any other aircraft to enter the runway while the landing aircraft is crossing it or is in any other segment between the referred point and the threshold under study.

Step 8: Estimating the landing approach speed between the OM and the THR (V)

With the data obtained from Tables 7A and 7B, we can estimate, for each runway, the landing approach speeds between the OM and the threshold and the final approach segment (FAS)—taking into account each aircraft category--and record the values found in Table 8 (mean speed between the OM and the THR).

Note: This speed is obtained by dividing the length of the final approach segment by the mean flight time, by aircraft category, between the outer marker and the runway threshold (MT).

AVA= $\frac{FAS}{MTA}$	**AVB=** $\frac{FAS}{MTB}$	**AVC=** $\frac{FAS}{MTC}$	**AVD=** $\frac{FAS}{MTD}$	**AVE=** $\frac{FAS}{MTE}$
TABLE 8				
MEAN SPEED BETWEEN THE OM AND THR…………				
CAT		**SPEED (KT)**	**SPEED (NM/MIN)**	**SPEED (NM/SEC)**
A				
B				
C				
D				
E				
SPEED (KT) = DIST (NM)/T FLIGHT $_{OM/THR}$ (H) **SPEED (NM/MIN) = DIST (NM)/T FLIGHT $_{OM/THR}$ (MIN)** **SPEED (NM/SEC) = DIST (NM) / T FLIGHT OM/THR (SEC)**				

Step 9, Mean speed in the final approach (MV):

The weighted mean of final approach speeds, taking into account the aircraft mix.

$$\text{MV} = \frac{\text{MIXA}*\text{AVA}+\text{MIXB}*\text{AVB}+\text{MIXC}*\text{AVC}+\text{MIXD}*\text{AVD}+\text{MIXE}*\text{AVE}}{100}$$

Step 10, Determination of safety separation (SS):

The study foresees the possibility of having a take-off between two consecutive landings, but without affecting the regulatory separation minima (RSM) between incoming and outgoing aircraft that, in Brazil, are established in ICA 100-12. This requires the calculation of a safety distance to be added to the regulatory separation minima between aircraft in the approach phase in order to allow an aircraft to take off after the first has landed, without compromising its regulatory separation with the second aircraft in the approach phase.

By estimating the distance flown by the second aircraft in the final approach while the first aircraft is on the runway, and by adding the calculated distance to the adopted regulatory separation minima, we obtain the separation required between two consecutive landings.

This flown distance is obtained by multiplying the mean speed in the final approach by the mean weighted runway occupancy time.

SS = MV * MROT

Step 11, Determination of total separation between two consecutive landings (TS):

The total separation is obtained by adding the safety separation and the regulatory separation minimum. Thus:

TS = SS + RSM

There are cases in which SS can be left out. Normally, this can happen at airports that have two or more runways, where operation dynamics can be enhanced by leaving an aircraft aligned on the runway while waiting for another aircraft to land on the other runway.

Step 12, Calculation of the mean weighted time between two consecutive landings, taking into account total separation (MTTS).

The mean weighted time it takes to cover the total separation between two consecutive landings is obtained by dividing this distance by the mean weighted speed of the aircraft mix.

MTTS = TS/MV

Note: The mean time must be calculated for each threshold in the aerodrome, based on the different taxiway configurations for each threshold in use.

Step 13, Determination of the number of landings in a one-hour interval (P):

The resulting mean weighted time it takes to cover the total separation between two consecutive landings, in seconds, shall be the denominator for the number of seconds contained in an hour (3600 sec). The result will be the number of possible landings with the separation proposed for the threshold under study, according to Table 9.

TABLE 9
NUMBER OF POSSIBLE LANDING
3600 / MTTS = NUMBER OF LANDINGS
P = 1 hour / MTTS

Step 14, Determination of the number of take-offs in a one-hour interval (D):

Based on the total separation obtained, it is possible to insert a take-off between two consecutive landings. By subtracting one aircraft from the total number of landings, we obtain the possible number of take-offs within the time interval under study, according to Table10.

TABLE 10
NUMBER OF POSSIBLE TAKE-OFFS
NUMBER OF LANDINGS - 1 = NUMBER OF TAKE-OFFS
D = P - 1

Step 15, Determination of theoretical runway capacity:

Add the resulting number of landings and take-offs in the sixty-minute interval for each threshold to obtain the theoretical operational capacity for the respective threshold, according to Table 11.

TABLE 11
THEORETICAL RUNWAY CAPACITY (TRC)
THEORETICAL RUNWAY CAPACITY = NUMBER OF LANDINGS + NUMBER OF TAKE-OFFS
TRC = Landings + Take-offs

CALCULATION OF THE DECLARED RUNWAY CAPACITY

The declared capacity is estimated taking into account the percentage annual utilisation of each runway, the same as the constant value in Table 6.

Step 16, Determining the declared capacity of the runway set (DCR)

The declared capacity of the runway set is the capacity that is fully sustainable from the operational point of view, taking into account the percentage annual utilisation of each runway.

Accordingly, the weighted arithmetical mean between the utilisation percentage and the respective theoretical runway capacities is estimated.

Thus:

$$\mathbf{DCR} = \frac{\mathbf{UPA * TRCA + UPB * TRCB + \ldots\ldots\ UPN * TRCN}}{\mathbf{UPA + UPB \ldots\ldots\ldots UPN}}$$

Note: It should be noted that, as stipulated in DOC 9426, an ATC unit can not operate at full capacity throughout the whole operating shift, since there are several variables that significantly reduce capacity at certain times. Therefore, it is advisable to adopt percentages between 80% and 90%, thus giving more flexibility to capacity values, that is, an ideal interval that preserves the safety of air operations.

CONCLUSION

In order to maintain air traffic flow close to optimum conditions, avoiding possible system overloads, the CGNA has conducted studies to standardize the methods for estimating runway capacity, in the hope of analyzing demand/capacity evolution at each airport, and to make recommendations to the airports involved for the sake of operational harmony.

The method presented herein is intended to show the use of the runway capacity calculation model in a general and simplified manner, and does not contemplate the many peculiarities of the aerodromes where it will be applied. Therefore, when conducting studies to determine aerodrome runway capacity, all factors that might affect the indices should be taken into account.

APPENDIX E - Determining Sector Capacity based on FAA Methodology

Sector capacity is determined using the average sector flight time in minutes from 7 a.m. to 7 p.m., Monday through Friday, for any 15-minute time period.

The formula used to determine sector capacity is:

$$\frac{(\textbf{average sector flight time in minutes}) * (\mathbf{60}\ \boldsymbol{seconds})}{\textbf{36 seconds}} = \boldsymbol{sector\ capacity\ value\ optimum}$$

The steps to follow are:

a) manually monitor each sector, observe and record the average flight time in minutes;
b) after that time is determined:
    1) multiply that value by 60 seconds in order to compute the average sector flight time in seconds;
    2) then divide by 36 seconds because each flight takes 36 seconds of a controller's work time; and
    3) the result is the sector capacity value (optimum).

Example:

a) 20 flights are observed in the sector in 15 minutes;
b) Add the flights individual sector times together 120 minutes;
c) Divide 120 minutes by the 20 flights to obtain the average 120 minutes = 6 minutes / flight;
d) The quotient is the average sector flight time, in minutes 6 minutes;
e) Next, multiply the average sector flight time by 60 seconds (6 minutes / flight) X (60 seconds) = 360 seconds / flight. The product is the average sector flight time, in seconds;
f) Next, divide the average sector flight time, in seconds, by 36 seconds;
   Note: 36 seconds is a value established for use in the United States by human factor experts. It represents the average time a controller interacts with a flight while it is in the sector.
g) The average sector flight time from above is 360 seconds per flight;
h) Divide 360 seconds per flight by 36 seconds (the time a controller interacts with a flight) 360 seconds per flight = 10 flights
i) The quotient, 10, is the optimum sector capacity value for the 15 minute period.

Adjustments:

The optimum value for a sector is then adjusted for factors such as:

a) airway structure;
b) airspace volume (vertically and laterally);
c) complexity;
d) climbing and descending traffic;
e) terrain, if applicable;
f) number of adjoining sectors that require interaction;
g) military operations; or h) use Table II-App D-1.

OPTIMUM SECTOR CAPACITY VALUE plus/minus +/- ADJUSTMENT FACTORS equals SECTOR CAPACITY VALUE

Table II-App D-1. Simplified method

Average sector flight time (in minutes)	**Optimum sector capacity value (aircraft count)**
3	5
4	7
5	8
6	10
7	12
8	13
9	15
10	17
11	18
12 or more	18

APPENDIX F - ATC Sector Capacity Calculation Model Used in Brazil

This methodology consists in obtaining a value based on a mathematical formula. The basic data for such formula are derived from an investigation carried out by a special working group at the ATC unit, taking into account a busy period in which controller actions and availability to manage control sector traffic are observed and timed; this provides a data sample to be used in the ATC sector capacity calculation methodology.

The number of aircraft that can be controlled simultaneously by a single controller (N) in a given sector is estimated using the following formula:

$$\mathbf{N = \Phi * \delta * (\eta * \tau_m * V_m)^{-1}}$$

Factors directly proportional to ATC capacity:

Φ (availability factor):

The controller availability factor, defined as the percentage of time available for planning aircraft separation procedures;

Based on this model, controller workload is the summation of times spent on:

1) communication (transmission/reception);
2) manual activities (filling out flight progress strips) and coordination; and
3) traffic planning and distribution.

This availability factor normally falls between a minimum value of 40% of ATCO time for non-radar control, and 60% for radar control (ICA 100-30). It is thus clear that efforts need to focus on increasing the "availability factor" φ.

The latter can only be achieved by applying measures to reduce the level of controller intervention in the activities mentioned in 1 and 2 above.

The percentage accounted for by this φ factor could increase if the "Man/Machine Interface –MMI" is enhanced; that is, when increasing the level of automation in some tasks.

δ (average distance):

Average distance flown by aircraft in the sector, which is a function of the paths and en route or terminal procedures established for each sector;

Factors inversely proportional to ATC capacity:

η (number of communication):

Number of communications for each aircraft in the sector, which must be limited to the least possible number required for an understanding between the pilot and the controller. This number can be minimized by issuing a complete clearance sufficiently in advance for flight planning;

τm (mean communication duration):

mean duration of each message. This factor can be minimized by issuing messages objectively, without long explanations that are detrimental for an understanding between the pilot and the controller; and

νm : mean speed of aircraft in the sector.

If δ and νm are replaced with the average flight time of the aircraft in the sector (T), this formula can be replaced with a simpler version:

$$\mathbf{N = \Phi * T * (\eta * \tau_m)^{-1}}$$

It is advisable to make at least 30 observations of each parameter (δ, η, τm and νm) for each controller, during peak traffic, respecting the minimum number of controllers specified by the sampling technique used.

Example:

Consider **T** (average flight time in sector) = 12 minutes, **τm** (mean communication duration) = 9 seconds which is required to express in minutes 9/60=0/15 , **φ** (availability factor) = 60%, **η** (average number of communication for aircraft) = 6, which gives a number of aircraft **N** = 8 simultaneously controlled by the controller in the given sector. In other words, in this sector and under these conditions, a controller would simultaneously control 8 aircraft.

N = 60%*12* (6*9/60) = 8

APPENDIX G - Capacity Planning and Assessment Process

1. A PERFORMANCE-DRIVEN PROCESS

1.1 The overriding objective is to develop a capacity assessment process that contributes to the requirement to: "provide sufficient capacity to accommodate the demand in typical busy hour periods without imposing significant operational, economic or environmental penalties under normal circumstances."

1.2 To address this, an annual capacity planning and assessment process — a cyclical process that identifies and quantifies the capacity requirements for the short- and medium-term — should be put in place.

1.3 To effectively determine future capacity requirements, it is necessary to monitor current capacity performance using the following indicators:

a) *average ATFM delay per flight:* the average ATFM delay per flight is the ratio between the total ATFM delay and the number of flights in a defined area over a defined period of time; and

The ATFM delay is described as the duration between the last take-off time requested by the aircraft operator and the take-off slot allocated by the ATFM function, in relation to an airport (airport delay) or sector (en-route delay) location; and

b) *effective capacity:* effective capacity is defined as the traffic volume that the ATM system in the area concerned could handle with one minute per flight average en-route ATFM delay. This capacity indicator is derived from a linear relationship between delay variation and traffic variation.

2. METHODOLOGY TO ASSESS FUTURE CAPACITY REQUIREMENTS

2.1 The objective of a medium-term planning and assessment exercise is to provide predictions of the capacity requirement for the ATM system. This can be done in different ways, but preferably through the use of a future ATM profile (FAP) involving a combination of different modelling and analysis tools (see Figure II-App E-1).

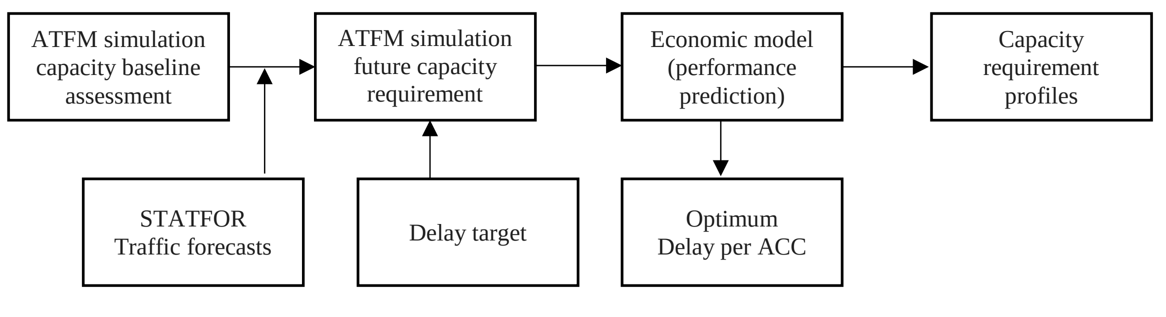


Figure II – App E-1. Key FAP processes

2.2 FAP comprises ATFM simulation facilities as well as spreadsheet and macro-based analysis and reporting tools that assess and quantify how much capacity is delivered by specific airspace volumes within the current ATM system, and evaluate the current and future capacity requirements at ACC and sector group levels. This is done according to the following steps:

Step 1: In order to provide an accurate prediction of the capacity requirements of the concerned area, it is necessary to know the **current capacity offered**. FAP should establish a **capacity baseline** for each ACC and defined sector group.

Step 2: The next task is to provide a **prediction of the future demand** on each ACC (and defined sector group) over the next 5 years, according to the expected traffic growth and distribution over the future route network.

Step 3: FAP should carry out **an economic analysis**, balancing the cost of capacity provision and the cost of delay, on the assumption that each ACC is operating at or close to its economical optimum, and that the target level of delay has been achieved.

Step 4: FAP should then produce, for each ACC in the area concerned (if more than one) and each of the defined sector groups, a **5-year capacity requirement profile**. Percentage increases with respect to the measured capacity baseline are provided.

3. EXPECTED DEMAND ON THE FUTURE ROUTE NETWORK

Medium-term capacity requirements

3.1 Medium-term capacity requirements at the ACC or sector group level can only be assessed once one has an idea of the expected traffic volume and distribution over the future route network in the area concerned. The expected demand at the ACC or sector group level should be assessed by the FAP tool from:

a) the forecast traffic growth;
b) the future route network evolution and traffic distribution, simulated by an airspace modelling tool; and
c) airport capacity constraints, assessed from information gathered from various sources on current and planned airport capacities.

Future route network evolution and traffic distribution

3.2 The capacity requirement for an ACC or sector group is clearly dependent on the distribution of traffic over the network in the area concerned, horizontally and vertically. The demand to be accommodated in the future is determined taking into account the desire of users to fly the most direct routes and optimum vertical profiles, in the context of the anticipated evolution of the route network.

3.3 Changes to the route network and traffic distribution can induce significant changes in terms of the demand (and therefore the required capacity) at individual ACCs, even during periods of reduced traffic growth.

3.4 It is assumed that aircraft will follow the shortest routes available on the network between city pairs according to the future route network, on essentially unconstrained vertical profiles. Nevertheless, some existing structural traffic distribution scenarios are retained. There is no "dispersion" of flights between equivalent routes between city pairs.

3.5 Traffic flows respecting these assumptions should be simulated by the appropriate tools and serve as an input to the FAP simulations. The result of these simulations should be a horizontal and vertical traffic distribution over the future route network, allowing the determination of the unconstrained demand in each ACC.

4. COST DATA AND ECONOMIC MODELLING

4.1 Capacity has a cost, but insufficient capacity, which in turn generates delay, has an even larger cost. Both capacity and delay costs are borne by AUs. It is therefore necessary to determine the level of ATC capacity which can be justified from a cost point of view, i.e. the optimum trade-off between delay and cost of ATC capacity.

4.2 The cost of capacity and the cost of delay are regional parameters depending on:

a) total capacity provided;
b) marginal capacity cost (ATC complexity, price index, equipment, etc.);
c) total delay generated;
d) delay sensitivity (network effects, hourly traffic distribution); and
e) cost per minute of delay (traffic mix).

4.3 Consequently, each ACC has its own capacity cost and delay cost curves. These curves interrelate as network effects within the area concerned change according to changes in capacity offered at other ACCs.

4.4 The total cost curve (the sum of the delay cost and the capacity cost) determines the optimum cost model capacity for each ACC for the current traffic demand. However, to assess capacity requirements for the future, it is necessary to incorporate the future demand into the model in an updated total cost curve for each ACC.

4.5 After the economic analysis or cost optimization for the future traffic demand is carried out, the final step in the process takes place. FAP carries out another iterative ATFM simulation by increasing capacity at the ACC offering the best return on investment (ROI), until the overall delay target is reached (see Figure II-App E-2).

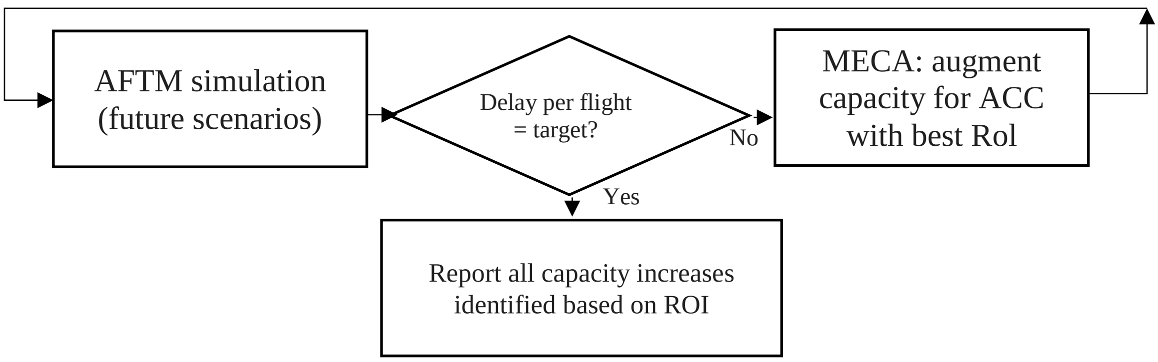


Figure II-App E-2. Iterative ATFM network simulations with best ROI to achieve target delay

4.6 When the agreed target delay is reached, the capacity target for each ACC is expressed in terms of the capacity increase that was necessary in order for the convergence to be achieved. Simulations are carried out for the final year of the planning cycle and for any year that there are changes to ACC or sector group configurations. Capacity levels are interpolated for intermediate years.

4.7 The capacity target level corresponds to the cost optimum delay for the ACC to meet the overall delay target adopted by the appropriate authority and represents the ACC capacity required to cover:

a) the expected demand; and (if appropriate)
b) the current capacity shortfall, i.e. the difference between the optimum capacity and the current capacity (as described in section 2 of this appendix)).

4.8 Figure II-App E-3 shows an ACC with an optimum capacity (green), an ACC with a capacity shortfall (red) and an ACC with a surplus capacity (blue). For the ACC with optimum capacity, the requirement is only to cover the forecast traffic increase. For the ACC with a capacity shortfall, the requirement is to cover both the shortfall and the traffic increase, and for the one with a surplus, the requirement is to achieve the optimum capacity in the medium term, without costly over-provision.

4.9 If the network delay is close to the target delay, the optimum delay at ACC level is an effective tool to identify areas that still have a capacity gap.

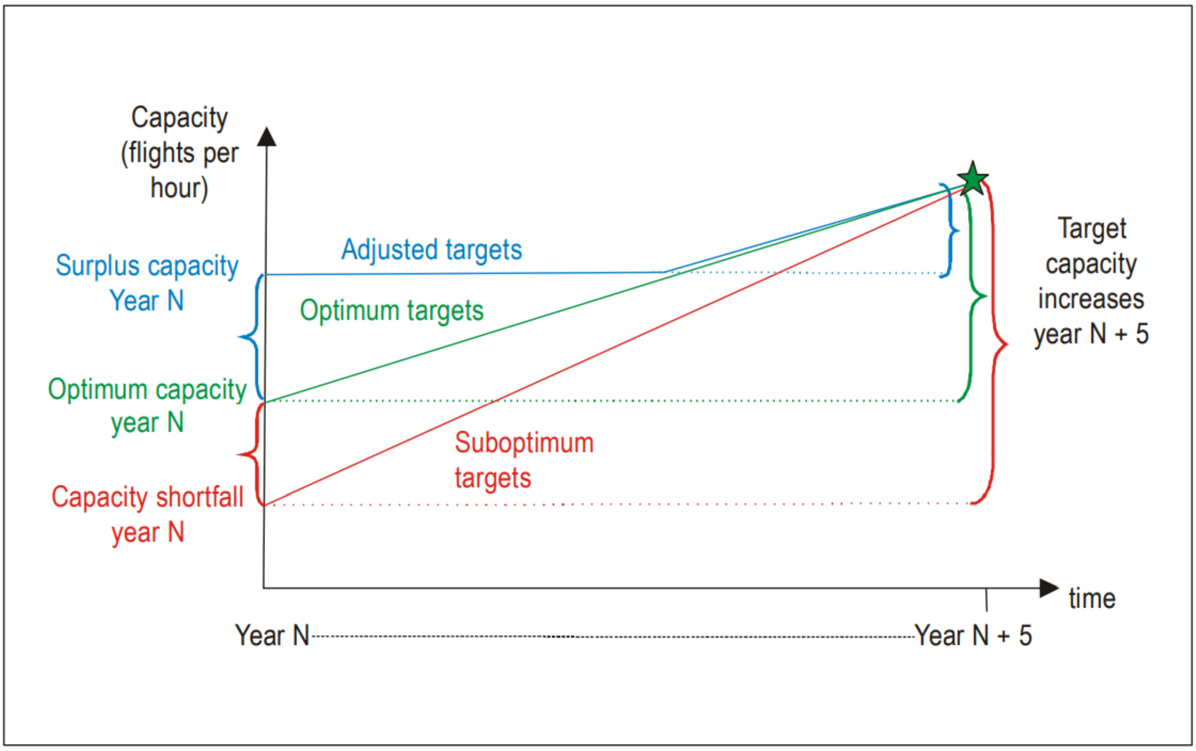


Figure II-App E-3. ACC current versus target capacity

5. THE CAPACITY PLANNING WORK PROGRAMME

5.1 Table II-App E-1 describes the different phases of the annual work programme and lists the required actions and responsibilities.

Table II-E-1. Actions, deadlines and responsibilities		
Date/Event	**Action ATFM function**	**Action ANSPs**
October–December Capacity planning meetings for the short- and medium-term	Provide all relevant data to enable the ANSP to prepare a first draft of the local capacity plan: – as data becomes available; and – at least 2 weeks before the meeting	Prepare the draft capacity plan prior to the meeting with capacity enhancement function (CEF). Ensure the participation of both planning and operational staff at the meeting.
November–December Completion of the capacity plan	Complete the capacity chapter: – by end of December	Finalize the capacity plan: – by end of November
November–February ATFM and capacity report for previous year	Coordinate and agree with ANSPs on the content with respect to the analysis of ACC performance: – by end of January Finalize report: – by end of February	Review and agree on the ACC performance analysis content provided by ATFM function: – by end of January
January Agreement and development of the medium-term capacity profile scenarios	Prepare the airspace scenario data for profile calculation following coordination with ANSPs: – by end of February	Provide ATFM function with details of configuration changes (planned or proposed) during the 5-year planning cycle for ACCs and requested sector groups: – by end of January
February Release of short- and medium-term traffic forecasts	Convene meetings and provide the forum for all relevant information to be included in the short- and medium-term forecast: – during the calendar year Provide the new medium-term traffic forecast: – by end of February Merge the short- and the medium-term traffic forecasts.	Attend the user group meetings to ensure that all information relevant to the traffic forecast is provided to the ATFM function: – by the end of December
March Calculation of medium-term capacity profiles (including optimum delay per ACC)	Calculate the optimum delay for each ACC: – by mid-March Calculate the capacity requirement profiles for ACCs and requested sector groups: – by mid-March	Agree on the capacity profiles and optimum delay per ACC for use as a basis for the local capacity plan: – by end of April
March Calculation of the delay forecast for the coming vacation season and next 2 years	Make the delay forecast for the coming vacation season and the next 2 years: – by mid-March	Ensure that the local capacity plan is up to date and accurate and communicate any changes to the ATFM function: – before mid-February
March The annual meeting of a capacity planning task force	Organize the task force meeting, invite contributions, compile the agenda and write the report.	Attend the meeting with the appropriate planning and operational participation and be prepared to share best practice capacity planning.
April Publication of the operations plan for the coming vacation season	Incorporate the vacation capacity plans into the plans: – by mid-March	Ensure that up-to-date capacity information for the coming vacation season is made available

	Release the first version of the vacation plan: – by mid-March	and that any changes are communicated to the ATFM function for inclusion in the plan: – by end of February – as they occur, throughout the vacation season
May Coordination and agreement of medium-term capacity profiles	Coordinate bilaterally with ANSPs and agree on the profiles that will be used as the basis for local capacity planning in the medium term: – by end of March Present the capacity profiles to the next meeting of the appropriate authorities for approval: – May meeting	
June Publication of the medium-term ATM capacity plan	Collect and consolidate all the local medium-term capacity plans and complete an analysis of the expected situation at network and local levels: – by end of April	
July ACC capacity requirement profiles published	Release document: – by end of July	
July–August ACC/sector group capacity baseline assessment period	Inform ANSPs of the reference dates and request confirmation of data quality: – by end of June Calculate the baselines for ACCs and requested sector groups according to the airspace structure scenarios defined for the capacity profiles: – by end of August In addition to the baseline assessment, calculate the capacity baselines using appropriate simulation and calculation tools: – by end of August	Confirm that fully accurate sector capacity and opening scheme data will be provided to the ATFM function: – 1 week before the reference period Ensure that the sector capacity and opening scheme data are sufficiently accurate for the baseline assessment: – two AIRAC cycles before the start of the AIRAC containing the measurement period
September–October ACC capacity baselines coordinated with the ANSPs	Communicate the baseline results to ANSPs on a bilateral basis for discussion and agreement: – by mid-September Present the agreed ACC baselines to the next meeting of the appropriate authorities – at October meeting	Agree on the capacity baselines for the next planning cycle: – prior to meeting of the appropriate authorities

Capacity planning meetings

5.2 Once per year, the ATFM function should visit the majority of ANSPs in the area concerned to collect information on capacity plans for the next 5 years and the coming vacation season. It is essential to the improvement of ATM capacity at the overall network level for each ACC to have a robust capacity planning process and a realistic capacity plan.

5.3 ANSP capacity plans for each ACC should be published in a local implementation plan, together with other relevant capacity information (e.g. capacity delivered during the previous vacation season, future capacity requirements, expected performance in the medium term and the current and expected capacity of major airports).

5.4 Prior to each meeting, the ATFM function provides the ANSP with a set of data to enable them to prepare the preliminary capacity plan, tailored to local conditions. The data set should include the following:

a) a report and analysis of capacity delivered during the previous vacation season;
b) the value of the (vacation) capacity baseline indicator for each ACC and requested sector group;
c) the optimum delay for each ACC to meet the network target delay;
d) a set of 5-year ACC capacity requirement profiles for high, low and medium traffic growth (shortest available routes over the future route network) and for the current route network;
e) similar capacity requirement profiles for requested sector groups;
f) detailed medium-term traffic forecast;
g) the latest short-term traffic forecast per State;
h) short- and medium-term delay forecast for each ACC;
i) differences in demand between current routes and shortest routes, and current routes and cheapest route scenarios; and
j) other relevant capacity information.

5.5 ANSPs prepare a first draft of the capacity plan for the meeting, which is discussed and updated in an interactive session, using appropriate simulation and calculation tools. To facilitate the discussion and ensure a realistic capacity plan, ANSPs should ensure the presence of both planning and operational staff.

5.6 The plan should detail the capacity enhancement actions planned each year of the capacity planning cycle, together with a realistic assessment of the contribution of these initiatives to the overall annual capacity increase.

APPENDIX H - TEMPLATE FOR LETTER OF AGREEMENT (LOA)

LETTER OF AGREEMENT (LOA)

Effective date:

Subject: Air traffic flow management (ATFM) collaboration

ANSP1 and ANSP2 enter into this LoA to facilitate the safe and efficient movement of air traffic between and over both countries.

1. PURPOSE

The purpose of this LoA is to establish continuity of operations and ATFM procedures between the flow management unit 1 (FMU1)/ACC1 in (city/country) and FMU2/ACC2 in (city/country). This LoA is not intended to replace any local agreements between ANSP1 area control centres (ACCs) and ANSP2 ACCs. This LoA will promote coordination and collaboration between FMU1/ACC1 and FMU2/ACC2 regarding traffic management measures and the routing of aircraft into and out of ANSP1 and ANSP2 airspace. FMU1/ACC1 and FMU2/ACC2 will be the primary points of contact for coordinating traffic management (TM) measures and operations between ANSP1 and ANSP2.

2. SCOPE

The procedures outlined are for use by FMU1/ACC1 and FMU2/ACC2 to provide normal air traffic services (ATS).

3. BACKGROUND

a) ANSP1 and ANSP2 have established operational agreements creating cross-border communications and a seamless operational atmosphere. This agreement incorporates FMU1/ACC1 and FMU2/ACC2 operational procedures and practices.
b) traffic flow management continues to evolve as new procedures and technologies are developed. ANSP1 TM measures may include departures from ANSP2 airports. Likewise, ANSP2 TM measures may include departures from ANSP1 airports. The TM measures coordinated by either FMU may include MIT, MINIT, ground delay measures, ground stops and re-route initiatives.

Note: This list is not all-inclusive and other TM measures may be developed and coordinated to meet operational needs either between two adjacent FIRs or during regional coordination meeting.

4. RESPONSIBILITIES

a) Responsibilities of FMU1/ACC1 Operations:

    1) FMU1 is responsible for the flow management of traffic to ANSP1 destinations and through ANSP1 airspace as follows:
        i. FMU1/ACC1 will coordinate with FMU2/ACC2 before implementing TM measures that may impact ANSP2 airports;
        ii. when ANSP2 airports are included in a TM measure, advise FMU2/ACC2:
            – before implementing the TM measure;

– what the TM parameters are; and

– when the TM measure is cancelled;

iii. FMU1/ACC1 will coordinate with FMU2/ACC2 before implementing aircraft reroutes affecting departures from ANSP2 airports or airspace;

iv. FMU1/ACC1 must include FMU2/ACC2 TM measures in the ATFM operations plan (OP) when it is likely that ANSP1 stakeholders will be affected by these measures;

2) FMU1 will ensure FMU2 is informed of situations and conditions in ANSP1 airspace that may require implementing TM measures affecting ANSP2 traffic;

b) Responsibilities for FMU2 Operations:

1) FMU2 is responsible for traffic flow management of ANSP2 destinations and through ANSP2 airspace;

i. FMU2 will coordinate with FMU1 before implementing TM measures that impact departures from ANSP1 airports;

ii. when ANSP1 airports are included in a TM measure, advise FMU1:

– before implementing the TM measure;

– what the TM parameters are; and

– when the TM measure is cancelled;

iii. FMU2 must include FMU1 TM measures in the ATFM OP when it is likely that ANSP2 stakeholders will be affected by these measures;

iv. FMU2 must coordinate with FMU1 before implementing aircraft re-routes impacting departures from ANSP1 airports or airspace;

2) FMU2 will ensure FMU1 is informed of situations and conditions, in ANSP2 airspace that may require implementing TM measures affecting ANSP1 traffic;

c) Responsibilities for FMU1 and FMU2:

1) to streamline coordination, FMU2 will be FMU1's sole point of contact with ANSP2 and FMU1 will be FMU2's sole point of contact with ANSP1 in regard to cross-border TM measures and routing of aircraft;

2) FMU1 and FMU2 will implement and manage TM measures, as necessary, to relieve congestion and to ensure the orderly flow of air traffic consistent with an equitable distribution of delays;

3) FMU1 and FMU2 will make every effort to limit the impact of TM measures on stakeholders and implement only those measures that will adequately address the system constraint;

4) the principal TM measures to be implemented will consist of MIT, MINIT, re-routes, en-route spacing measures, ground delay measures and ground stops;

Note: This list is not all-inclusive, and other TM measures may be developed and coordinated to meet operational needs.

5) FMU1 and FMU2 will collaborate on the design of preferred routes and severe weather avoidance routes that involve the use of both ANSP1 and ANSP2 airspace or resources; and

6) FMU1 and FMU2 will provide feedback and share data on the impact and assessment of joint TM measures, as required.

5. IMPLEMENTATION

The procedures outlined in this LoA will be implemented by operational personnel at FMU1 and at FMU2. The telephone numbers for FMU1 and FMU2 personnel can be found in Attachments 1 and 2, respectively.

6. REVIEW PERIOD

FMU1/ACC1 and FMU2/ACC2 agree to participate in a yearly review of this document.

Original signed by:

ANSP1-----------------------	**ANSP2 -----------------------**
Date: ------------------------	**Date: ------------------------**
FMU1------------------------	**FMU2 -----------------------**
Date: ------------------------	**Date: ------------------------**

LOA-Attachment 1

TELEPHONE NUMBERS FOR FMU1/ACC1

FMU1 Phone number(s): xxx xxx xxx

LOA-Attachment 2

TELEPHONE NUMBERS FOR FMU1/ACC2

FMU1 Phone number(s): xxx xxx xxx

APPENDIX I - ATFM Terminology and Phraseology

ATFM Terminology – General

Acronym	Term	Definition
AAR	Airport Acceptance Rate	Arrival capacity of an airport normally expressed in movements per hour
ADR	Airport Departure Rate	Departure Capacity of an airport normally expressed in movements per hour
ASD	Aircraft Situation Display	ATC Aircraft/Traffic Situation Display
AFIX	Arrival Fix	A waypoint during the arrival phase of a flight. In the context of ATFM it could a waypoint where an ATFM Measure may be applied
CDM	Collaborative Decision-Making	Process which allows decisions to be taken by amalgamating all pertinent and accurate sources of information, ensuring that the data best reflects the situation as known, and ensuring that all concerned stakeholders are given the opportunity to influence the decision. This in turn enables decisions to best meet the operational requirements of all concerned.
CDR	Conditional Route	ATS route that is available for flight planning and use under specific conditions
DFIX	Departure Fix	The first published fix/waypoint used after departure of a flight.
DMAN	Departure Manager	A planning system to improve the departure flows at an airport by calculating the Target Take-Off Time (TTOT) and Target Startup Approval Time (TSAT) for each flight, taking multiple constraints and preferences into account
FCA	Flow Constrained Area	An sector of airspace where normal flows of traffic are constrained, which could be caused by weather, military exercise etc.
FMP	Flow Management Position	A position in any ATCC that monitors traffic flows and implements or requests ATFM measures to be implemented"
GDP	Ground Delay Program	ATFM process where aircraft are held on the ground in order to manage capacity and demand in a specific volume of airspace or at a specific airport. In the process departure times are assigned and correspond to available entry slots into the constrained airspace or arrival slots into the constrained airport
GS	Ground Stop	A tactical ATFM measure where some selected aircraft remain on the ground
MINIT	Minutes in Trail	A tactical ATFM measure expressed as the number of minutes required between successive aircraft. It is normally used in airspace without air traffic surveillance or when transitioning from surveillance to nonsurveillance airspace, or even when the spacing interval is such that it would be difficult for a sector controller to measure it in terms of miles
MIT	Miles in Trail	A tactical ATFM measure expressed as the number of miles required between aircraft (in addition to the minimum longitudinal

		requirements) to meet a specific criterion which may be separation, airport, fix, altitude, sector or route specific. MIT is used to organize traffic into manageable flows as well as to provide space to accommodate additional traffic (merging or departing) in the existing traffic flows. It will never be less than the separation minima.
RFIX	En-route Fix	A waypoint during the en-route phase of a flight. In the context of ATFM it could a waypoint where an ATFM Measure may be applied
SUB	Slot Swapping	The ability to swap departure slots gives AUs the possibility to change the order of flight departures that should fly in a constrained area
-	ATFM Measure	ATFM Measure which will balance demand against capacity or assist in the safe expeditious flow of traffic

ATFM Terminology – Phase of Flight

Acronym	Term	Definition
SOBT	Scheduled off Block Time	The time that an aircraft is scheduled to depart from the parking position
EOBT	Estimated Off Block Time	The estimated time that an aircraft will start movement associated with departure
TOBT	Target Off - Block Time	The time that an aircraft Operator or Ground handler estimates that an aircraft will be ready to startup/pushback immediately upon reception of clearance from the tower.
TSAT	Target Start Up Approval Time	The time provided by ATC taking into account TOBT, CTOT and/or the traffic situation that an aircraft can expect start up/push back approval
COBT	Calculated Off Block Time	A time calculated and issued by ATFM Unit, as a result of tactical slot allocation, at which a flight is expected to pushes back / vacates parking position so as to meet a CTOT taking into account start and taxi time.
AOBT	Actual Off Block Time	The time the aircraft pushes back / vacates parking position (Equivalent to Airline / Handlers ATD – Actual Time of Departure & ACARS=OUT)
STOT	Scheduled Take Off Time	The estimated take off time derived from an aircraft operators schedule, typically based on a standard taxi-out time
PTOT	Planned Take Off Time	Time aircraft is expected to take off derived from the flight plan.
TTOT	Target Take Off Time	The Target Take off Time taking into account the TOBT/TSAT plus Estimated Taxi-Out Time
CTOT	Calculated Take off Time	A time calculated and issued by ATFM Unit, as a result of tactical slot allocation, at which a flight is expected become airborne
ETOT	Estimated Take Off Time	The Estimated take off time taking into account EOBT plus Estimated Taxi-Out Time
ATOT	Actual Take Off time	The time that an aircraft takes off from the runway (Equivalent to ATC ATD–Actual Time of Departure, ACARS = OFF)
SEET	Scheduled Estimated En-route Time	The estimated elapsed time of a flight derived from the aircraft operators schedule

ETO	Estimated Time Over	Estimated time at which an aircraft would be over a fix, waypoint or particular location typically where air traffic congestion is expected
CTO	Calculated Time Over	Time calculated and issued by ATFM Unit, as a result of tactical slot allocation, at which flight is expected to be over a fix, waypoint or particular location typically where air traffic congestion is expected (referred to in FIXM 2.0 as "Airspace Entry Time - Controlled")
PLDT	Planned Landing Time	The expected landing time of a flight derived from the flight plan
SLDT	Scheduled Landing Time	Scheduled time aircraft is expected to land on a runway, typically based on Scheduled In Block Time (SIBT) and a standard taxi-in time
TLDT	Target Landing Time	Targeted Time from the Arrival Management process at the Threshold, taking runway sequence and constraints into account; Progressively refined planning time used to coordinate between arrival and departure management processes
CLDT	Calculated Landing Time	A landing time calculated and issued by ATFM unit, as a result of tactical slot allocation at which a flight is expected to land on a runway
ELDT	Estimated Landing Time	The estimated time that an aircraft will touch-down on the runway (equivalent to ETA)
ALDT	Actual Landing Time	Actual time an aircraft lands on a runway (Equivalent to ATC ATA –Actual Time of Arrival = landing, ACARS=ON)
SIBT	Scheduled In Block Time	The Time that an aircraft is scheduled to arrive at its first parking position.
CIBT	Calculated In Block Time	An in block time calculated and issued by ATFM unit, as a result of tactical slot allocation at which a flight is expected to be at its first parking position.
AIBT	Actual in block time	The time that an aircraft arrives in-blocks (Equivalent to Airline/Handler ATA –Actual Time of Arrival, ACARS = IN)

ATFM Terminology Map

Phase of flight	**Scheduled**	**Flight plan**	**Target (Airline)**	**Target (ANSP)**	**ATFM Measure**	**Estimated**	**Actual**
Off-Block Time (OBT)	SOBT	EOBT	TOBT	TSAT	COBT		AOBT
Take-off Time (TOT)	STOT			TTOT	CTOT	ETOT	ATOT
Time Over (TO)					CTO	ETO	ATO
Landing Time (LDT)	SLDT			TLTD	CLTD	ELTD	ALTD
In-Block Time (IBT)	SIBT				CIBT		AIBT

ATFM Phraseology

Circumstance	Phraseology
Calculated take-off time (CTOT) delivery resulting from a slot allocation. The CTOT shall be communicated to the pilot at the first contact with ATC.	SLOT (time)
Change to CTOT resulting from a Slot Revision.	REVISED SLOT (time)
CTOT cancellation resulting from a Slot Cancellation	SLOT CANCELLED, REPORT READY
Flight suspension until further notice.	FLIGHT SUSPENDED UNTIL FURTHER NOTICE, DUE (reason)
Flight de-suspension.	SUSPENSION CANCELLED, REPORT READY
Start-up requested too late to comply with the given CTOT.	SLOT EXPIRED, REQUEST A NEW SLOT
Denial of Start-up when requested too late to comply with the given CTOT. (Where supported by State regulation or procedure)	UNABLE TO APPROVE START-UP CLEARANCE DUE SLOT EXPIRED, REQUEST A NEW SLOT
Start-up requested too early to comply with the given CTOT.	REQUEST A NEW SLOT
Denial of Start-up when requested too early to comply with the given CTOT. (Where supported by State regulation or procedure)	UNABLE TO APPROVE START-UP CLEARANCE DUE SLOT (time), REQUEST START-UP AT (time)

APPENDIX J - ATFM Training Requirement

General

Air traffic Flow Management is an enabler of Air Traffic Management efficiency and effectiveness contributing to the safety, efficiency, cost effectiveness and environmental sustainability of an ATM system. ATFM aims at enhancing safety by ensuring the delivery of safe densities of traffic and by minimising traffic surges. Its purpose is to balance traffic demand and available capacity.

As traffic grows, an increasing number of States are moving towards the implementation of an ATFM service. Although this is a positive development, it also generates another challenge. Because of its effect on neighbouring airspaces, ATFM needs to be coordinated between States. ATFM systems therefore need to be compatible and interoperable. In this respect, the development of coordinated and harmonised training requirements is a first step in ensuring a harmonised application of ATFM.

Once demand start to reach the levels of available ATC capacity, a functioning ATFM service becomes a vital component of safe and efficient provision of Air Traffic Control services. Therefore this service needs to be staffed by personnel with sufficient knowledge and understanding of the ATM system they are supporting and the potential effects of their work on the safety and efficiency of air navigation.

To ensure this and in the frame of their training policy, States and ANSPs should establish training plans to ensure that ATFM service staff are properly trained in order to ensure the availability, continuity, accuracy and integrity levels requested for the service provided.

ICAO Doc 9971, Manual on Air Traffic Flow Management recognizes the requirement for training all stakeholders in an ATFM service, i.e. both those directly operation and ATFM function and all other ATFM stakeholders including airspace users and ATS personnel (ref. Doc 9971 section 3.3).

Due to the complexity of the issues at hand when setting out to balance demand against available implementation options, the provision of an efficient ATFM service requires that training is approached in a systematic manner.

This document addresses the need to provide for a set of training requirements to be introduced in support of a harmonised and effective ATFM function. The document describes the requirement for training for staff having responsibilities with regard to the ATFM function. It addresses the requirement for the various levels of staff in an ATFM Unit, as well as those stakeholders affected by ATFM measures. The proposed training requirements are designed to support local application of ATFM at the same time as it prepares States for a regional application of ATFM.

It is assumed that each State and/or ANSP that will set out to train ATFM service staff will have to consider the type of equipment used in their area of operation. The material in this document is made very general when it comes to training required to operate the system that is used, and will have to be detailed based on the tools used in that particular area in support of ATFM services.

ICAO and EUROCONTROL sources were consulted for the development of the training concepts and methodology presented herein. The proposed training syllabus is derived with the support of in-depth ATFM service expertise.

Background

Regional networked Air Traffic Flow Management forms a major part of the ICAO ASBU framework since Block 0 (2013) through B0-NOPS. In support of the B0-NOPS module, ICAO enlisted a group of experts from States, ANSPs, and International Organizations with ATFM experience (ATFM Manual Coordination Team) to develop the ICAO Manual on Collaborative ATFM (Doc 9971), providing guidance on Collaborative ATFM implementation (published 2014).

Meanwhile, ICAO MID developed MID Air Navigation Strategy (ICAO MID Doc 002), kept it up to date along with ICAO GANP changes including the 6th edition which was endorsed by MIDANPIRG/18 for the propose of CDM/ATFM development to support Seamless ATM Operations in the region.

Purpose and Scope of the Document

The purpose of this document is to define a training process and specify training guidelines in order to have a common level of training for staff that operate and/or “experience” ATFM services.

In many cases an individual may already possess the required competence and experience in a particular domain and may not need to follow a formal training course on this subject. Nevertheless a process of confirm the individuals competence should still be followed. The document addresses the following:

- Who is to be trained?
- What pre-requisite skills are required or can be obtained?
- What are the job responsibilities and required competencies?
- What is the required content of ATFM training?
- What is the level of training depending on the level of responsibilities to be exercised?

Structure of the Document

The ATFM Training Requirement Guidelines consist of 5 Chapters, and 2 Appendices:

Chapter 1: Introduction
Chapter 2: ATFM Training Structure
Chapter 3: From job responsibilities via competencies to training requirements
Chapter 4: Ab-Initio ATFM Training
Chapter 5: Basic training
Appendix A: Glossary (to be included)
Appendix B: List of Abbreviations (to be included)

ATFM TRAINING STRUCTURE

A model of ATFM training

By means of ATFM training, it is expected that staff of an ATFM unit will obtain the appropriate skills to operate and maintain an ATFM function in an appropriate manner and consequently provide harmonised, homogenous and consistent ATFM services in the entire region.

In addition to the staff of the ATFMU itself, there are several other units/areas/entities where staff needs to be aware of ATFM services provided and the specific roles and responsibilities they carry in this process. Units where ATFM is exercised or directly experienced and where staff therefore needs training include:

- ATC
- Aircraft Operators
- Pilots
- Airport Operators
- Military, both service providers and users

- Regulatory bodies (CAAs and equivalent)

An ATFM service is provided at different levels, each with its own training requirements. The different levels of ATFM responsibilities considered include the operations management and supervision levels, planning and execution of the service and essential support staff. In addition, there are different support functions, CDM partners and general ATM personnel that need to be considered when developing training requirements.

This guidance document proposes a six level (taxonomy levels) set of training objectives for each ATFM population grouping depending on the level of responsibility to be exercised by each group.

Level 0: To be aware of

Level 1: A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

Level 2: The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

Level 3: A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

Level 4: The ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.

Level 5: The ability to analyse new situations in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different to those previous

(Source: EUROCONTROL Specification for the ATCO Common Core Content Initial Training).

This guidance proposes that a matrix should be constructed to determine the level of training and competency required for each group in the ATFM population. A partial matrix template is shown below. This is developed further in the document. The levels are shown for illustrative purposes only.

Subject	Operation management	Supervision	Planner	Execution	Support	CDM partner	General ATM personnel
ATM	2	2	2	2	2	1	1
ATFM	2	3	4	3	2	2	1
ATC	2	2	2	1	1	1	1
Airport operations	2	2	2	2	1	1	1
Aircraft operations	2	2	2	2	1	1	1
Meteorology	2	2	3	3	2	1	1
ICAO	3	2	2	2	2	1	1
ATFM tools	2	2	3	3	3	2	1
Capacity assessment	2	2	2	1	1	1	1
Airspace design	2	2	2	1	1	1	1

Phases of ATFM training

General

ATFM training can be divided into a number of phases. This document concentrate on training requirements for Ab-Initio and Basic training, other phases are only discussed briefly.

Ab-Initio Training

Ab-initio training is intended to ensure that new ATFM staff possesses the necessary contextual knowledge in order to follow the more detailed job related training. In many cases staff may already possess this knowledge (e.g. ATC staff will possess the necessary ATC knowledge, Airline operations personnel the necessary aircraft operations knowledge). The possession of the necessary ab-initio subject knowledge should be assessed upon recruitment / assignment. In cases where staff possess the necessary contextual knowledge these staff may be exempted in whole or part from elements of ab-initio training.

Basic Training

Basic training is the main phase where the core ATFM and associated operational topics are covered in a comprehensive fashion. Basic training also covers more detailed knowledge of subjects related to ATFM than in ab-initio training. At the successful completion of basic training the staff member should have all the relevant knowledge to proceed to on the job training before performing his role in the ATFM operation.

On the Job Training

ATFM, in common with many other operational occupations requires a substantial amount of practical application of the occupation under appropriate supervision in order to ensure that the acquired knowledge from the basic training course(s) can be applied in an autonomous manner. The purpose is to reinforce formal training and support the achievement of competency standards. If appropriate, OJT phases can also follow advanced or refresher training.

Advanced Training

As ATFM functions develop, a number of advanced ATFM analysis and application techniques are used. Secondly some staff involved in the execution of ATFM will require a higher level of skills and advance training modules will be required for both such cases. The purpose of advanced training is to augment the skills and knowledge of ATFM personnel in dealing with either more specific, complex problems or a wider breadth of issues.

Recurrent/Refresher Training

It is essential that ATFM personnel update his or her competencies in accordance with the latest operational requirements, and new methodology/technologies applied. Regular recurrent training should therefore be planned. It is important to maintain the current skills of ATFM personnel. Some ATFM techniques are applied only in very rare situations (contingency, exceptional events). ATFM personnel can be absent from their core operational function for extended lengths of time. For these three reasons recurrent/refresher training modules will be required.

Training requirements for ATFM instructors

To ensure efficient training, the trainers have to be in possession of the necessary skills. Apart from a thorough knowledge of the subject to be taught, the trainers also need to demonstrate the ability to convey the knowledge in a pedagogic and structured way. It is recommended that the trainers have attended Classroom Techniques training courses. In cases where a State is implementing an ATFM service for the first time, and thereby do not have the expertise needed to perform the training available in their country, different solutions could be considered. In cases where a system is procured to support the application of ATFM, the inclusion of a package for training of the trainers should be considered. For more in-depth knowledge of the procedures and processes involved, it may be necessary to send the staff responsible for the training to attend courses given by trainers having the experience required to train staff on the application of ATFM.

FROM JOB RESPONSIBILITIES VIA COMPETENCIES TO TRAINING REQUIREMENTS

General

Introduction

The first steps in the process of designing detailed training requirements, are to:

- Identify job responsibilities and associated performance and measurement criteria;
- Identify the competencies required to meet these job responsibilities and performance.

With full understanding of job responsibilities, it is possible to determine what the competencies are of a fully competent staff member. Items that may be needed to perform this analysis include:

- the specific job or position description or summary;
- specific ATFM organization performance requirements or competencies; and
- standard operating procedures that apply to an individual's position or responsibilities.

When the pre-requisites described above are identified and analysed, it is possible to design the training required to address the gaps through the development of the learning objectives for each competency that needs to be addressed. Based on the identification of the learning objectives, a curriculum can then be designed.

The link between ATC and ATFM

Before looking at the details of the job responsibilities of an ATFM Unit, there is a requirement to understand its links with ATC. ATFM is a cross-domain activity, and even if the focus have shifted from the early task of protecting ATC from overload to a more comprehensive demand/capacity balancing activity, there are still very strong links between ATC and an ATFM service.

The ATC Supervisor is accountable for the provision of ATC services for enroute and TMA operations within the FIR`s for which this service is being provided. As part of that responsibility, he/she is normally also accountable for all strategic and tactical ATFM decisions. In a smaller ACC the supervisor may keep that responsibility, but in a larger ACC this is often delegated to an "Airspace Manager", either being the Flow Management Position (FMP) in the ACC or the ATFM Unit (ATFMU) Supervisor.

To be able to take strategic and tactical decisions related to the application of ATFM, there is a requirement for a large measure of ATC knowledge, and when the responsibility to take these decisions is delegated to an FMP and/or ATFMU Supervisor it normally requires that the staff manning these positions have an ATC background. As management knowledge is passed on and complexity issues in sectors and at airports are documented and understood by the ATFMU, there may not be a need for this pre-requisite. However, it is important that the training provided is such that the FMP and/or supervisor of the ATFMU are able to fully understand and discuss ATC operations so that the expected outcomes can be achieved.

Over time, the objective should be to develop the ATFMU to become an integral part of ATC so that it is seen as the manager of the airspace, ensuring the delivery of the right amount of demand in the right shape to achieve maximum capacity.

Tasks and Competencies

Main tasks for an ATFM Unit

The objective when defining the tasks of an ATFM Unit should be to ensure that the ATFMU become the focus for an effective management of airspace availability and capacity. The ATFMU should manage and coordinate actions associated with optimising demand against the capacity of the airspace, ensuring that the complexity of traffic does not exceed the capability of the control service.

The ATFMU should maintain a strategic and tactical overview of the network (airspaces and airports within and adjacent to its area of responsibility), being responsible for the development of tactical ATFM strategies, and for managing network responses to demand and capacity issues.

The main tasks of a service provided by an ATFM unit include:

- Receive and analyse all ATFM data and associated parameters;
- Plan and coordinate capacity adjustment for next day's operation;
- Plan and coordinate ATFM Daily Plan for the next day's operation;
- Manage proper execution of ATFM Measures on day of operation based on ATFM Daily Plan;
- Coordinate tactical capacity adjustment on ATM resources with the local ATC Supervisors;
- Monitor and execute ATFM Measures on day of operation as required based on ATFM Daily Plan;
- Ensure proper integration of traffic demand inputs;
- Ensure proper configuration of ATFM automation support systems;
- Ensure optimisation of resources through an efficient CDM process;
- Provide focus and specialist expertise for planning, coordinating and implementing measures for capacity management and contingency operations;
- Conduct post operations analysis of previous days ATFM operation.

Competencies for staff executing ATFM

To perform ATFM tasks, staff needs to be trained to possess a number of competencies. They need to have full knowledge of the FIR and/or airports for which the service is applied. They also need to understand the factors that impact on the capacities for the various parts of airspace and airports, and they need to be fully aware of the impact on the provision of ATC that the different actions they propose to implement may have. In order to be effective, the ATFMU needs to coordinate and cooperate closely with ATC, airports and civil and military airspace users.

The required competencies include the ability to:

- Determine an accurate picture of air traffic demand;
- Receive, verify, evaluate, enter and store all relevant ATFM data;
- Monitor the evolution of demand versus capacity identifying all shortfalls and opportunities for optimisation;
- Determine the need for ATFM measures in all phases of ATFM;
- Draw up and publish ATFM plans and any changes to the plan (understand what Information to be published);
- Create, maintain, monitor and adjust all relevant ATFM scenarios and measures;

- Ensure that AOs are provided with advice and guidance for minimising delays and disruption;
- Know and adhere to all relevant operational instructions, operations manuals and letters of agreement (actively locate, read and follow instructions).

<u>ATFMU Operational Staff Job Descriptions</u>

General

The job descriptions of staff operating an ATFM facility will depend on the chosen organization. For the purposes of this document the following job descriptions are proposed. Depending on the local organization responsibilities may be delegated or not, and functions may be combined or subdivided.

- ATFM Unit Operations Manager
- ATFM Unit Supervisor
- ATFM Unit Planner
- ATFM Unit Office (executive)
- ATFMU Support Assistant
- ATFMU CDM partner

ATFM Unit Operations Manager Job description

Each ATFM unit should have a clearly designated line manager directly responsible for the overall operation of the unit. He is the immediate hierarchical superior of the ATFMU supervisors. Although not normally involved in the direct execution of ATFM it is recommended that the Operations Manager be subject to an appropriate form of training and competency assessment.

The job description of the Operations Manager is not defined in this document as this will vary according to the organization management structure. However it is strongly recommended that the Operations Manager acquire and maintain level 2 (ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events) competence in all the subjects contained in the basic training content.

ATFMU Supervisor Staff Job Descriptions

The duties of the supervisor/manager of an ATFM service function include:

- Ensure self-briefing and that all ATFM staff are fully briefed on all aspects of the operation;
- Plan and coordinate with ATC supervisor capacity adjustment for next day’s operation;
- Plan and coordinate ATFM Daily Plan for the next day’s operation;
- In coordination with local ATC supervisor manage local and network resources to optimise capacity and minimise delays within their areas;
- Supervise the proper execution of ATFM Measures on day of operation based on ATFM Daily Plan;
- Organize, chair and conduct all necessary CDM conferences;
- Proactively use their experience and authority in an appropriate manner, be creative and use initiative in the resolution of problems that may arise using an inclusive collaborative process;
- Execute all appropriate staff management duties fairly and transparently in accordance with local procedures and processes;
- Manage disruption and contingency procedures and ensure appropriate escalation;
- Ensure ATFMU management is aware of all significant events;
- Ensure accurate log keeping and recording of all significant occurrence.

ATFMU Planner Staff Job Descriptions

The duties of the planning function of an ATFM service include:

- Manage and execute the short term strategic and pre-tactical operational processes and post operational evaluation;
- Maintain a good level of coordination with the ATC Supervisor in order to negotiate the best possible pre-tactical solutions including negotiating improved capacity, applying ATFM regulations where necessary and proposing & implementing the optimum ATFM measures for the network;
- Create and continuously adapt plans and to propose new solutions taking into consideration ever changing circumstances;
- Proactively provide all reasonable assistance to the airspace users in order to facilitate them to optimise their operations;
- Endeavour to maintain the principles of network optimisation and collaborative decision making during all ATFM processes;
- Coordinate ATFM solutions with other operational functions (tactical, AMC, Flight Planning);
- Ensure that the ATFM network plan and all changes are fully communicated with Aircraft Operators, Airports and Air Traffic Control Centres;
- Evaluate execution of the ATFM plan in order to determine lessons learnt and issues for future attention.

ATFMU Officer Job Descriptions

The duties of the ATFM Officer function of an ATFM service include:

- Execute the tactical flow management operational process from a network perspective;
- Constantly monitor traffic loads on all ATFM resources;
- Monitor any potential and actual changes in capacity (e.g. staffing, weather, airport infrastructure, etc.) and implement appropriate measures;
- Maintain a good level of co-ordination with the ACC/airport in order to negotiate the best possible tactical solutions including negotiating improved capacity, applying measures where necessary and proposing & implementing re-routing scenarios;
- Continuously adapt plans and to propose new solutions taking into consideration ever changing circumstances;
- Proactively provide all reasonable assistance to the airspace users and air navigation service providers in order to allow them to optimize their operations;
- Endeavour to maintain the principles of network optimization and collaborative decision making during all relevant ATFCM processes;
- Coordinate tactical capacity adjustment on ATM resources;
- Ensure the promulgation of all measures taken.

ATFMU Support Assistant Job Description

The duties of the ATFM Support Assistant function of an ATFM service include:

- Coordination with external clients (airspace users, ATS units, military) under the supervision of planning and executive staff;
- Reception, validation and input of ATFM data;
- Ensure proper integration of traffic demand inputs;

- Maintenance of operational documentation;
- Responding to routine queries from external clients, providing standard information and referring issues to planner and officer where appropriate.

Note: The duties of the Support Assistant function will depend on which executive position the support function is assigned to. It is suggested that the same basic training curriculum is followed for support and executive staff, but that the level of knowledge and competency required be at a lower level.

CDM partner Job Description

The duties of CDM partners are not defined in this document. It is suggested that the training authority selects the appropriate subject and competency levels for each CDM partner group based on the detailed training requirements below.

Ab initio ATFM training

Ab-initio training is intended to ensure that new ATFM staff possesses the necessary contextual knowledge in order to follow the more detailed job related training. In many cases staff may already possess this knowledge (e.g. ATC staff will possess the necessary ATC knowledge, Airline operations personnel the necessary aircraft operations knowledge).

Basic Requirements

The possession of the necessary ab-initio subject knowledge should be assessed upon recruitment / assignment. In cases where staff possess the necessary contextual knowledge these staff may be exempted in whole or part from elements of ab-initio training.

There are several basic requirements or pre-requisites for the successful conduct of ATFM training. These include:

- Pre-requisite skills and experience (e.g. experience in ATM, aircraft, airport operations)
- Complementary skills (IT skills, written and oral communication skills, operations analysis, statistics experience)
- Medical requirements
- Language requirements

Normally these competences and requirements form part of the recruitment requirements. The definition of these general requirements is beyond the scope of this document. However, material is readily available in the public domain from other ATM related functions that can assist those responsible for recruitment and training to draw up appropriate general competency and experience requirements.

ATFM Ab-initio training content

The subjects contained in the modules below need to be covered in the Ab-Initio Training phase. It is recommended that the appropriate taxonomy level for ab-initio training is between level 1 (basic knowledge) and 2 (understand and discuss).

> **Level 1:** A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.
>
> **Level 2:** The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

ATFM as described by ICAO is a collaborative process between ATC and the Airspace User facilitated by the ATFM units. Airport operations authorities are also an essential ATFM partner. It is therefore suggested that these partners should be closely associated with the training content development and delivery. The ab-initio training should include facilitated visits of the operations units of these stakeholders.

The modules that need to be covered during the Ab-Initio Training Phase can be found at Attachment A to this guidance.

Basic ATFM Training

Basic training is the main phase where the core ATFM and associated operational topics are covered in a comprehensive fashion. At the successful completion of the class room training part of the basic training the staff member should be fully prepared to begin his/her period of OJT in the pre-tactical and/or tactical area. He/she should have achieved all the relevant knowledge and skills and be able to understand the concept of ATFM, the operating procedures in place and the use of related equipment. The start of the training should be preceded by an information session providing the training aims and the overall planning for the entire training. As part of the informative session, trainees would be informed about the design of the training modules, and their expected involvement during the training. Depending on the background of the trainees, it may be beneficial to consider involving the participants in a workshop style environment, encouraging them to develop their own ideas and to motivate them into thinking how the role of the ATFMU can be developed to support the overall objectives of the ATFMU.

The following modules need to be covered during the Basic Training phase:

1. Foundational objectives and principles of ATFM
2. ATFM Institutional and Regulatory background
3. The CDM Process in the context of ATFM
4. ATM Planning
5. ATFM Phases
6. ATFM Demand
7. ATFM Measures (Traffic Management Initiatives)
8. ATFM Contingency Procedures
9. ATFM Data and Tools

This document does not provide a detailed curriculum for ATFM training since this has to be individually prepared based on the pre-requisites for that particular training course. When deciding on training content for a specific Basic Training course, it is important to consider:

- the position that the trainees are going to be trained for, i.e. the job responsibilities;
- the competencies required to carry out the tasks; and
- the background of the trainees, i.e. the competency level.

Based on those three criteria and the training requirements they indicate, the content of the modules described at Attachment B to this guidance can be adapted to fit the needs of a specific course. At Attachment C is a description of how one State (Japan) has organized its training for ATFM positions. The attachment includes a sheet where the details of what needs to be covered during the OJT period is listed, items against which the trainee has to demonstrate an acceptable level of knowledge and understanding.

APPENDIX J – ATTACHMENT A: Modules to be covered during the Ab-Initio training phase

Aviation Law and Institutional Background

Phase	Ab-Initio	
Subject	Aviation Law and Institutional Background	
Objective	**Understand** national and international regulatory context of ATM in general and ATFM.	
Content		Reference Documents
• International Aviation Structure and Organization		Chicago Convention, Annex 11, Local legislation and role, Doc 4444, Doc 9971
• National Aviation Structure		
• National Aviation regulations		
• Structure on ANS and ATS		
• Institutional international and national background of ATFM		
• Safety Management Principles		

Air Traffic Management

Phase	Ab-Initio	
Subject	Air Traffic Management	
Objective	Learners shall **understand** the basic principles of Air Traffic Management and be able to **discuss** basic operational procedures.	
Content		Reference Documents
• Air Traffic Control Service (Aerodrome, Approach, En-route, Oceanic)		Annex 11, Doc 4444, Doc 9971, Doc 7030, ATFM Manuals introduction Local ASM rules Annex 2, Doc 7910 local rules
• Flight Information Service and Advisory service		
• Alerting Service		
• Structure on ANS and ATS		
• ATFM Introduction		
• Airspace Management		
• Altimetry and Level allocation		
• Separations		
• ATM Data o ICAO designators o Other designators		
• Flight Plan processing		

Air Traffic Flow Management

Phase	Ab-Initio	
Subject	Air Traffic Flow Management	
Objective	Learners shall **understand** the basic principles and origin of air traffic flow management and be able to **discuss** basic operational procedures.	
Content		Reference Documents
• Objectives of ATFM		Doc 9971
• Benefits of ATFM		
• Principles of ATFM		

Aircraft and Flight Efficiency

Phase	Ab-Initio
Subject	Aircraft

Objective	Learners shall **understand** the basic principles of the theory of flight and aircraft characteristics and how these influence ATS and ATFM operations.

Content	Reference Documents
• Principles of flight	Local airline SOP Doc 4444, EUROCONTROL ERNIP (flight efficiency section)
• Aircraft Engines	
• Aircraft Systems and Instruments	
• Aircraft categories	
• Factors affecting aircraft performance	
• Aircraft performance data	
• Flight efficiency concepts (economic, environmental)	

ATM Equipment and Systems

Phase	Ab-Initio
Subject	ATM Equipment and Systems
Objective	Learners shall **understand** the basic working principles of equipment that is in general use in ATC;

Content	Reference Documents
• Radio communications	Local ATM System Manuals
• Radar, Primary, secondary, mode S, CPDLC	
• ADS	
• AFTN, AIDC/OLDI,	
• AMAN, DMAN, ASMGS	

Airport Operations

Phase	Ab-Initio
Subject	Airport Operations
Objective	Learners shall understand the operations related functions carried out at airports.

Content	Reference Documents
• Aerodrome infrastructure	IATA Slot allocation guidelines Local Airport documentation
• Airport capacity	
• Airport scheduling, coordination. Airport slot allocation	
• Management of maintenance	
• Management of disruptive events	

Airline Operations

Phase	Ab-Initio
Subject	Airline Operations
Objective	Learners shall understand the ATM operations related functions carried out by aircraft operators.

Content	Reference Documents
• Airspace Users operating models (hub, point to point, major carriers, low fare sector…)	Local Airline Operations Manuals
• The airlines operations Centre	
• Airspace Users (scheduled, non-scheduled, business, general aviation, military)	

ATFM and CDM

Phase	Ab-Initio
Subject	ATFM and CDM

Objective	Learners shall **understand** the fundamental CDM concepts underlying effective ATFM	
Content		Reference Documents
• ATC v ATFM		Doc 9971
• ATFM; bridging the gap between ATC and airline operations		
• CDM competencies		
• CDM skills		

Meteorology

Phase	Ab-Initio	
Subject	Meteorology	
Objective	Learners shall **understand** how meteorology affects ATS operations and aircraft performance and limits ATFM capacity.	
Content		Reference Documents
• Basic introduction to meteorological phenomena		Local MET Manuals
• Aviation meteorological forecasts and observations		
• Understand the meteorological hazards to aviation		
• Weather and capacity		

APPENDIX J – ATTACHMENT B: Modules to be covered during the Basic Training phase

Foundational objectives and principles of ATFM

Phase	Basic
Subject	Foundational objectives and principles of ATFM
Objective	• understand the philosophy of air traffic flow management, including the objectives and principles of ATFM; • know how the ATFM service operates; • know the terms and definitions used; • know the structure and organization of the ATFM service function, including the roles and responsibilities of the stakeholders in the ATFM service; • understand the training requirements for stakeholders in the ATFM service.

Content	Reference Documents
• Objectives and principles • Benefits of ATFM • How the ATFM service operates • Systems, processes and operational data that supports the application of ATFM • Basics of a CDM process • Link to ASM, Civ/Mil coordination • Organizational structure • Roles and responsibilities	• ICAO Doc 4444, • ICAO Doc 9971, • Local ATFM doc.

Role	**Operations management**	**Supervision**	**Planner**	**Execution**	**Support**	**CDM partner**
Level	2	5	5	4	3	2

ATFM Institutional and Regulatory Background

Phase	Basic
Subject	ATFM Institutional and Regulatory background
Objective	• know the regulatory background, both global and local, for the application of an ATFM service.

Content	Reference Documents
• ICAO standards and recommended practices (Annex 11, Annex 15) • ICAO procedures (Doc 4444, doc 7030) • Local rules and procedures (AIP, Letters of Agreement, local procedures, Start-up procedures, departure sequence)	• ICAO Annex 11 and 15 • Doc 4444 • AIP and other local documentation

Role	**Operations management**	**Supervision**	**Planner**	**Execution**	**Support**	**CDM partner**
Level	2	5	5	4	3	2

The CDM Process in the context of ATFM

Phase	Basic
Subject	The CDM Process in the context of ATFM
Objective	• Full knowledge of the process to communicate and exchange operational information among stakeholders on a real-time basis. • Understanding of how the CDM process allow decisions to be taken to best meet the operational requirements of all concerned.

Content	Reference Documents
• CDM organization and structure o Support to ATFM stakeholders • Means of communication o Communications in tactical operations; e-conf, tele-conf etc. • Stakeholder roles and responsibilities • understanding of the interaction with other stakeholders at the various stages of the process o ATFM Operations and airports o ATFM Operations and aircraft operations o ATFM Operations and meteorology • CDM requirements and benefits • Link to A-CDM	• Doc 4444 • Doc 9971 • Local ATFM documentation

Role	**Operations management**	**Supervision**	**Planner**	**Execution**	**Support**	**CDM partner**
Level	2	5	5	4	3	2

ATM Planning

Phase	Basic
Subject	ATM Planning
Objective	• understand the process to optimize available capacity, and how to use other available capacities; • be aware of factors impacting capacity.

Content	Reference Documents
• ATM Planning o Quantify imbalance between demand and capacity o How to address the imbalance at the strategic phase • Capacity assessment models o Monitoring values o Intervention values • ATC Capacity • Staffing schedules and opening schemes of the component ATC Units • Capacity optimisation • Factors reducing capacity • Coordination with ASM	• ICAO Doc 4444 • ICAO Doc 9971 • Local ATFM doc

Role	**Operations management**	**Supervision**	**Planner**	**Execution**	**Support**	**CDM partner**
Level	2	5	5	4	3	2

ATFM Phases

Phase	Basic
Subject	ATFM Phases
Objective	understand the main principles for how the ATFM processes are applied during the different phases in order to balance demand and capacity within a given area.

Content	Reference Documents
• Strategic Phase o Strategic to pre-tactical • Pre-tactical Phase o Pre-tactical processes o Building a pre-tactical plan o The concept of a rolling plan o Airport role during pre-tactical o Aircraft operator role during pre-tactical o Special events planning o Slot allocation process, incl. principles, computer assisted or manual allocation process, and change process • Tactical Phase o Re-routing flights o Manual actions on a flight o Tactical management of the daily plan • Post-Ops o Requirements for a good post-ops analysis o Feedback and evaluation o Operational feedback o Incident reporting	• Doc 4444 • Doc 9971 • Local ATFM documentation

Role	**Operations management**	**Supervision**	**Planner**	**Execution**	**Support**	**CDM partner**
Level	2	5	5	4	3	2

ATFM Demand

Phase	Basic
Subject	ATFM Demand
Objective	• know the process of organizing demand into traffic volumes based on particular reference locations; understand the configurations used and the establishment of pre-defined scenarios; • understand how traffic demand, the tactical traffic situation and met forecasts can be used to optimise capacity; and • understand issues related to occupancy.

Content	Reference Documents

• Establishing demand o Establishing demand for a sector/airport o Establishing demand along predefined major traffic flows • Determining Traffic Volumes based on defined demand o Determine reference locations o Occupancy counts/duration o Define major traffic flows in a traffic volume • Implementation and management of pre-defined scenarios • Set up and run simulations • Forecasts • Schedules and flight plans, including missing flight plans • Airport slots • Flight positions	• Local ATFM doc

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	4	5	4	3	2

ATFM Measures

Phase	Basic
Subject	ATFM Measures (Traffic management Initiatives)
Objective	• know the different measures available and how to apply them in the ATFM service; • understand the role of the stakeholders in the process
Content	Reference Documents
• Apply, modify and cancel ATFM measures • Capacity Optimisation measures (sector/airport management, complexity reduction) • Demand distribution measures (routing scenarios, level capping, advancing traffic, balancing arrivals/departures, Ground delay) • Demand regulation/reduction measures(Airborne delay/holding, minimum departure intervals, miles in trail, policy, out of area traffic, adherence) • Exemptions and exclusions (compliance monitoring, reporting) • Slot adherence • Slot swapping and slot extensions, policy • Delay causes and attribution • Use tools to support the processes • Compliance monitoring	• Doc 4444 • Doc 9971 • Local ATFM doc

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	5	5	4	3	2

ATFM Contingency procedures

<table>
<tr><td>Phase</td><td colspan="6">Basic</td></tr>
<tr><td>Subject</td><td colspan="6">ATFM Contingency procedures</td></tr>
<tr><td>Objective</td><td colspan="6">Full understanding of procedures to be applied in the case of a contingency.</td></tr>
<tr><td colspan="4">Content</td><td colspan="3">Reference Documents</td></tr>
<tr><td colspan="4">• Contingency procedures
o Management of industrial actions
o Non-availability of airspace/airports
• Adverse weather situations
o Convective weather
o Low visibility
o De-icing conditions</td><td colspan="3">• Local ATFM documentation</td></tr>
<tr><td>Role</td><td>Operations management</td><td>Supervision</td><td>Planner</td><td>Execution</td><td>Support</td><td>CDM partner</td></tr>
<tr><td>Level</td><td>2</td><td>5</td><td>5</td><td>4</td><td>3</td><td>2</td></tr>
</table>

ATFM data and tools

<table>
<tr><td>Phase</td><td colspan="6">Basic</td></tr>
<tr><td>Subject</td><td colspan="6">ATFM Data and Tools</td></tr>
<tr><td>Objective</td><td colspan="6">• ensure full knowledge of the function and use of tools providing support to the application of ATFM; and
• understanding of the need for sharing of data.</td></tr>
<tr><td colspan="4">Content</td><td colspan="3">Reference Documents</td></tr>
<tr><td colspan="4">• ATFM Support tools
o Main functionalities of tools used
o Pre-tactical tools used
o Building a plan in a pre-tactical tool
• Environmental data in ATFM support tools
o Static, semi-static and dynamic data
• Flight data in ATFM support tools
o Traffic load monitoring (types of traffic counts)
o Flight activation monitoring
o Data exchange and sharing</td><td colspan="3">• ICAO Doc 9971
• Local ATFM documentation</td></tr>
<tr><td>Role</td><td>Operations management</td><td>Supervision</td><td>Planner</td><td>Execution</td><td>Support</td><td>CDM partner</td></tr>
<tr><td>Level</td><td>2</td><td>4</td><td>5</td><td>4</td><td>3</td><td>1</td></tr>
</table>

APPENDIX J – ATTACHMENT C: ATFM Training for ATM Officers in Japan

The Air Traffic Management Center (ATMC), is the organization of Japan Civil Aviation Bureau (JCAB) providing ATFM services to the aircraft flying Fukuoka FIR. As soon as transferring into ATMC, a rookie ATM officer starts initial training for an assistant position. The training course includes, but are not limited to:

- Concept of Air Traffic Management
- Organizational structure and regulatory bases of ATMC
- Outline of ATM services (i.e. ASM, ATFM, Oceanic ATM, and CDM)
- Knowledge and understanding of the present ATM environment (i.e. FIRs, Sectors of ACCs, TMAs, ATS routes, Training/Restricted areas, Navigational aids, Operations and performances of aircraft, Information processing system/tool/network related to ATM services, Communication procedures, etc.)

The special training for ATFM positions is scheduled following the above-mentioned initial training. The ATFM training consists of two parts. The first part is classroom lectures and practical simulator trainings. The second part is on-the-job trainings.

The ATFM training starts from the classroom lectures and practical simulator trainings, which are typically programmed as follows:

Day 1: ATFM system and other associated equipment (management and coordination procedures of standard routes and alternative routes)

Day 2: Capacity value calculation procedures (weather and ATFM)

Day 3: Monitoring and prediction of traffic volume (flow control procedures)

Day 4: Algorithm of Expected Departure Clearance Time (EDCT) calculation (handling procedures related to diversions at major airports)

Day 5: Cross border ATFM (characteristics of traffic flow and ATC operating procedures in ACC sectors)

Day 6: Specifications of airports/aerodromes and ATC operating procedure (ATM operations plan (OP) and CDM) (simulator: extracting relevant information/lists, setting capacities)

Day 7: Regulations and agreements on ATFM (simulator: flow management of ACC sectors)

Day 8: In-house operating procedures (simulator: flow management of RJTT/RJAA)

Day 9: Recently introduced/amended procedures (simulator: flow management of international ATS routes)

Day 10: Case studies (final checks).

The on-the-job training (OJT) is phased and standardized. The trainee and the training supervisors are supposed to use “OJT check sheet” so that the trainee can master a required skill for ATFM services systematically. The check sheet used in Japan is described below:

OJT check sheet			Phase A B C	Month			Starting date of the phase A				B				C		
ATFM			Crew Graduating Class Name	Number of mark "4" earned by previous month	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV	Date Hour SV
phase				4	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13
			Monitoring traffic volume														
A			able to manipulate FMW and display necessary information timely														
A			able to calculate workload value of sectors per aircraft														
A			able to extract relevant departure flight plans for flow control initiatives														
A			able to evaluate EDCT flow controls before starting/ending the initiatives														
	B		able to evaluate EDCT flow controls including a ground stop														
	B		able to evaluate flow controls thru assignment of departure intervals														
	B		able to evaluate flow controls thru assignment of inflow intervals														
	B		able to except particular aircraft from flow controls or demand tallying process before/during initiatives														
	B		able to monitor airports/sectors with traffic flow characteristics taken into account														
	B		able to analyze flight plans correctly														
	B		checking combine/decombine status of sectors and conditions of inflight aircraft by manipulating FPVD														
	B		able to plan and input the pre-tactical operation of variable sectors														
		C	able to perceive RWY operation patterns of RJTT/RJAA and input correctly														
		C	able to input capacity values correctly in accordance with present MET conditions or RWY in use														
		C	able to change capacity values in accordance with expected scenarios														
		C	able to predict the change of traffic demand graph and cope with it when traffic is surged against prediction														
		C	able to evaluate intended flow controls with the initiatives planned in the other ATFM position taken into account														
		C	able to cope with the unexpected, such as RWY closure														

			Flow control procedures														
A			able to figure out and input FROM-TO of EDCT flow controls														
A			able to figure out and input START-END of EDCT flow controls														
	B		able to coordinate about the start of flow controls with related ATC facilities														
	B		Conveying just enough information (i.e. flow controlled area, measure, start time, end time, FROM-TO, max demand value, capacity value) to an ATM supervisor before starting initiatives timely														
	B		able to make flow controls on inflight aircraft (i.e. assigning inflow intervals, specifying airspeed/altitude/route, assigning airborne holding)														
	B		able to make flow controls on departures by assigning departure intervals														
	B		able to figure out appropriate FROM-TO of flow controls on airports														
	B		able to figure out appropriate FROM-TO of flow controls on sectors														
	B		able to figure out appropriate FROM-TO of flow controls on ATS routes														
	B		able to adjust EDCT appropriately as needed														
	B		balancing the amount of delay of EDCT and arising no reverse in departure sequence in the respective airports														
	B		able to evaluate and decide the end time of flow controls appropriately														
	B		able to coordinate about the end of flow controls with related ATC facilities														
	B		able to cope with the change in ending time of flow controls (including input timing of "TO")														
	B		able to cope with EDCT exceeding the ending time of flow controls														
		C	able to cope with reversed departure sequence arisen by the capacity change during EDCT flow controls														
		C	able to make flow controls on departures by using the ground stop feature														
		C	able to conduct time frame coordination														
		C	able to make a judgement on whether ongoing ATC restrictions should be changed to ATFM initiatives, and able to cope with the change														

[Marks] 1: incapable/unknowing 2: lack of skill/understanding 3: barely able 4: able 5: well enough
The mark "4" indicates 70-80%, and "5" indicates beyond 80%, which are acceptable level.
When marking "5", the training supervisors should fill in own initials to the right colomn. The "5" marked training items will be exempted in the subsequent OJT
The training items rarely happen can be substituted by oral tests in the OJT. The mark through oral tests shall be expressed by an encircled number.

Acquiring "4" three times or more, or acquiring "5" can complete the training item. After completing all the training items of the phase, the OJT moves on to the next phase

[Abbreviations] FMW: Flow Management Workstation, EDCT: Expected Departure Clearance Time, FPVD: Flow Plan View Display
CCW: Traffic Control Condition Supervised Workstation, SSW: Strategic Statistics Workstation, SAW: Statistic Analysis Management Workstation

ATFM																	
phase				4	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13
			Cross Border ATFM														
A			able to extract aircraft groups bound for particular destination via particular ATS route														
	B		able to adequately communicate with foreign ANSPs														
	B		able to make a judgement on whether the ATFM initiatives are consistent with the stipulations of LOA (i.e. flow controlled airport, reason, lead time for coordination, measure)														
	B		able to coordinate with related ATC facilities about the flow controls on G585 (SAPRA) requested from Incheon ACC														
	B		able to coordinate with related ATC facilities about the flow controls requested from Taipei ACC														
		C	able to cope with the unexpected or any change in ATFM initiatives requested by foreign ANSPs														
			Operating procedures for handling diversions														
A			able to notify facilities concerned without omission in accordance with the phase of diversions														
A			able to input start/end to CCW														
A			able to display number of spots available all day in the phase 1														
	B		able to allocate airports for diversion appropriately in response to requests														
	B		able to manage the case when aircraft request diversion to RJOO														
	B		able to manage the case when the width or length of diverting aircraft is unclear (including A346, B777, B773, B77W, etc)														
	B		able to manage the case when aircraft request diversion to RJTY or RODN														
		C	able to manage the case when aircraft request diversion to airports not registered in CCW														
		C	able to manipulate CCW when aircraft canceled diversion														
		C	able to make a judgement and coordination about ending respective phases of diversion														

			Acquiring/providing adequate information														
A			able to extract necessary NOTAMs quickly														
A			able to display MET data of particular airports														
	B		Keeping good watch on the situations being faced in the other ATFM positions														
	B		able to get information about restricted areas, training/testing areas, etc.														
		C	able to make flow controls on inflight aircraft (i.e. assigning inflow intervals, specifying airspeed/altitude/route, assigning airborne holding)														
			Handling SAW/SSW														
	B		able to manipulate SSW and get daily statistical information														
		C	able to make coordination with AO thru SSW about flight planned routes for the next day														
		C	able to confirm and input the information about the cancellation of a flight thru SSW														
			Miscellaneous														
	B		able to take over the ongoing ATFM services accurately														
		C	able to handle rarely happened situations														

[Marks] 1: incapable/unknowing 2: lack of skill/understanding 3: barely able 4: able 5: well enough
The mark "4" indicates 70-80%, and "5" indicates beyond 80%, which are acceptable level.
When marking "5", the training supervisors should fill in own initials to the right colomn. The "5" marked training items will be exempted in the subsequent OJT
The training items rarely happen can be substituted by oral tests in the OJT. The mark through oral tests shall be expressed by an encircled number.

Acquiring "4" three times or more, or acquiring "5" can complete the training item. After completing all the training items of the phase, the OJT moves on to the next phase

[Abbreviations] FMW: Flow Management Workstation, EDCT: Expected Departure Clearance Time, FPVD: Flow Plan View Display
CCW: Traffic Control Condition Supervised Workstation, SSW: Strategic Statistics Workstation, SAW: Statistic Analysis Management Workstation

APPENDIX K - Collaborative ATFM Principles

General Principles

1. Increased capacity is the primary and central method for management of increasing demand.

2. FIR boundaries should not limit the delivery of ATFM messages and the coordination and application of ATFM measures.

3. Collaborative Decision-Making (CDM) to achieve optimum ATFM network outcomes while taking into account stakeholder goals.

4. An emphasis on delivery of ATFM services based where practicable on CNS capability, resulting in flexible, dynamic systems delivering optimal ATFM network outcomes while providing equity of access.

5. Regional distributed multi-nodal network model of inter-connected sub-regional ATFM networks or State ATFM systems, based on system-wide CDM, serving the busiest terminal airspace and major sub-Regional traffic flows.

6. Harmonized regional ATFM rules and guidelines based on the ICAO Manual on Collaborative Air Traffic Flow Management (Doc 9971).

People: Aviation Regulations, Standards and Procedures

7. Regionally harmonized methodology for the continuous monitoring and declaration of airport and airspace demand and capacity, the dynamic updating and sharing of capacity information, and for daily post-operations analysis.

8. Prioritization of ATFM implementation for high density airports and the busiest city pairs and FIRs.

9. Demand and Capacity inputs from automated data feeds including ATM automation systems, ATN/AFTN, and from FMPs and FOCs using web-based manual ATFM interfaces.

10. The minimum necessary ATFM Measures applied, for the shortest necessary time period and only to operations at or in capacity constrained airports or airspace.

11. Pre-tactical and tactical coordination of airport and airspace capacity constraints and proposed ATFM programs and measures with all affected Stakeholder organizations, before the independent execution of the program or measure in the ATFM system of the responsible ANSP.

12. Participation by at least 70% of aircraft operating in or to the constrained resource.

13. Aircraft operator options for delay absorption through the flexible distribution of total ATFM measure delay per aircraft to gate hold, surface hold and/or airborne delay.

14. Except in the case of flexible aircraft operator options for absorption of delay, separate ATFM measures should not be cumulatively applied to a flight.

15. Harmonized ATFM, runway sequencing (AMAN/DMAN) and A-CDM processes using common reference points and information exchange.

16. Exemption from ATFM measures of emergency, humanitarian, declared medical evacuation, search and rescue, and Head-of-State flights, and other flights as determined by the State authority.

17. Direct coordination between aircraft operator and airport operator to determine maximum gate delay and surface delay.

18. Direct input of delay absorption intent into the ATFM system by aircraft operators.

19. Pilot-in-command responsibility for adherence to operational procedure for requesting speed, route or level changes where flexible delay option is exercised.

20. Continuous monitoring of compliance with ATFM measures, supported by procedures for the real-time and post-operational management of non-compliance.

21. Bi-lateral or multilateral agreements where necessary to support common business rules for departure, destination and en-route ANSPs and airport operators.

22. Development of manual processes and skills to promote practical knowledge and understanding of ATFM before implementing technology based solutions, and as a contingency response capability.

23. The use of high-fidelity simulators to train controllers and ATFM personnel in ATFM procedures and techniques.

ATM Coordination

24. The prioritization of integrated AIDC/OLDI systems for timely ATM and ATFM system updates of trajectory data, including preferred implementation of advanced AIDC/OLDI messaging and configuration of systems for early delivery of AIDC/OLDI messages.

Facilities: Aerodromes

25. Encouragement for aerodrome operators to actively participate in ATM coordination in respect of A-CDM development and operational planning, including aerodrome complexity and capacity.

ATFM Systems

26. Collaboration by ANSPs for evaluation and planning of harmonized ATFM facilities.

27. Optimization of ATFM facilities through automated, networked, central flow management centres and units or equivalent virtual platforms.

28. Independent FMP/ATFM systems operated by each ANSP, connected to the sub-regional or regional ATFM network.

29. Continuous supervision, operation, adjustment, monitoring and executive control of ATFM systems and their output by dedicated ATFM or designated ATC personnel.

30. ATFM communications via existing internet/telecommunications networks.

31. Preference for relevant ATFM data and notifications from each ANSP, including slot assignments, distributed to stakeholders via web interfaces.

32. Collaborative development of A-CDM, ATFM, AMAN and DMAN capability.

33. Encourage the real-time sharing of dynamic air traffic data relating to flights operating or intending to operate in civil-controlled airspace, between military ATM systems and civil ATM/ATFM systems.

ATM Modernization Projects

34. Inter-regional and sub-regional cooperation ('clustering') for the research, development and implementation of ATFM projects.

APPENDIX L - CDM/ATFM Trial Tiered Participation Levels

Air Navigation Service Providers

Note: Outside ATFM Ops Trial ANSPs may already have been asked to support ATFM Operations through Minimum Departure Intervals between flights or providing longitudinal separation between flights such as Miles-in-Trial or Minutes-in-Trail

Level 1 – Observe Trial

- Participate in CDM/ATFM Meetings
- Participate in Operational Trial Planning process

Level 2 – Facilitate CTOT for Departures (includes Level 1)

- Receive CTOT for departure to other Demand-Capacity imbalance airports
- Facilitate airline operator CTOT compliance for departing flights

Level 3 – Demand-Capacity Balancing Capability (includes Levels 1 and 2)

- Evaluate Traffic Demand
- Evaluate and update Airport Acceptance Rate (AAR)
- Distribute CTOT to airline operators and ANSPs

Aircraft Operators

Level 1 – Participate in the Trial

- Receive CTOT for departure to other Demand-Capacity imbalance airports
- Manage flight operations and coordinate with ATCs and Airport Operators to achieve CTOT compliance for departures
- Participate in the ATFM / CDM Operational Trial Project and Focus Group meetings
- Participate in the Operational Trial planning process

Level 2 – Slot Swapping and CTOT User Inputs (includes Level 1)

- Optimize flight operations through slot swapping and CDM process
- Provide CTOT User to ATFM portal (advanced Operational Trial – later phase)
- Evaluate and update on outcomes of ATFM measures
- Refine CDM process for optimized flight operations

APPENDIX M - ATFM Daily Plan Sample Template

ATFM Daily Plan	**[Name of ATFM Unit]**		**[UTC DATE] [APPLICABLE TIME]**
CAPACITY and CONSTRAINTS			
Location (AD or SECT)	**Applicable Period**	**AAR (landings per hour)**	**CONSTRAINT/REMARK**
ATFM MEASURES			
Location (AD or SECT)	**Applicable Period**	**MEASURE REMARKS**	
POSSIBLE/DEVELOPING ISSUES			
Location (AD or SECT)	**Applicable Period**	**MEASURE REMARKS**	

EXAMPLE ATFM DAILY PLAN:

<table>
<tr><th>ATFM Daily Plan</th><td colspan="2">RJJJ</td><td>1504022000-1504031959</td></tr>
<tr><th colspan="4">CAPACITY and CONSTRAINTS</th></tr>
<tr><th>Location
(AD or SECT)</th><th>Applicable Period</th><th>AAR
(landings per hour)</th><th>CONSTRAINT/REMARK</th></tr>
<tr><td>RJCC</td><td>2100-2300</td><td>04-06</td><td>LVP</td></tr>
<tr><td>RJTT</td><td>0200-0300</td><td>10</td><td>RWY34L/16R CLSD 0200 – 0245 CONST</td></tr>
<tr><td>RJTT</td><td>0300-0500</td><td>14</td><td>FLTCK RWY22 ILS</td></tr>
<tr><td>SECT 1</td><td>0130-UFN</td><td>-</td><td>Developing CB</td></tr>
<tr><th colspan="4">ATFM MEASURES</th></tr>
<tr><th>Location
(AD or SECT)</th><th>Applicable Period</th><th colspan="2">MEASURE REMARKS</th></tr>
<tr><td>RJTT</td><td>2330-0140</td><td colspan="2">CTOT DEST RJCC</td></tr>
<tr><td>SECT 12</td><td>2300-0005</td><td colspan="2">3 MINIT DEP RJAA/RJTT</td></tr>
<tr><td>SECT 12</td><td>0130-UFN</td><td colspan="2">G585 8 MINIT AT [WAYPOINT] WB FOR ZMUB REGARDLESS OF FL</td></tr>
<tr><th colspan="4">POSSIBLE/DEVELOPING ISSUES</th></tr>
<tr><th>Location
(AD or SECT)</th><th>Applicable Period</th><th colspan="2">MEASURE REMARKS</th></tr>
<tr><td>RJAA</td><td>0300-0500</td><td colspan="2">15 MIT, 250KT AT [WAYPOINT] [WAYPOINT]</td></tr>
<tr><td>RJTT</td><td>0300-0500</td><td colspan="2">CTOT</td></tr>
</table>

APPENDIX N - State ATFM Capability Monitoring and Reporting Form

ATFM PERFORMANCE INDICATORS

The following indicators are based on the Performance Improvement Plan of the MID Regional Framework for Collaborative ATFM, which should be read in conjunction with this form. The information provided will be used by the relevant Regional bodies to assess individual Administration and overall regional compliance with the Framework, and may be used by Administrations to internally evaluate their implementation status.

INSTRUCTIONS

A	If your administration **is expected, or intends, to implement and distribute cross-border ATFM measures** under the terms of the Performance Improvement Plan of the Asia/Pacific Regional Framework for Collaborative ATFM: **Answer Questions 1 to 32**

B	If your Administration **is not expected to implement and distribute cross-border ATFM** as described above, answer questions 33 to 48. **Answer Questions 33 to 48**

A. Administrations Distributing ATFM Measures
Indicate whether your administration has:

1	Enacted regulations for the implementation of ATFM	0
2	Ensured the origination, distribution and processing of FPL and ATS messages in accordance with ICAO Doc 4444 PANS-ATM and the Regional Framework for Collaborative ATFM	0
3	Implemented common fixes, terminology and communications in ATFM, AMAN/DMAN and A-CDM systems	0
4	Implemented meteorological services to support ATM in the terminal area (e.g. Meteorological Service in Terminal Area - MSTA)	0
5	Established ATFM capability with appropriately trained staff and operating procedures	0
6	Implemented local procedures for ATFM operations and communication, including phraseology and terminology for ATFM Units, ATS Units, airspace users, and airport operators, drawn from ICAO Doc. 9971	0
7	Performaned an analysis of current traffic demand and expected growth for the next 5 years (rolling)	0
8	Implemented a program of bi-annual strategic airport and airspace capacity, and strategic demand analysis	0
9	Commenced daily pre-tactical airport and airspace capacity-demand analysis for ATFM Program airports and associated terminal airspace as well as enroute ATC sectors supporting the busiest Asia/Pacific city pairs	0
10	Implemented pre-tactical modelling of airport and airspace configuration and traffic demand, and the effect of ATFM measures	0
11	Implemented dynamic updating of airport and airspace capacity constraints, capacity calculations and demand information	0
12	Implemented strategic airport slot allocation at all international airports where demand significantly exceeds airport capacity	0
13	Made arrangements for relevant ATFMU to chair and/or participate in daily ATFM conferences for pre-tactical ATFM planning	0
14	Commenced daily preparation of an ATFM Daily Plan (ADP) for all ATFM Program airports and associated terminal airspace	0
15	Enabled sharing of relevant information between all stakeholders through implementation of CDM capability	0
16	Developed procedures for ATFMU, ATS Units, airspace users, and airport operators when ATFM program is active	0
17	Implemented tactical ATFM measures for flights inbound to ATFM program airports	0
18	Implemented tactical ATFM measures for flights inbound to constrained airspace	0
19	Promulgated procedures for tactical management of ATFM measures, including revision, cancellation, suspension, de-suspension, where necessary	0
20	Ensured tactical ATFM measures for are only applied during periods of constraint	0
21	Promulgated procedures to avoid subjecting individual flights to more than one tactical ATFM measure	0
22	Implemented local ATC procedures and, where available, CDM processes facilitating compliance with received CTOT	0
23	Implemented distributed multi-nodal ATFM information distribution capability	0
24	Ensured interoperability of implemented ATFM, A-CDM, AMAN, DMAN, ATM automation systems and airspace user systems, where operational interfaces exist or are planned, using FIXM.	0
25	Ensured ATFM systems take long haul flights into account in demand predictions	0
26	Ensured ATM and ATFM systems provide timely update of estimate information for airborne aircraft	0
27	Commenced ATFM post-operations analysis and rectification, taking guidance from the Regional Framework as starting point	0
28	Developed procedures and agreements for post-operational analysis of cross-border ATFM with stakeholders	0
29	Ensured post-operations analyses are used for planning ATFM, airspace and ATS route improvements	0
30	Implemented ATS route structure improvements including CCO/CDO to reduce ATC workload and use aircraft capability to meet ATFM measures	0
31	Optimized ATC separation and reduced runway occupancy times at all ATFM program airports and in associated terminal airspace	0

B. States/Administrations Facilitating ATFM Measures (but not expected to implement and distribute cross-border ATFM) **Indicate whether your administration has:**		
32	Ensured the origination, distribution and processing of FPL and ATS messages in accordance with ICAO Doc 4444 PANS-ATM and the Regional Framework for Collaborative ATFM	0
33	Implemented local procedure with regards to ATFM operations and communication, including phraseologies, among ATFMU, ATS Units, airspace users, and airport operators	0
34	Educated ATM staff and stakeholders on the basic of ATFM and its connection with ATS	0
35	Made arrangements for relevant personnel from ATSU to participate in daily ATFM conferences for pre-tactical ATFM planning	0
36	Enabled sharing of relevant information between all stakeholders through implementation of CDM capability	0
37	Developed procedures for ATS units, airspace users, and airport operators when ATFM program is active	0
38	Developed procedures for ATS units, airspace users, and airport operators when ATFM program is active	0
39	Ensured local stakeholders are able to access CTOT information readily, either directly from the ATFMU distributing it or through local dissemination	0
40	Ensured ATM systems provide timely update of estimate information for airborne aircraft	0
41	Developed ATFM post-operations analysis workflow among ATFMU, ATS units, airspace users, and airport operators to ensure proper and timely feedback mechanism can be distributed to ATFMU originating the ATFM measures	0
42	Developed procedures and agreements for post-operational analysis of cross-border ATFM with stakeholders	0
43	Ensured post-operations analyses are used for planning ATFM, airspace, and ATS route improvements	0
44	Implemented ATS route structure improvements including CCO/CDO to reduce ATC workload and use aircraft capability to meet ATFM measures	0
45	Optimized ATC separation and reduced runway occupancy times at all ATFM program airports and in associated terminal airspace	0
46	Performed an analysis of current traffic demand and expected growth for the next 5 years (rolling)	0
47	Implemented a program of bi-annual strategic airport and airspace capacity, and strategic demand analysis	0

ATTACHMENT A - Guidelines for Improving Capacity

1. In order to improve the capacity of the system as a whole, it is advisable to analyse and identify the factors that may result in a reduction of airport and ATC sector capacity. Each factor has a weight in the capacity value, which varies according to the specific characteristics of the airport under study.

2. Some of the factors--not all factors are present in all systems--that may contribute to a reduction in capacity are as follows:

Longitudinal and Lateral Aircraft Separation Minima

3. Separation is established for safety reasons, both to avoid collisions and to prevent an aircraft from entering the wake turbulence of another aircraft, which is usually more critical when close to landing or during take-off, due to the low speeds applied. Runway configuration--the relative position and distance between runways--determines the interference that movements in one runway have on the other airport runways.

Procedures and Practices in Use

- Most airports are designed to serve the most common operation based on prevailing winds.
- Taxiways and parking aprons are built to serve the primary operation of the airport.
- Approach and departure procedures are designed to serve the primary operation of the airport
- Changes in the runway-in-use during traffic peaks may cause congestion.
- Changes in runways may create disadvantages for certain instrument departure or arrival procedures.

Weather conditions

4. Under adverse weather conditions (low ceiling and visibility), pilots and controllers work “more cautiously” and separations are extended, resulting in reduced capacity.

Aircraft Mix

5. Aircraft category and performance determine the time between two consecutive operations. It has been shown that the interval between the landing of a heavy aircraft and the landing of a light aircraft is much greater if the heavy aircraft lands first. This fact suggests the possibility of having an optimum sequencing of the aircraft waiting to land at a given airport. The aircraft sequencing problem is typically formulated as an issue of restricted optimisation, with a view to finding sequences that maximise the runway service ratio without excessively penalising some types of aircraft.

Typical demand (take-off and landing mix)

- Large concentrations of take-offs or landings can upset airport traffic flow.
- Delays in take-off can cause taxiway occupancy and approach problems.
- Landing sequencing may be affected by runway and taxiway configuration.

Type of operation (landing/take-off ratio)

6. The spacing between movements depends on the types of operations covered; that is, a landing performed following a take-off requires a different spacing compared to a take-off performed following another take-off. Capacity varies according to landing-to-take-off ratio. Consequently, a

single capacity indication makes no sense, in contrast with a capacity indication based on the operation mix.

Quality and performance of navigation, surveillance, and control systems

7. Reliable and precise systems allow for a reduction in aircraft spacing, thus increasing capacity. The use of decision-support software to assist the controller, for instance, to foresee the optimum sequencing for aircraft approaching a given airport, provides for safe and rational operations.

Controller and pilot performance

8. More experienced controllers and pilots make for more agile operations. A good example is the Congonhas airport, where controllers use the two runways for landings and take-offs; pilots conduct take-offs without stopping at the runway threshold (immediate take-off); pilots in slower aircraft try to maintain speeds that are consistent with those of commercial aircraft; etc.

Location and types of runway exits

9. Landing runway exits, when properly located, allow pilots to leave the landing runway towards the taxiway system as soon as they have slowed down enough. If the exit is a fast exit, that is, at an angle of less than 90º with the landing runway, there is no need to reduce speed too much, thus reducing runway occupancy time.

Environment

10. Noise can restrict operations on certain inhabited areas or fauna protection areas, generating additional restrictions to be considered when determining exit routes.

Restricted, prohibited, and dangerous areas

11. The existence of many restricted, prohibited and dangerous areas close to airports that do not apply procedures for coordination and flexible use of airspace constitutes an additional restriction to aircraft departure capacity.

12. Some of these factors may be of a temporary or permanent nature, depending on conditions. If they are considered permanent, they must be included in capacity calculations. Temporary factors, such as atmospheric conditions that can have a temporary impact on ATC sector capacity or airport operation, are managed by the ATC entity.

13. All these factors have an impact on the methodology used to determine capacity, and thus the importance of conducting a delay analysis.

14. This activity considers the available data coming from the recurrent delay monitoring process, but a more in-depth analysis of local circumstances is performed. The following is considered:

- Historical evaluation of delays;
- Actual reason(s) for delays;
- What is meant by ATC/Aerodrome delays?
- Who is involved in the capacity declaration process and is there a buy-in from all the stakeholders (the capacity declaration should reflect ATC/Aerodrome limits)?
- What are the reasons for additional traffic over and above the capacity declaration?
- How is extra traffic such as General Aviation accommodated?
- How many off-slot operations are experienced and how these are dealt with?
- Is there an (efficient) slot monitoring committee?

15. Airport delays should not be considered in isolation. Capacity at a number of airports is limited and action is required to ensure that capacity is not exceeded by demand at a particular moment on the day of operations.

16. Maximum airside capacity is not solely reliant on runway capacity. Aprons and taxiways must be capable of maintaining sufficient traffic throughput to match runway capacity. Terminal area capacity, arrivals and departures, the terminal building, ATC staff levels, and equipment should not be neglected during the capacity declaration process.

17. The demand-to-capacity ratio provides insight into the potential for delays at an airport. Together with the demand-to-capacity ratio used for defining traffic levels, medium-term annual demand data, based on airport-specific high, baseline and low forecasts for each of the selected airports are considered in this activity.

18. Some airports publish detailed demand and capacity analyses, taking into account hourly and seasonal variations, while others only publish an overall declared hourly capacity.

19. As general guidance, a plan to optimise capacity could include the following steps:

Step 1 – Establish a capacity baseline;

Step 2 – Determine future demand;

Step 3 – Determine if there will be a capacity reduction;

Step 4 – Identify all limitations that affect capacity;

Step 5 – Quantify the impact of limitations;

Step 6 – Identify possible corrective actions and best practices;

Step 7 – Identify the impact and cost of corrective actions;

Step 8 – Establish priorities; and

Step 9 – Develop the capacity improvement plan.

ATTACHMENT B - MID Region AIDC/OLDI Applicability Area

(Priority 1 and 2 for Implementation)

MID Region AIDC/OLDI Applicability Area (Priority 1 and 2 for Implementation)
As of July 2018

ACC	Adjacent ACCs						
Amman	Cairo (1)	Baghdad (2)	Damascus (2)	Jeddah (1)	Tel Aviv (2)		
Baghdad	Amman (2)	Ankara (1)	Damascus (2)	Jeddah (2)	Tehran (2)	Kuwait (1)	
Bahrain	Doha (1)	Emirates (1)	Jeddah (1)	Kuwait (1)	Riyadh (1)	Tehran (2) AFTN MSG	Dammam (2)
Beirut	Damascus (2)		Nicosia (1)				
Cairo	Amman (1)	Athena (2)	Jeddah (1)	Khartoum (1)	Nicosia (1)	Tel Aviv (2)	Tripoli (2)
Damascus	Amman (2)	Ankara (2)	Baghdad (2)	Beirut (2)	Nicosia (2)		
Doha*	Bahrain (1)	Emirates (1)	Jeddah (2)	Riyadh (2)			
Emiratis	Bahrain (1)	Doha (1)	Jeddah (1)	Muscat (1)	Tehran (2) AFTN MSG		
Jeddah	Amman (1)	Asmara (2)	Baghdad (2)	Bahrain (1)	Cairo (1)	Doha (2)	Emirates (1)
	Khartoum (1)	Kuwait (2)	Muscat (1)	Riyadh (1)		Sana'a (2)	
Riyadh	Bahrain (1)	Doha (2)	Kuwait (2)	Jeddah (1)			
Khartoum	Addis (1)	Asmara (2)	Brazzaville (2)	Cairo (1)	Entebbe (2)	Jeddah (1)	Juba (1)
	Kinshasa (2)	N'Djamena (2)	Nairobi (2)	Tripoli (2)			
Kuwait	Baghdad (1)	Bahrain (1)	Jeddah (2)	Tehran (2)			
Muscat	Emirates (1)	Jeddah (1)	Karachi (2)	Mumbai (1)	Sana'a (2)	Tehran (1)	
Sana'a	Addis Ababa (2)	Asmara (2)	Jeddah (2)	Mogadishu (2)	Mumbai (2)	Muscat (2)	
Tehran	Ankara (1)	Ashgabat (2)	Baghdad (2)	Bahrain (1)	Baku (2)	Emirates (2) AFTN MSG	Kabul (2)
	Karachi (1)	Kuwait (2)	Muscat (1)	Yerevan (2)			
Tripoli	Algiers (2)	Cairo (2)	Khartoum (2)	Malta (2)	N'Djamena (2)	Niamey (2)	Tunis (2)

(1) = Priority 1 for implementation based on the number of traffic movements and/or operational needs (green color means already implemented)

(2) = Priority 2 for implementation based on the number of traffic movements or if other solution is in place such as exchange of information via AFTN

ATTACHMENT C - Consolidated MID States Response to ICAO MID ATFM Questionnaire

Note: this report was presented in ATFM Core Team meeting - ACT/1 Summery of Discussion Appendix A.

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Sudan	UAE
ATFM Structure and Organization												
1. Does your State have a regulatory requirement for ATFM to be implemented in your Flight Information Region (FIR)?			YES	YES	NO	YES	NO	YES	NO	YES	NO	NO
2. Does your State have an operational requirement (e.g. demand exceeding capacity) for ATFM in your FIR?			YES	HECA, HEGA. HESH& ACC Sectors	NO	NO	NO	YES. Operational LoA with UAE ACC, Appendix G : Air Traffic Flow Management	YES	YES	NO	YES
3. Does your State have future plans or initiatives for ATFM in your FIR?			YES	YES. Aerodromes TFC LOAD MONITOR &AMAN	NO	NO	Waiting for regional initiatives	YES. The CONOPS has not been developed.	YES	YES	NO	YES
4. Does your State have an organizational structure including the following facilities and/or working positions? If future organizational structure is planned, please include date.	ATFM Services		NO	YES	NO	NO	NO		NO	Q4/2019	NO	YES
	ATFM Operational Manager		NO	YES	NO	NO	NO	Dec-19	NO	2019 - 2020	NO	YES
	ATFM positions located in the following	National ATFM center	NO	YES CANC	NO	NO	NO		NO	2021-2022	Not Answer	Q4 2022
		Area control center(s)	NO	YES. CHMI EUROCONTROL	NO		NO	Dec-19	NO	Q4/2019	NO	YES
		Approach control(s)	NO	NO	NO	NO	NO		NO	Q1/2020	NO	NO
		Control tower(s)	NO	NOPs EUROCONTROL	NO	NO	NO		NO	Q1/2020	NO	NO

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Sudan	UAE
ATFM Structure and Organization												
5. If there is existing ATFM functions performed, are there dedicated resources for these ATFM functions/positions or are these functions provided by another operational position? If provided by another operational position, please identify in the comments section.	Dedicated resource		NA		NO	Not answered	NO			Currently, there is no dedicated resources for ATFM	Not Answered	Flow Operator (Departure)
	Another Operational Position		NA	Delegated to ATC units	NO	Not answered	Receive CTOT from NM for traffic departing to EUR	Muscat ACC Planner controller			Not Answered	
6. Does your State have Letters of Agreement (LOA) that include ATFM with any of the following stakeholders? If so, please provide a copy or relevant excerpt of the LOA(s) with the survey response:	1. FIR(s)		OMAE & OEJD	NO	NO	NO	YES. Nicosia	OMAE	NO	Muscat, Bahrain, Cairo, Jordan, Khartoum, Sanaa and Doha Center	NO	YES. OOMM, OBBB, OEJD
	2. Stakeholders	- Airport Operators	NO	NO	NO	NO	NO		NO	Jeddah Airport within hajj season	NO	NO
		- Aircraft Operators	NO	NO	NO	NO	NO		NO	NO	NO	NO
		- Military	NO	YES. MIL reservation	NO	NO	NO		NO	AirForce within hajj season	NO	NO
		- General Aviation	NO	NO	NO	NO	NO		NO	NO	NO	NO
		- ATFM Units	NO	YES.	NO	NO	NO		NO	NO	NO	NO
		- National ATFM center	NO	NO	NO	NO	NO		NO	NO	NO	NO
		- Area control center	NO	NO	NO	NO	NO		NO	Q4/2019	NO	NO
		- Approach control	YES- DOHA	NO	NO	NO	NO		NO	Q1/2020	NO	YES. OMDB, OMAA, OMRK, OMFJ
		- Control tower	NO	NO	NO	NO	NO		NO	Q1/2020	NO	NO
		Comments						Operational LoA with UAE ACC, Appendix G : Air Traffic Flow				
7. Does your State have existing CDM procedures (planned or Ad-Hoc Teleconferences,) and/or tools with the following stakeholders? If future CDM procedures and/or tools are planned, please add the date.	Airport Operators		YES		NO	YES. Close coordiantion by system	NO	Oman airports by 2020	NO	NO	NO	NO
	Aircraft Operators		NO		NO		NO		NO	NO	NO	YES. UAE, ETD, FDB, ABY
	Military		NO		NO		NO		NO	NO	NO	NO
	General Aviation		NO		NO		NO		NO	NO	NO	NO
	Area control center		NO		NO	YES. Close coordiantion by system	NO		NO	NO	NO	Yes. OMAE
	Approach control		NO		NO		NO		NO	NO	NO	YES. OMAA, OMDB, OMRK, OMFJ
	Control tower		NO		NO		NO		NO	NO	NO	YES. OMSJ, OMRK, OMFJ
	Other ANSP ATFM Units		NO		NO		NO		NO	NO	NO	NO
	Other ANSP ATC		NO		NO		NO		NO	NO	NO	NO

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
ATFM Structure and Organization												
8. Does your State's ATFM unit(s) perform the following tasks? If future implementation planned, please add the date.	1. Create and distribute an ATFM daily plan		NA	Planned 2020	NO	NO	NO	NO	NO	2021-2022		Q4 2022
	2. Collect the following relevant information	- meteorological conditions	NA	Planned 2020	NO	NO	NO	YES	NO	Q4/2019		YES
		- capacity constraints	NA	Planned 2020	NO	NO	NO	YES	NO	Q4/2019		Q4 2022
		- equipment outages	NA	Planned 2020	NO	NO	YES	YES	NO	Q4/2019		YES
		- runway closures	NA	Planned 2020	NO	NO	YES	YES	NO	Q4/2019		YES
		- procedural issues	NA	Planned 2020	NO	NO	NO	YES	NO	Q4/2019		YES
	3. Analyze and distribute relevant information		NA	Planned 2020	NO	NO	NO	YES	NO	Q4/2019		YES
	4.Coordination procedures with stakeholders (indicate method(e.g., voice meetings, email) and frequency) in the comments section		NA	Planned 2020	NO	NO	YES. In case of special events coordination is carried out with all stakeholders	YES. Voice meetings	NO	TBD		YES
	5. Structured information dissemination process, i.e. website		NA	Planned 2020	NO	NO	Via letters/aeronautical publication	NO	NO	2019-2020		YES
		- ATFM Units	NO	YES.	NO	NO	NO		NO	NO	NO	NO
		- National ATFM center	NO	NO	NO	NO	NO		NO	NO	NO	NO
		- Area control center	NO	NO	NO	NO	NO		NO	Q4/2019	NO	NO
		- Approach control	YES- DOHA	NO	NO	NO	NO		NO	Q1/2020	NO	YES. OMDB, OMAA, OMRK, OMFJ
		- Control tower	NO	NO	NO	NO	NO		NO	Q1/2020	NO	NO
		Comments						Operational LoA with UAE ACC, Appendix G : Air Traffic Flow				
9. Are the following CDM elements included as part of your stakeholder's participation in the ATFM process?	1.Provide updated flight plan intent information (e.g., plans, changes, delays) provided by:	- Aircraft Operators	NO		YES	NO	NO	YES	NO	NO	NO	FPL, CHG, DLA, CNL
		- Military	NO		YES	NO	NO	YES	NO	NO	NO	FPL
		- General Aviation	NO		YES	NO	NO	YES	NO	NO	NO	FPL, CHG, DLA, CNL
	2.Telephone conferences	- Airport	NO		YES	NO	NO	YES	NO	NO	NO	OMAA, OMDB, OMSJ, OMRK, OMFJ
		- Military	NO		YES	NO	NO	YES	NO	NO	NO	NO
		- Aircraft Operators	NO		YES	NO	NO	YES	NO	NO	NO	UAE, ETD, FDB, ABY
		- General Aviation	NO		NO	NO	NO	YES	NO	NO	NO	NO
		- ATFM Units	NO		NO	NO	NO	NO	NO	NO	NO	NO
		- Other FIR ANSP's	NO		NO	NO	NO	YES	NO	NO	NO	NO
	3.Web based interfaces	- Airport	NO		YES	NO	NO	NO	NO	NO	NO	OMAA, OMDB, OMSJ, OMRK, OMFJ
		- Military	NO		NO	NO	NO	NO	NO	NO	NO	NO
		- Aircraft Operators	NO		NO	NO	NO	NO	NO	NO	NO	ETD, UAE, FDB, ABY
		- General Aviation	NO		NO	NO	NO	NO	NO	NO	NO	NO
		- ATFM Units	NO		NO	NO	NO	NO	NO	NO	NO	NO
		- Other FIR ANSP's	NO		NO	NO	NO	NO	NO	NO	NO	NO
	Comments									We are developing working measures and procedures for ATFM to be introduced ATFM system by Q4 -2019		

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Sudan	UAE
ATFM Structure and Organization												
10. Does your State provide standardized and recurrent ATFM training for the following personnel and stakeholders? If standardized training is planned, please add date.	1. Personnel performing ATFM functions	- National ATFM center	NO	NO	NO	NO	NO	2020	NO	NO	NO	Q4 2022
		- Area control center	NO	NO	NO	NO	NO	2020	NO	NO	NO	NO
		- Approach control	NO	NO	NO	NO	NO	2020	NO	NO	NO	NO
		- Control tower	NO	NO	NO	NO	NO	2020	NO	NO	NO	NO
	2. Stakeholders	- Airports	NO	NO	NO	NO	NO	2020	NO	NO	NO	NO
		- Aircraft Operators	NO	NO	NO	NO	NO	2020	NO	NO	NO	NO
		- Military	NO	NO	NO	NO	NO	2020	NO	NO	NO	NO
		- General Aviation	NO	NO	NO	NO	NO	2020	NO	NO	NO	NO
	Comments									SANS Staff in charge of ATFM (ATFCM section under ATM department) are scheduled in specialized training on ATFM and it's expected that all Staff will end the training by 2020-2021		
11. Does your State have an electronic ATFM system that displays airborne traffic? Is this system shared? If not, what is the planned date (if any) for sharing this system?	Electronic ATFM display system Shared with:	1. FIR(s)	YES AMAN not shared	NO		NO	NO	YES	NO		NO	Q4 2022
	2. Stakeholders	- Airport Operators	NO	NO	NO	NO		2020	NO		NO	Q4 2022
		- Aircraft Operators	NO	NO	NO	NO		2020	NO		NO	Q4 2022
		- Military	NO	NO	NO	NO		2020	NO		NO	Q4 2022
		- General Aviation	NO	NO	NO	NO		2020	NO		NO	Q4 2022
	Comments									Long Term Planned but not finalized yet		

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
ATFM - Capacity, Demand, Balance												
12. Does your State declare ATC strategic capacity values for the following resources? If capacity value declarations are planned to be completed, please add date.	1.Airspace sectors		YES	YES	YES	NO	NO	2020	NO	Q2/2019	NO	NO
	2.Waypoint(s) or boundaries		NO	NO	YES	NO	NO	2020	NO	Q1/2020	NO	NO
	3.Airport acceptance rate(s) (arrival and departure)		NO		NO	NO	NO	2020	NO	Q1/2020	NO	NO
	Comments									We are validating the ACC sector capacity and then we will move to airport acceptance rate		
13. How are the declared capacity values determined?			Determined by Operations using capacity management studies		Staffing methodology and manning level and procedures (ATM)		NA	Capacity values are not determined		Refer to questionnaire	Not answered	Not Declared
14. Does your State have strategic airport arrival/departure slots? If planned, please indicate the dates:	Airport	Planned date	NA		OJAI & OJAQ (NO-Pending)			OOMS, OOSA 2020			No slots	OMAA, OMDB
	Arrival	Planned date	NA		-						NA	OMAA, OMDB
	Departure	Planned date	NA		-						NA	OMAA, OMDB
15. Does your State have a methodology to balance demand and capacity in the following time frames?	Strategic (more than 1 day before operation)		NO	NO	NO	NO		NO	NO	NO	No methodology	NO
	Pre-tactical (1 day before operation)		NO	NO	NO	NO		NO	NO	NO	No methodology	NO
	Tactical (day of operation)		YES. Tactical oversight of sector volume	NO	NO	NO		YES	NO	NO	No methodology	YES

Question		Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Sudan	UAE
ATFM - Capacity, Demand, Balance											
16. Has your administration (and/or State) implemented procedures, review, and tools to identify available capacity, compare capacity to forecast demand and establish performance targets including. If initiatives are planned, please add date						Not answered			NO	NO	
	1.Airspace design review	Yes. Early 2019	NO	NO	NO		NO 2019	Early 2019	NO		YES
	2.ATFM support tools	YES	NO	YES. Statistical tool			YES	NO	NO		Q4 2022
	3.Procedures review	YES	NO	NO	NO		NO 2019	Mid 2019	NO		YES
	4.Staffing resources to workload / traffic review	YES	NO	YES. ATM Procedures	NO		YES	Mid 2019	NO		YES
	5.ATFM Training completed	NO	NO	NO			NO 2020	NO	NO		Q4 2022
	6.Forecast demand	NO	NO	NO			YES	YES	NO		Q4 2022
	Comments								Currently we evaluate the statistical report and compare the last three years to define the traffic growth percentage and defined the peak hour as well to have an image how is the traffic demand will increase and take the initiative to implement flow management		

Question	Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability										
17. Does your State complete automated exchange of ATS messages (e.g. FPL, CHG, CNL, DEP, DLA, EST, ARR, CPL) with any or all adjacent Flight Information Regions (FIRs) or other non-adjacent FIRs?	OMAE-OLDI OIXX-AFTN EST MSGs	LGGG-OLDI	YES. OSTT, OEJN, HECC, LLLL, ORBB	YES. OBBB, ORBB,OEJN, OIXX, OTBD	YES. All	ONLY WITH OMAE: ABI Advanced Boundary Information Message (including revised ABI's) ACT Activate Message LAM Logical Acknowledgement Message PAC Preliminary Activate Message	NO	SANS is implementing an IFPS that will be ready for operation during 2019. A transition roadmap is under development. The NEW ATM System is sharing the information throw OLDI	Yes (All)	**OOMM:** FPL, CHG, CNL, DEP, DLA **OBBB:** FPL, CHG, CNL, DEP, DLA, EST **OEJD:** FPL, CHG, CNL, DEP, DLA **OIXX:** FPL, CHG, CNL, DEP, DLA, EST
18. Does your State have plans to complete automated exchange of ATS messages with any or all adjacent Flight Information Regions (FIRs) or other non-adjacent FIRs?	OKAC-Early 2019-OLDI OEJN-MID 2019-OLDI Doha Approach - OLDI, early 2019; Dammam Approach in conjunction with OEJD	BY 2020 AIDC with all except LCCC-OLDI	*Estimate Over Border* *OSTT, OEJN, HECC, LLLL, ORBB*		Yes. Nicosia and Damascus	Planned 2019: **Mumbai:** AIDC messages : ABI, PAC, CDN, CPL, ACP, REJ, MAC, LAM, and LRM will be established between Muscat ACC and Mumbai OCC **Jeddah:** ABI Advanced Boundary Information Message (including revised ABI's) ACT Activate Message LAM Logical Acknowledgement Message PAC Preliminary Activate Message	YES. OBBB, OEJN, OMAE date TBD	OJAC by 03/2019 Type X AMHS/SITA BY 2020 with OBBB, OKAC, OOMM	Yes	

Question		Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability											
19. Does your State exchange Airport Acceptance Rate (AAR) information for primary airports with other FIRs? If there are plans to exchange AAR information, please provide date.		NO	Yes. EURO CONTROL	NA	NO	NO	2020 with all adjacent FIRs	NO	NO	NO	NO
20. Does your State share adjacent sector capacity information with other FIRs? If there are plans to exchange sector capacity information, please provide date.		NO		NA	NO	NO	2020 with all adjacent FIRs	NO	NO	NO	NO
21. Does your State have automated Pre-tactical (day prior to the operation) demand monitoring capability? If yes, is the information shared with other		NO		NA	NO	NO	NO	NO	NO		NO
	Airport Demand					NO	NO	NO	NO	NO	NO
	Sector Demand					NO	NO	NO	NO	NO	NO
	Route/Airway Demand					NO	NO	NO	NO	NO	NO
22. Does your State have automated Tactical (day of the operation) demand monitoring capability? If yes, is the information shared with other FIRs?		NO		NA	NO	NO	NO	NO	NO		YES
	Airport Demand					NO	NO	NO	NO	NO	YES
	Sector Demand					NO	NO	NO	NO	NO	YES
	Route/Airway Demand					NO	NO	NO	NO	NO	YES
	Arrival Management					NO	NO	NO	NO	NO	YES

Question	Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Sudan	UAE
Interoperability										
23. Does your State have Strategic, Pre-tactical and Tactical planning agreements with other FIRs?	NO	NO	NO	NO	NO	Only tactical ATFM operations is implemented between Muscat and UAE FIRs. These take the form of a traffic acceptance rate through affected waypoints, based on take-off times. A figure of 3 (three) flights every 10 minutes per waypoint is used and the 10 minute period will start from the imposition of the flow procedures.	NO	NO	NO	NO
24. Are there plans to initiate these agreements?	NO	NO	NO		NO	NO	Yes at the outcome of the ATFM/TF and for future regional event planning.	After implementation of IFPS, we will implement ATFM procedures with Bahrain FIR with progressive introduction of ATFCM operation covering Jeddah FIR as initial phase. The implementation of ATFM measures cane be extended to adjacent FIRs	NO	NO

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability												
25. Has your State identified airports, sectors of airspace or routes which are regularly requiring ATFM Measures to balance demand and capacity? If yes, list them			YES Created High/Low splits to manage volume (East High/East Low, Central High/Central, North/North Low)		NO	NO	NO	Yes . OOMS airport.		YES. Refer to questionnaire	NO	OMDB, ACCE, ACCY, ACCR, ACCW, ACCN
26. Does your State initiated/implemented the following Air Traffic Management Measures (ATFM Measures) internally?						NO	YES			YES	Yes	
	Miles-in-trail (MIT)		YES LATSI LoA	NO	YES	NO	YES	YES	YES	NO	NO	YES
	Minutes-in-trail (MINIT)		NO	NO	YES	NO	YES	YES	NO	YES	NO	NO
	Speed restrictions		YES LoA	YES	YES	NO	YES	YES	YES	YES	YES	YES
	Airborne Holding		YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
	Fix balancing		NO	NO	NO	NO	NO	NO	NO	NO		NO
	Altitude/Flight Level capping		YES-AIP	YES	NO	NO	NO	NO	YES	NO		NO
	Tactical alternative routing options		NO	NO	YES	NO	NO	YES	YES	YES		YES
	Fix crossing times		NO	NO	NO	NO	YES	YES	NO	YES	YES	YES
	Airport slot		NO	NO	NO	NO	NO	YES	NO	NO	NO	YES
	Minimum departure intervals (MDIs)		NO	YES	NO	NO	YES	YES	NO	NO	NO	YES
	Published, pre-defined alternative routes		NO	NO	NO	NO	NO	NO	NO	YES	NO	YES
	Ground delay program (GDP) – airport arrival constraint		NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
	Ground delay program (GDP) – airspace constraint (also known as airspace flow program: AFP)		YES- 5 min departure spacing implemented tactically	NO	NO	NO	NO	NO	NO	NO	NO	YES
27. When determining an ATFM Measure, are the following factors considered?	Demand exceeds capacity		YES		NO		YES	YES	YES	YES		
	Weather		YES		YES		YES	YES	NO	YES		YES
	Military exercises		YES		YES		YES	NO	NO	YES		YES
	Resources		YES		YES		YES	YES	NO	YES		YES
	Maintenance / outages		YES		YES		YES	YES	NO	YES		YES
	VIP movements		YES		YES		YES	YES	NO	YES		YES

Question	Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability										
28. Does military airspace/activity cause the use of ATFM Measures? If yes, please explain.	NO		NO	NO	YES	NO	NO	In general, yes, because when Reserved Military Airspace is active, the available airspace for civil flights is impacted leading to apply ATFM measures	NO	NO
29. Is the military airspace/activity included in strategic planning?	YES		YES		NA	NO	NO	Yes, it's included, and the civil military coordination section is working on flow management measure initiatives through Joint-committee		NO
30. How is the effectiveness of the ATFM Measure analyzed?	Periodic procedures review		NA		NA	The use of flexible statistical tools to effectively analyze and report on the metrics	NA	By measuring the degree of implementation		Departures: o Monthly DST Compliance and Ground delay Arrivals: o Runway throughput and airborne delay

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability												
31. What are the primary demand-capacity imbalance reasons for the ATFM Measures?	Airport capacity				NO			OOMS		OEJN, OERK, OEMA, OEDF and OEAB		OMDB
	Sector capacity		East High, Central, North - demand exceeds capacity;		YES			Central sector	YES	ACC-West, ACC-northeast upper and lower		
	Route/Airway capacity				NO			TONVO A777 NADSO and LALDO B525 NADSO	YES	L604, L677, L550& UL768		
	Other				NO							
	Comments				procedure includes the formula							
32. Does your State initiate the following ATFM Measures with adjacent FIRs?	Miles-in-trail (MIT)		OMAE		YES	NO	YES	OMAE	NO	YES		OOMM, OIIX, OBBB
	Minutes-in-trail (MINIT)		NO		YES	NO	YES	OMAE	NO	YES. Muscat, Bahrain, Cairo, Jordan, Khartoum, Sanaa and		OEJD
	Speed restrictions		NO		YES	NO	YES	OMAE	NO	YES		OOMM, OIIX, OBBB, OEJD
	Airborne Holding		NO		NO	NO	YES		NO	YES		OOMM, OIIX, OBBB, OEJD
	Fix balancing		NO		NO	NO	NO		NO	NO		OOMM, OIIX, OBBB, OEJD
	Altitude/Flight Level capping		OMAE, OKAC		NO	NO	NO		NO	YES. AMMAN, DOHA, BAHRAIN, KUWAIT & CAIRO		OIIX, OOMM
	Alternative routing options		NO		NO	NO	NO	OMAE	NO	YES		OBBB, OEJD, OOMM
	Fix crossing times		NO		NO	NO	YES	OMAE	NO	YES		OOMM, OEJD
	Airport slot		NO		NO	NO	NO		NO	YES		NO
	Minimum departure intervals (MDIs)		NO		NO	NO	YES		NO	YES		OOMM, OIIX
	Published, pre-defined alternative routes		NO		NO	NO			NO	YES		NO
	Ground delay program (GDP) – airport arrival constraint		NO		NO	NO			NO	YES		OOMM, OEJD
	Ground stop (GSt)		OMAE, OEJD, OKAC		NO	NO			NO	YES		OOMM, OIIX, OBBB, OEJD
	Ground delay program (GDP) – airspace constraint (also known as airspace flow program: AFP)		NO		NO	NO			NO	YES		NO
33. What is taken into consideration when an ATFM Measure is implemented			Volume and sector capacity, weather, outages		Delay action/holding/miles in trail/minutes in trail			ATCO workload, traffic demand/sector capacity, Airspace complexity and weather.	Capacity overload	• Reduction of ATCOs workload to ensure the safe provision of ATS; • Reduction of congestion and operating costs		Demand Exceeds capacity, Weather, Military Exercises, Resources, Maintenance/ Outages, Vip movements

Question	Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability										
34. How is the duration of the selected ATFM Measure determined?	Tactical decision based on real-time information		Regional coordination.			The duration of the selected ATFM Measure is determined based on extent of over demand	By traffic levels	Declared capacity will be the main factor that is considered in the application of ATFM measures. When the capacity is reached, ATFM measures are applied until the capacity is exceeding the demand by at least 10%. Therefore, the timing will vary demanding on the level of traffic		Sector and aerodrome forecast, as well as duration requirements by accepting unit
35. Does your ANSP carry out any post-operations analysis?	NO		NA			PACA carry out any post-operations analysis using the flexible statistical tools to generate report on the metrics	NO	SANS are using the post-analysis to determine the bottleneck, Peak hour, congested airway, waypoint and congested aerodrome. This practice will improve enhance with the implementation of activation of ATCFM section		YES

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Sudan	UAE
Interoperability												
36. How is the effectiveness of the ATFM Measure analyzed?			NA		NO			The use of flexible statistical tools to effectively analyze and report on the metrics	Unknown	Refer to question number 30		Departures: o Monthly DST Compliance and Ground delay Arrivals: o Runway throughput and airborne delay
37. Are the ATFM Measures included in LOAs?			YES		NO	NO	YES	Operational LoA with UAE ACC, Appendix G : Air Traffic Flow Management	NO	No, it will be included in the ATM operation manual and later on LoA		YES
38. Does your State communicate ATFM Measures through automated or verbal communication with adjacent FIRs?	Miles in trail		Automated and verbal with OKAC, OEJD, OMAE		Verbal		Verbal	Verbal OMAE		Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum,		Verbal
	Speed restrictions				Verbal		Verbal	Verbal OMAE				Verbal
	Holding				Verbal		Verbal			Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum, Kuwait,		Verbal
	Altitude				Verbal		Verbal	Verbal OMAE		Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum, Kuwait,		Verbal
	Fix crossing times				Verbal		Verbal	Verbal OMAE		Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum, Kuwait,		Verbal
	Airport arrival times				Verbal					Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum, Kuwait,		Verbal
	Ground delay programs – airport arrival constraint				Verbal					Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum, Kuwait,		Verbal
	Ground stops		Verbal		Verbal					Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum, Kuwait,		Verbal
	Ground delay program – airspace constraint				Verbal					Verbal: Muscat, Bahrain, Cairo, Jordan, Khartoum, Kuwait,		Verbal
	Comments		Miles in trail by NOT AM		Verbal							

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability												
39. If your State have future ATFM initiatives planned **with other FIRs** please list them below.			NA		NA							
	Initiative Title							Regional ATFM Implementation with MID Member States			Waiting for regional initiatives	Cross Border Arrival Management (X-MAN)
	Primary Functions											Absorb delay en-route
	Status (Planning, Approved, Implementation, Testing)							Planning				Planning
	Initial Operational Capability Date							TBD				Q2 2019
	Full Operational capability Date							TBD				Q2 2021
	Initiative Title											
	Primary Functions											
	Status (Planning, Approved, Implementation, Testing)											
	Initial Operational Capability Date											
	Full Operational capability Date											
	Initiative Title											
	Primary Functions											
	Status (Planning, Approved, Implementation, Testing)											
	Initial Operational Capability Date											
	Full Operational capability Date											

Question		Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Sudan	UAE
Interoperability											
40. If your State have future ATFM initiatives planned, please list them below.				NO							
	Initiative Title						CDM EXCHANGE OF DATA with UAE		SFAC-ATFCM Saudi future airspace concept project and air traffic flow and capacity management system	Waiting for regional initiatives	Airport CDM and Departure Manager
	Primary Functions								Re-structuration of the whole airspace and implementation of ATFM system		Collaborative Departure Sequencing
	Status (Planning, Approved, Implementation, Testing)						Planning		Planning/Tendering		Testing
	Initial Operational Capability Date								2022		Q4 2018
	Full Operational capability Date								2023		Q2 2021
	Comments	Bahrain is in the process of building a new FIC and implementing a new ATM system which will include integration of ATFM functionality such as SWIM capabilities, AMAN/DMAN. Est. completion mid 2020.									
				NO							
	Initiative Title						CDM EXCHANGE OF DATA with UAE		IFPS initial flight plan processing system	Waiting for regional initiatives	
	Primary Functions								Exchange ATS service massages and FPL		
	Status (Planning, Approved, Implementation, Testing)						Planning		In progress, designing phase		
	Initial Operational Capability Date								Q4/2019		
	Full Operational capability Date								Q2/2020		

Question			Bahrain	Egypt	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabi	Sudan	UAE
Interoperability												
41. ICAO has identified various ATFM and CDM initiatives in the Aviation System Block Upgrades (ASBU) process (Block 0 and Block 1 to be implemented by 2018). Please identify which of the following have been implemented or are planned to be implemented:	B0- A-CDM *Improved Airport Operations through Airport-CDM*		End 2019 Planning/Coordination completed. Design/config. In progress		Implemented		Planned	2019	Mid 2019	TBD		Q4 2020
	B0-RSEQ *Improved Traffic Flow through Runway Sequencing (AMAN/DMAN)*		Partially Full by 2020		Not Implemented			2019	Mid 2019	Q3-2019		Implemented
	B0-FICE *Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration*		Partially Full by 2021		Planning no date		Planned	2019		End of 2019 AMHS capability End of 2019 AIDC/ OLDI capability end 2019		Implemented
	B0-DATM *Service Improvement through Digital Aeronautical Information Management*		Implemented		in the process		Planned	2020		Ongoing. Ref questionnaire		Implemented
	B0-FRTO *Improved Operations through Enhanced En-Route Trajectories*		Partially Full by 2020 Current status: Pre Tactical basis		Implemented		Planned	2019		Ongoing. Ref questionnaire		Q4 2020

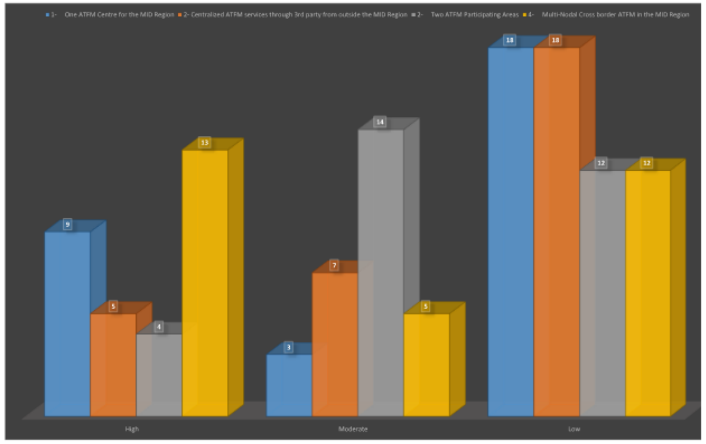
	B0-NOPS *Improved Flow Performance through Planning based on a Network-Wide view*		Partially Established ATFM measures		NO		Planned	2020		2022		Q4 2022
	B1- A-CDM *Optimized Airport Operations through A-CDM Total Airport Management*		End 2019		NO			2020		TBD		Q2 2021
	B1-RSEQ *Improved Airport operations through Departure, Surface and Arrival Management*		Partially full by 2020		NO			2019		2021		Q2 2021
	B1-FICE *Increased Interoperability, Efficiency and Capacity through FF-ICE/1 application before Departure*		Partially Full by 2020		NO			2019		2020		Q2 2021
	B1-DATM *Service Improvement through Integration of all Digital ATM Information*		Partially Full by 2020		NO			2020		2021		Q2 2021
	B1-SWIM *Performance Improvement through the application of System Wide Information Management (SWIM)*		2020		NO			2022		Q4 2020		Q2 2019
	B1-NOPS *Enhanced Flow Performance through Network Operational Planning*		Dependent on Regional agreement Planning phase		NO			2022		2022		Q4 2022
	B1-AMET *Enhanced Operational Decisions through Integrated Meteorological Information*		2020		Ongoing			2022		Q4 2020		Q4 2020
	B1-TBO *Improved Traffic Synchronization and Initial Trajectory-Based Operation*		Partially by 2020		NO			2022		Q4 2020		Q4 2020

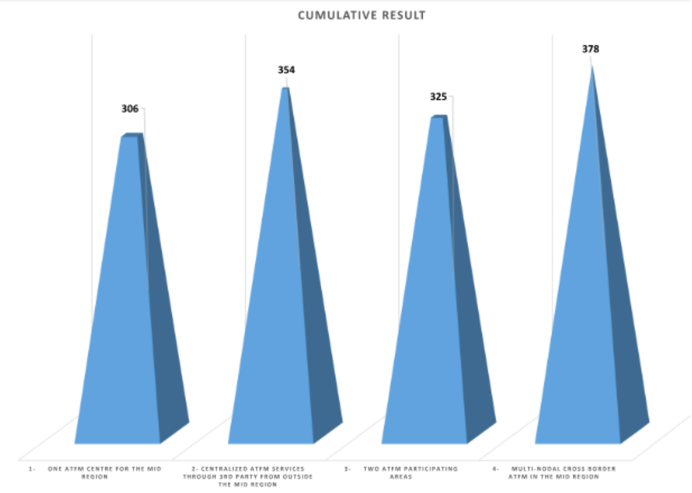
ATTACHMENT D - Evaluation of possible MID ATFM Scenarios and their results

	Criteria/Advantages/Challenges	1- One ATFM Centre for the MID Region	2- Centralized ATFM services through 3rd party from outside the MID Region	3- Two ATFM Participating Areas	4- Multi-Nodal Cross border ATFM	Weight (1 to 6)	1- One ATFM Centre for the MID Region	2- Centralized ATFM services through 3rd party from outside the	3- Two ATFM Participating Areas	4- Multi-Nodal Cross border ATFM
1	Institutional Framework (legal, financial, funding mechanism, etc.)	3	3	4	5	6	18	18	24	30
2	Time required for the States to join the project (legal, Financial, etc.)	1	2	3	5	6	6	12	18	30
3	Political issues	1	1	3	5	6	6	6	18	30
4	Agreement on the Location	1	5	3	5	6	6	30	18	30
5	Funds required as a regional project (Centre) (cost)	3	1	2	5	6	18	6	12	30
6	Manpower (Centre)	3	5	1	5	4	12	20	4	20
7	Harmonized ATFM National procedures	5	3	4	3	3	15	9	12	9
8	Centralized Decision Making	5	5	4	2	3	15	15	12	6
9	Regional and cross regional coordination	5	5	4	2	3	15	15	12	6
10	Data Consistency/availability	5	5	4	3	3	15	15	12	9
11	Time needed for establishing the ATFM Framework	2	5	3	5	4	8	20	12	20
12	Third party could provide the service	5	5	5	0	2	10	10	10	0
13	Single system supplier and maintenance	5	2	3	0	2	10	4	6	0
14	Evolution process	5	3	4	3	2	10	6	8	6
15	Concentrated Team	5	5	3	2	2	10	10	6	4
16	Crisis management	5	5	4	4	2	10	10	8	8
17	Effective Airspace Management	5	5	3	2	2	10	10	6	4
18	Integration with regional IFPS	5	5	4	2	2	10	10	8	4
19	Stakeholders simplicity	5	5	3	2	3	15	15	9	6
20	Data collection that would be used by States	5	5	4	2	2	10	10	8	4
21	Centralized Post Assessment process	5	5	4	2	2	10	10	8	4
22	Support optimization of the use of the MID Region available airspace	5	3	4	3	2	10	6	8	6
23	Research and Development at regional level	5	5	5	2	2	10	10	10	4
24	States' willingness for Data Sharing with the ATFM Regional Centre(s) including Military Flights	2	2	2	5	6	12	12	12	30
25	Contingency Operations	1	5	5	5	3	3	15	15	15
26	local customization and integration systems	1	3	2	5	1	1	3	2	5
27	Common ATFM Messages Format	5	5	4	2	2	10	10	8	4
28	Compliance with ATFM Measures	5	5	3	2	2	10	10	6	4
29	Possibility of successful implementation	1	2	3	5	6	6	12	18	30
30	Timeframe to start operation	1	3	3	4	5	5	15	15	20
		306	354	325	378	100	306	354	325	378

Legend : *Rating from 0 to 5 (5 is the best)*

Challenge





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PART II – MID ATFM CONCEPT OF OPERATION (CONOPS)

PART II

MID ATFM CONOPS

1- Overview

Concept Development and references

1.1 This MID Regional Air Traffic Flow Management (ATFM) Concept of Operations (CONOPS) was developed based on ICAO Doc 9971 and the Asia/Pacific Regional ATFM CONOPS

1.2 The Concept was tested in a series of Human-in-the-Loop (HITL) simulation exercises held at various ANSPs. It is based upon operationally proven *ATFM Measures* used to more efficiently manage delays incurred by all aircraft operating to a constrained resource, such as an airport or a sector of airspace, regardless of their point of departure and including flights controlled by ANSPs outside the control authority of ATC at the constrained resource.

Fundamental Concept of ATFM

1.3 Central to this CONOPS is the fundamental concept of balancing air traffic demand and capacity. While ANSPs and airport operators should strive to increase and optimize airspace and airport capacity to meet demand, traffic growth, surges in traffic and capacity constraining events cause imbalances. ATFM measures that may be utilized include *inter-alia* strategic landing slot allocation, miles/minutes in trail, level capping, re-routing and tactical airport slot allocation.

1.4 Implementation of effective ATFM improves predictability, reduces fuel burn / emissions and operating costs, reduces pilot and ATC workload, improves or maintains safety and equity.

ATFM and Collaborative Decision-Making

1.5 The Collaborative Decision Making (CDM) process, a key enabler of ATFM, allows all of its subscribing members, called CDM stakeholders, to participate in decisions that affect them after all relevant information has been made available to them. This applies to all types of decisions in the strategic, pre-tactical, and tactical phases.

1.6 **Figure 1** illustrates the integration of CDM into ATFM functions. The flow shows the independent evaluation of capacity and demand for the resource, the monitoring of the demand and capacity, the evaluation of ATFM measures, the involvement of stakeholders through CDM, and the execution and updating of the ATFM measures. Core functions of shared situational awareness and post-operations analysis are supported across all functions.

1.7 Using the available data, demand and capacity are monitored throughout the day by close communication and collaboration with other resource managers to identify any imbalances. Flow Managers have tools in order to evaluate various ATFM measures and organize CDM stakeholders participation and agreement before implementation. Once an ATFM measure is implemented, all stakeholders will stick to the plan to optimize their operations while monitoring the effectiveness of the measure implemented.

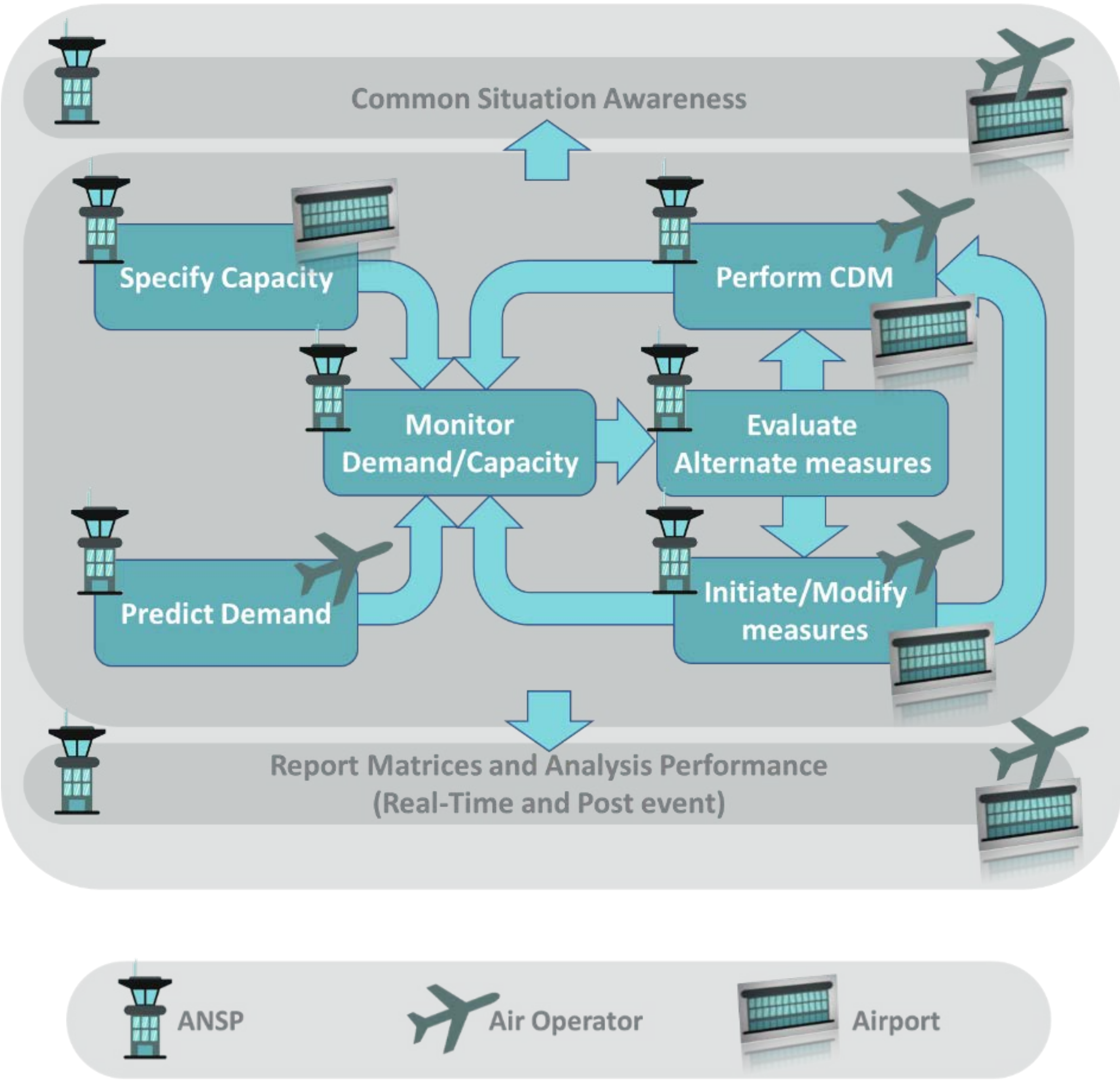

Figure 1: ATFM/CDM Functions

2- Scope

2.1 This document presents the regional ATFM CONOPS, supporting demand and capacity balancing for airports and airspace within the MID Region. The Concept includes existing ATFM/CDM principles that complements the ATFM measures currently in practice, such as conventional Ground Delay Programs (GDPs) or airborne holdings.

2.2 (CDM) is a key component of the CONOPS and is covered throughout this document. The CONOPS may be applied to any airport or airspace within the MID Region or elsewhere, especially in those airports or airspace serving significant number of international flights.

Document Overview

2.3 The document first discusses current operations and providing the justification for the Regional ATFM Concept. The proposed concept is then provided, followed by an operational scenario illustrating the concept, and finally the expected benefits.

2.4 The Concept will affect each stakeholder differently. The specific roles of each stakeholder group are detailed; Flow Management Position (FMP), Aircraft Operators, Airport Operators, ATC Tower, ATC Approach and ATC Area Control Centre roles are explained in Section 4.

The document has the following Sections:

- **Section 3 - Current Operations**, describes the current status of ATFM operations in MID region and the associated need for improvement.

- **Section 4 - Proposed Concept** – **Regional ATFM**, provides a detailed description of the concept, including assumptions, core capabilities, stakeholder responsibilities, and policy considerations. The section first describes the parts of the concept that must be consistent for any implementation of Regional ATFM. Implementation considerations, adaptable according to the needs of individual ANSPs are also described.

- **Section 5 - Operational Scenario**, illustrates an example of the step-by-step procedures for handling a given capacity reducing event, following the Regional ATFM Concept.

- **Section 6 - Expected Benefits of Proposed Concept**, presents a summary of the expected benefits resulting from the implementation of the proposed concept.

3- Current Operations in the MID Region

3.1 ANSPs in the MID Region currently have limited ATFM/CDM procedures in place to manage the traffic flows within their Flight Information Regions (FIRs). There is also lack of regional agreement to manage traffic flows between ANSPs. Some MID States do have some tools and processes to monitor and predict resource utilization, but the predictions are not always accurate, automated, or cross-border shared.

3.2 Strategic balancing of capacity at airports in the MID Region is currently undertaken through the airport slot allocation process or the application of Minimum Departure Intervals (MDIs). During the pre-tactical and tactical ATFM phases[1], balancing of arrival demand with the available capacity at airports is mostly reactive in nature. Planning ATFM measures ahead of time is difficult because the demand data are not generally accurately predicted and there is limited control of departures. As a result, most of the demand balancing is carried out by ANSPs within their own area of responsibility through tactical flow management in some FIRs with the support of arrival management systems (AMAN). This reactive management of demand often results in inefficient means of balancing flows, such as airborne holding and vectoring.

3.3 A challenge in terms of implementing an advanced ATFM system within the Region is the high percentage of international traffic. This characteristic poses a challenge to implementation due to the cross-border effect of ATFM measures such as Ground Delay Programs (GDPs) that assign flights with Calculated Take-Off Times (CTOTs) to comply with. Current, flights departing from airports outside of the ANSP's controlling authority operate as they originally intended, without absorbing all or even some of the delay. Accordingly, a new cross-FIR boundary concept is proposed to overcome this challenge and effectively apply ATFM measures to flights operating into constrained airports and airspace, while operating from airports or in the airspace of a different control authority.

3.4 There are, however, several ANSPs in the MID Region controlling significant domestic traffic, such as Egypt, Iran, Iraq and Saudi Arabia, where GDPs might be effective with only domestic traffic operating in accordance with assigned slots.

<u>Successful Implementation Example 1: Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT)</u>

3.5 International collaboration for demand and capacity balancing has been demonstrated by initiatives such as the Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT).

3.6 BOBCAT is a secure web-based computer system used to manage westbound aircraft operating through Afghanistan airspace from South and Southeast Asia to Europe during the busy nighttime period.

3.7 As a result of the lack of Communication Navigation Surveillance (CNS) facilities and military operations aircraft flying through this airspace are subject to restrictive separation requirements. In 2006 ICAO, upon request of IATA, formed a task force to implement a solution to the restrictions placed on aircraft flying through Afghanistan Airspace. AEROTHAI consequently developed a web-based solution which was implemented in July 2007.

3.8 BOBCAT assigns take-off times (departure slots) and levels for flights crossing the Kabul FIR based on Aircraft Operator requests. The request period is specified and the slot allocation occurs based on the existing requests. Aircraft Operators can request adjustments to the slot allocated based on their operational need and availability.

3.9 Some of the benefits realized since implementation of BOBCAT are:

[1] Strategic, Pre-Tactical and Tactical ATFM Phases are defined in ICAO Doc 9971 – *Manual on Collaborative Air Traffic Flow Management*

- Regularity of departures
- Orderly Afghanistan entry
- Optimal FL achieved (80 – 90% in Afghanistan)
- Reroutes and technical stops eliminated
- Reduction of Air Traffic Control Officer and flight crew workloads
- Environmental Outcomes (Annual, based on IATA estimates in 2007):
    - Estimated Airline Cost Savings: US$86 million
    - Estimated Fuel Savings: 85,000 metric tons
    - Estimated Emissions Savings: 356,000 metric tons

Successful Implementation Example 2: ATFM in Australia

3.10 Air services Australia has an automated ATFM system where projected demand and capacity are balanced through the implementation of ATFM measures, predominantly GDPs, and the assignment of ATFM slot times to aircraft. Aircraft Operators are advised of flight-specific off-block times at the domestic departure airports. These off-block times are calculated to deliver aircraft to the destination airport at the allocated arrival slot time. The ATFM system is used for pre-tactical and tactical planning and managing the arrival flows associated with the major Australian airports of Sydney, Melbourne, Brisbane, and Perth. The system offers effective pre-tactical and tactical decision support for managing demand-capacity imbalances and reducing air traffic saturation. CDM is supported through flight schedule updates, shared situational awareness, and schedule management (e.g., substitutions and cancellations).

Successful Implementation Example 3: ATFM in Japan

3.11 In 2005 the Japanese Civil Aviation Bureau (JCAB) established the Air Traffic Management Centre (ATMC) by recomposing the existing ATFM Centre to act as the leading and central function in order to drive forward Japanese Air Traffic Management (ATM). Through this office they are developing and implementing typical ATFM measures such as GDPs with slot swapping capability, re-routing, miles/minutes in trail, and Specifying Calculated Fix Departure Time for Arrival Spacing Program (SCAS). The ATMC has implemented CDM practices through twice-yearly stakeholder meetings and making available dynamic capacity changes every hour using web-based information sharing.

4- Concept – Regional ATFM

4.1 The regional concept was developed specifically for ANSPs in the MID Region based on APAC experience and could also be implemented in other regions. The MID Region is comprised of independent ANSPs, each managing traffic in their respective FIR with no overarching authority for the entire Region such as EUROCONTROL in Europe. The ATFM Concept for the MID Region is based on a model of distributed authority throughout the Region. Each individual ANSP will be responsible for issuing ATFM Measures to balance demand with capacity for airports and airspace within their FIR. Aircraft Operators will adhere to the ATFM policies, rules, and guidelines as defined and shared by the ANSP. Other stakeholders support each ANSP's ATFM measures as further described in this CONOPS.

4.2 The Concept is described from the perspective of a single ANSP managing the flow of traffic to a constrained resource. These individual ATFM systems will communicate to ATFM systems in other ANSPs and continuously update them, providing the authorized stakeholders with a consistent and up to date network-wide information.

Concept Overview

4.3 ICAO Doc 9971 – Manual on Collaborative Air Traffic Flow Management is the foundation of the Regional ATFM concept. While this document provides guidance for harmonizing ATFM concepts across the world, different States and Regions still have the flexibility to devise policies and procedures to best suit their individual circumstances, at the same time keeping a balance between this and a network-wide seamless flow of traffic. The concept for Regional ATFM considers the unique characteristics of the MID Region, such as high international traffic volume from a wide variety of aircraft operators, and the large number of small FIRs.

4.4 Within the MID Region there is a need to balance demand against capacity at airports with a high concentration of international traffic during the pre-tactical and tactical phases. In the majority of ANSPs that have advanced ATFM capabilities implemented, GDPs are used to effectively match the demand with the airport capacity by redistributing the demand by issuing departure times to flights operating within the control authority of the ANSP, in some cases responding to adjacent FIR requirements. This trades airborne holding for ground delay, which is the fundamental benefit of a GDP. The Regional ATFM concept adopts the GDP as the foundation of operations, but with several key differences.

4.5 One of the parameters for a GDP is the scope of non-exempt and exempt flights. Exempt flights are considered in the demand but are not expected to respond to an ATFM control time. Reasons for exempting flights include flights departing outside of a certain distance or international flights. The longer flights are typically exempted when a GDP is implemented due to a capacity reducing event that has potential to be cancelled early; if many flights are airborne at the time the ATFM measure is cancelled, they will have absorbed delay that cannot be recovered. International flights are normally exempted from GDPs because ANSPs do not have the authority to delay flights departing from airports outside of their control, and due to the fact that international flights generally travel longer distances. However, the Regional ATFM concept, which aims to address cross-border ATFM, includes short- and long-haul international flights to achieve optimized demand/capacity balancing at constrained resources.

4.6 When a GDP is implemented, exempt flights are assigned to slots first, followed by non-exempt flights—meaning exempt flights will receive minimal delay. Even though exempt flights are issued a slot, they are not required to absorb any delay assigned by the GDP. As a result, it is important to have sufficient "participation" (i.e. a high volume of non-exempt flights) in order to implement a fair and effective GDP.

4.7 In the region, there are operational models where ANSPs do not allocate slot times for exempted flights and have given the flexibility to aircraft operators to depart at the strategically approved departure times.

4.8 ANSPs set the rules by which flights are exempted based on agreements with airlines, ANSPs, or airports. One of the main challenges is achieving agreements with enough stakeholders to issue effective GDPs. ATFM/CDM models in other parts of the world only include domestic traffic in ATFM measures (GDP and ground stop [GS]). In the majority of the MID States, where majority of traffic is international, this model cannot be applied.

4.9 Data analysis studies were conducted for Singapore's Changi Airport to estimate the percentage of non-exempt traffic needed to implement effective programs. Based on the analysis and operational experience in the U.S., South Africa, and Australia, a participation level of 75% is desirable for effective and equitable AFTM using existing GDP principles (see Attachment B for a summary of the Singapore participation case study).

4.10 The Regional ATFM concept consequently requires participation from many departure airports, ANSPs, and airlines to achieve a high level of non-exempt flights. For this reason, one of the fundamental principles of the Regional ATFM concept is providing Aircraft Operators (i.e. airlines) the ability to specify their delay absorption intent between ground delay and airborne flying time adjustments to achieve their assigned ATFM arrival slot. This overall flexibility is expected to increase participation by giving long-haul flights the ability to take their delay in the air, where the delay can be recovered if the program is cancelled early. Also, flights that are airborne at the time the program is implemented will be able to absorb program delay in this concept, further increasing participation.

<u>Delay Absorption Intent</u>

4.11 One unique aspect of the Regional ATFM concept is that instead of flights being required to take all of the delay on the ground, Aircraft Operators can choose how to distribute the delay assigned via the ATFM measure throughout various phases of flight. The three delay intent fields are described below.

- **Gate Delay Intent:** Delay intended to be taken while parked at the gate. By default, pre-departure flights are assumed to take all program delay at the gate. Before the flight pushes back, the Aircraft Operator has the ability to move all or a portion of the delay to the Airport Surface Delay Intent and/or the Airborne Delay Intent.

- **Airport Surface Delay Intent:** Delay intended to be taken between pushback and takeoff. This allows for flights to plan taking additional ground delay in cases where the airport or ATC requires the parking stand to be vacated prior to the absorption of all intended ground delay.

- **Airborne Delay Intent**: Delay intended to be taken efficiently during the cruise portion of the flight. For flights that are airborne or will soon be airborne when the ATFM measure is implemented, all of the program delay is assigned to the Airborne Delay Intent. The ability to absorb program delay in the air is not part of any current operational ATFM system.

4.12 **Figure 2** illustrates the opportunity for absorbing delay in various phases of flight.

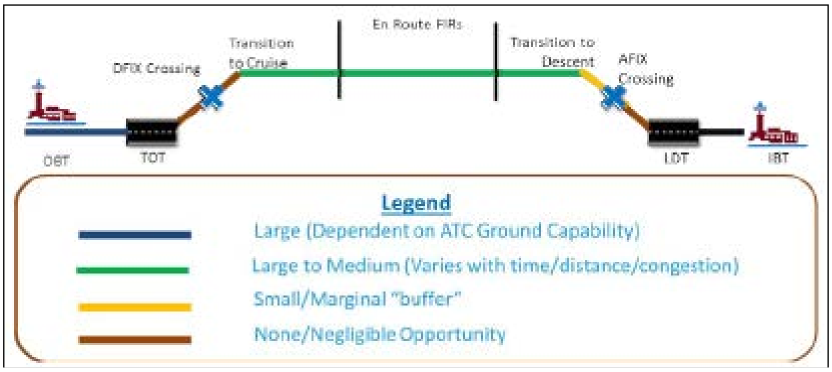

Figure 2: Opportunity for Absorption of Delay per Phase of Flight

4.13 Permitting flights to absorb ATFM program delay in the air can increase the number of flights participating in the program. In current ATFM systems GDPs generally exempt longer distance flights (e.g. flights traveling more than 2000 NM) due to risk of such flights taking unrecoverable delay; these flights could absorb delay on the ground, depart, and then the constraint at the arrival airport does not materialize, meaning that the flight absorbed delay unnecessarily.

4.14 Under the Regional ATFM concept, these longer flights can fly at a slower speed without any increase in fuel burn. For example, one study has shown that a flight between Rome and Paris can decrease its cruise speed by about 6% without changing altitude or fuel burn (**Figure 3**). The risks of long haul flights either taking unrecoverable delay or not participating in the ATFM program are decreased.

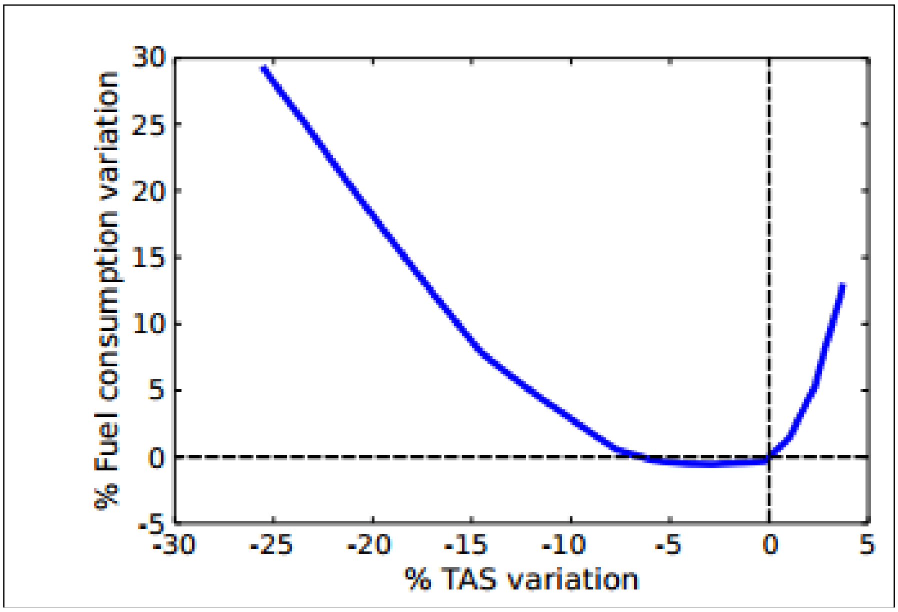

Figure 3: Fuel consumption variation for A320 Rome-Paris, F320, Mach 0.78, Cost Index 25 [Muñoz 2013]

4.15 Aircraft Operators may notify their delay intent by using one of two methods:

- via a web-based interface; or
- via a new flight plan or flight plan amendment.

4.16 When using the web interface, the Aircraft Operator directly enters the delay intent fields demonstrated in **Figure 4**. The aircraft operator may apportion some or all of the total delay to any of the three fields.

4.17 If the flight plan method is used the ATFM system infers the Intended Gate Delay and Intended Airborne Delay based on the filed Estimated Off-Block Time (EOBT) and filed Estimated Elapsed Time (EET) extracted from the new or amended flight plan.

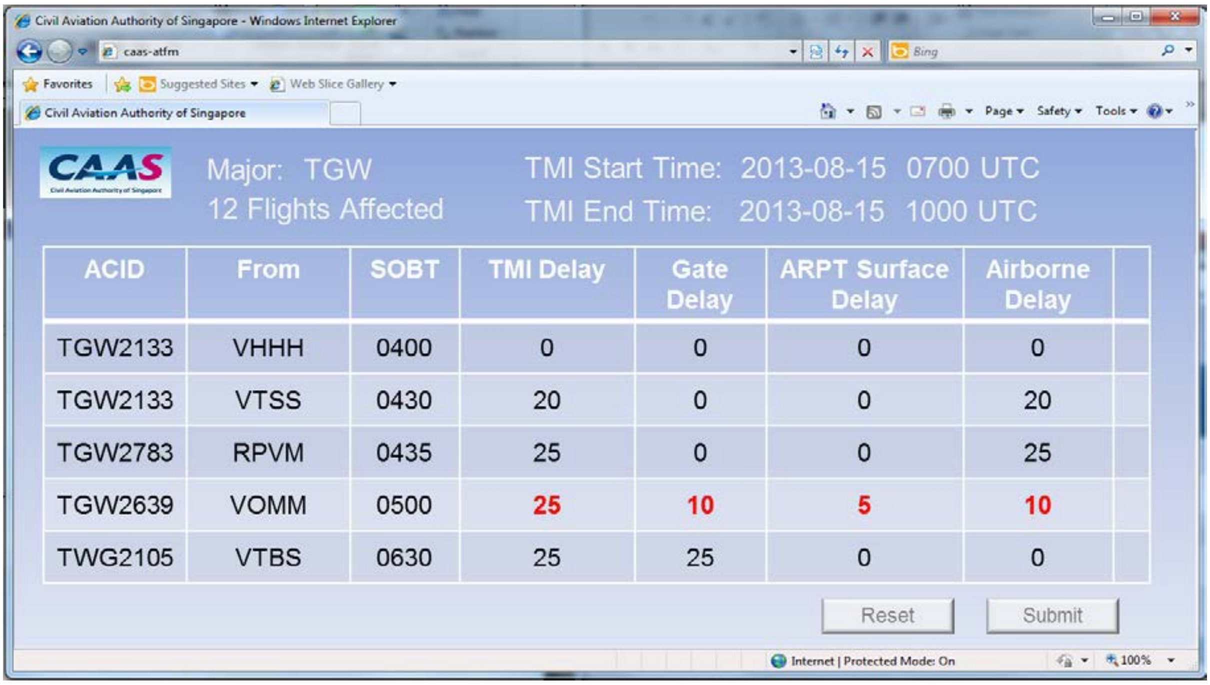

Figure 4: Example of web-based interface for delay absorption intent.

4.18 If the flight plan method is used to submit delay intent, en-route ATC will be aware of the flight-planned cruise speed and will control the flight appropriately. Flights that specify airborne intent via the web interface are expected to communicate their intended cruise speed to en route ATC as a request per current ATC procedures. ATC will continue to control the flight as done in current operations but may assist the pilot in meeting their intended airborne delay. This approach minimizes the required training and involvement of en-route ATC for the deployment of this Regional ATFM concept. Involvement of en-route ATC is a future consideration for the concept.

4.19 Since many of the major airports in the MID Region are IATA level 3 (Slot Controlled Airports), much of the work to balance demand and capacity in the strategic ATFM phase is already taking place. This process requires a rigorous analysis of the airport operations in order to determine the capacity of the airport. The scheduled demand is usually coordinated during bi-annual IATA Slot Conferences.

4.20 Airport Strategic Slot information is used by the ATFM process to transition from the strategic plan to the pre-tactical plan, then to the tactical plan on the day of operations. The flight data from the Strategic Slots is loaded in the ATFM System by the Aircraft Operators or ANSP at least one day prior to the day of operations. **Figure 5** shows a sample of the type of demand graph that should be available to the relevant stakeholders to quickly identify periods of demand-capacity imbalances and decide whether or not an ATFM measure must be implemented.

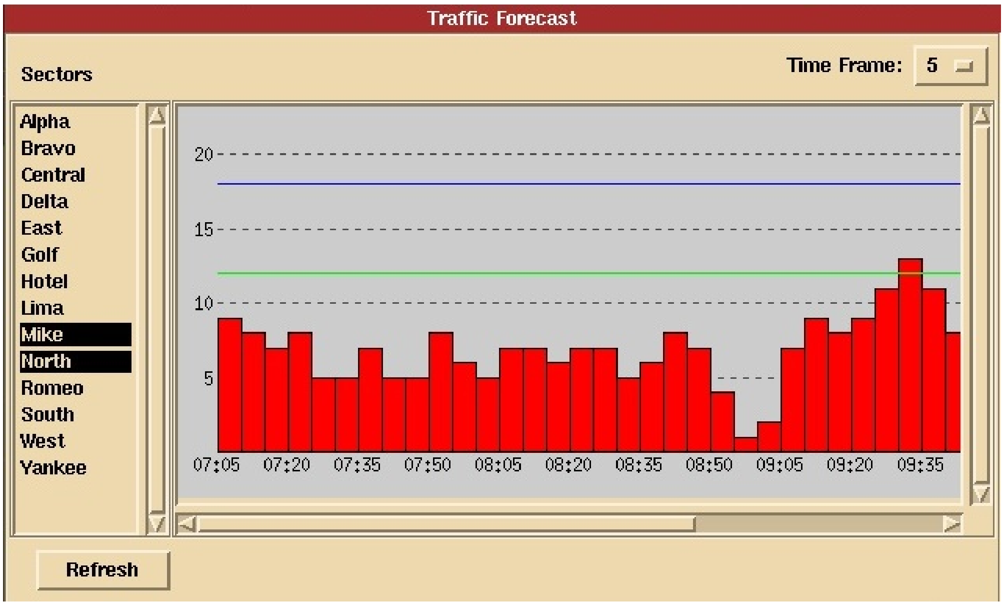

Figure 5: Example of capacity and demand

4.21 The stated capacity may change throughout the day due to operational factors or forecast weather. Capacity rates can be loaded into the ATFM system to reflect the capacity during a specific time period. For example, runway configuration changes could vary the rates in a predictable manner.

<u>Initiating an ATFM measure</u>

4.22 The Flow Management Position (FMP) continuously monitors the demand and capacity. When the current or predicted demand exceeds the capacity, the FMP will determine whether or not an ATFM program is needed based on the severity of the demand-capacity imbalance as well as feedback from CDM stakeholders. Before implementing ATFM measure under an ATFM program, the FMP and CDM stakeholders will have the ability to model with different parameters, including:

- Start and end time
  - Flights with estimated landing times within the start and end time of the program will receive ATFM slots
  - Non-exempt and exempt flight criteria
- Exemption criteria by: airline, airport, distance from arrival airport, or flight
  - Airborne Exemption Horizon: Flights that are airborne when the program is initiated and expected to land within the Airborne Exemption Horizon are exempted from the program
- Airport Acceptance Rate (AAR)
  - Number of aircraft that can land at the airport in a given time bin based on the predicted conditions
- Required Notification Time
  - When an ATFM measure is run, pre-departure flights that are expected to depart sooner than the Required Notification Time will have a default delay intent to absorb all of their delay in the air

4.23 The FMP will evaluate if the demand is sufficiently smoothed and also consider the average delay, maximum delay, and the number of affected flights to determine the impact of the ATFM program. Once the optimal parameters are set, the FMP runs the program and slot times are sent to Aircraft Operators, air traffic control towers, and other stakeholders.

Maximum Delay concept

4.24 Included in the concept it is the acknowledgment that certain flights will have a limited amount of delay that can be absorbed. For example, an active flight cannot absorb any delay on the ground and will only be able to efficiently absorb a limited amount of delay in the air based on remaining flying time. Also, flights may have a limited amount of delay they can absorb on the ground due to constraints of the departure airport. For example, if some airports have very high gate utilization and very few holding areas, the amount of ground delay for a flight will be limited.

4.25 To address this, the concept includes a component termed Maximum Delay. Maximum Delay is made up of three parameters: *Maximum Gate Hold*, *Maximum Surface Hold*, and *Maximum Airborne Adjustment*. The Maximum Gate Hold can be provided by the associated departure Airport Operator and the Maximum Surface Hold can be provided by the departure tower. Both of these parameters can be set by time frame and by departure terminal. The Maximum Airborne Adjustment is estimated by the ATFM system considering the distance between the departure and arrival airports or remaining flying time for airborne flights.

4.26 The use of the Maximum Delay concept can be tailored for implementation based on the needs of individual ANSPs. The considerations for the use of Maximum Delay are presented in paragraphs 4.76 and 4.77.

Collaborative Decision-Making

4.27 Through the ATFM System, stakeholders will be given a broader view of system constraints that might affect their operation with enough lead time to create a plan of action. This increased situational awareness will facilitate stakeholder collaboration in deciding a course of actions.

4.28 Aircraft Operators are given the flexibility to manage their allocated ATFM delays in order to best meet their business objectives. Aircraft Operators will have the capability to substitute slots between any two flights that they operate. This can be done to reduce the delay of a high priority flight or move a delayed flight (e.g., mechanical delay, crew delay, or delay from a prior flight segment) into a slot that it can meet.

4.29 Aircraft Operators also have the ability to substitute flights into a later slot even if they don't have another flight that they operate to swap into the earlier slot. This is called an Inter-Operator Slot Exchange. The flight requesting a later slot submits the earliest time that it can operate and the system automatically selects one or more flights to move forward. Notifications are then sent to the Aircraft Operators that have flights which had their delay reduced, known as *bridged flights*.

Compliance

4.30 Non-exempt flights will be measured for compliance based on their allocated slot times versus actual time of operation. Medium and long-range flights which can absorb some delay in the air are measured for compliance with reference to the calculated time over (CTO) an arrival fix (AFIX). Short-haul flights that cannot efficiently absorb a significant amount of delay in the air may instead be measured for compliance with either their actual off-block time (AOBT) or actual take-off time (ATOT).

4.31 For ATFM measures relating to airspace demand and capacity balancing, compliance may be measured against the CTO at an en-route fix (RFIX).

4.32 Compliance is measured at a fix rather than at landing as flights have more control over meeting a fix crossing time prior to initiated tactical ATC sequencing into the arrival airport. ANSPs specify the fixes that are to be used both for ATFM measures and measuring compliance. Flights will attempt to arrive at this fix within a compliance window.

4.33 Exempt flights are not considered for compliance measurement. These exempt flights are determined by the FMP for a given program and could include flights outside a given radius, flights departing from certain airports, and special case flights, for example, very-very important person (VVIP) flights. These flights will be assigned a slot time, which may involve some delay, but the flights will not be expected to comply with their assigned delay.

4.34 Where an exempted flight is not allocated with a tactical departure slot time, the compliance to strategically approved departure time needs to be measured, in order to avoid over demand.

4.35 Additionally, flights will be filtered from compliance consideration in cases where the Aircraft Operator is not at fault. For example, if the pilot does everything in their control to meet assigned slot times yet the flight arrives early or late due to an ATC constraint, then the flight will not be considered non-compliant.

4.36 ANSPs have the flexibility to develop their own policy and procedures for the handling of non-compliant flights. The considerations for the alternatives are explained in paragraphs 4.71 to 4.75.

4.37 Measuring and sharing of compliance statistics must be part of every implementation of the Regional ATFM concept and shall ensure access to all authorized stakeholders.

4.38 An agreed view of the compliance data needs to be availed to the general public to ensure the transparency of the entire process.

<u>Post-Operations Analysis</u>

4.39 A key component of the ATFM system as a data-sharing platform is the analysis capability enabled to study the effectiveness of ATFM programs and ATFM Measures applied and to establish trends over time. Post-operational analysis is indispensable for the FMPs to improve the parameters in the ATFM measures to achieve the desired outcome. The results of these analyses can be shared among FMPs in the region and “best practices” can be established.

4.40 A proposed metrics used for post operations analysis are listed in the tables below. **Table 1** lists the general scenario metrics, which are used to measure the severity of events that occurred, the ATFM measure parameters selected to resolve the issues, and the impact of the ATFM measure on stakeholders during a given time period. **Table 2** lists the CDM action metrics, which are used to determine how active the Aircraft Operators were in managing their flights.

Metric	Description	Type
Number of Flights	The total number of flights that received calculated times	ATFM measure
Start/Stop Time	The Start and End time of the ATFM measure. The time period when the FMP wanted to control the demand	ATFM measure
Lead Time	The number of minutes the ATFM measure was implemented before the Start Time	ATFM measure

Number of Exempt/ Non-Exempt flights	The number of flights that were exempt from the ATFM measure to the number of non-exempted according to the parameters specified by FMP (percentage)	ATFM measure
Number of ATFM measure Events	The number of FMP actions that reassigned flights in the ATFM measure (i.e. number of revisions and compressions)	Operational Activity
Total Assigned Delay	The sum of the delay assigned by the ATFM measure	Operational Impact
Max/Average Assigned Delay	The maximum and average delay	Operational Impact
Total Gate/Surface/Airborne Delay	The total actual delay taken at the gate, on the airport surface, and in the air	Operational Impact
Number of Cancellations	The number of flights canceled and were part of a given ATFM measure	Operational Impact
Number of Unexpected Flights	The number of flights that appeared after the ATFM measure was already implemented	Operational Impact
Compliance to the assigned times	Percentage of flights complying to assigned departure/fix times	Operational Impact
Utilization of capacity	Percentage of the count difference between the planned flights and the actual flights	Operational Impact
Details of exempted flights	Full details of exempted flights to avoid misuse of this arrangement	Operational Impact
Delay savings	Difference between potential (theoretical) delay and actual delay	Operational Impact
Fuel savings	Fuel savings derived from the delay savings	Operational Impact
Emission savings	Emission savings derived from the fuel savings	Operational Impact

Table 1: General Scenario Metrics

Metric	Description
Number of Evaluations	Total number of CDM stakeholders participation organized before implementation an ATFM measure.
Number of Substitutions	Total number of flights that were substituted
Number of Inter-Operator Slot Exchanges (ISEs)	Total number of ISEs
Number of Bridged Flights	The number of flights that were bridged
Number of Cancellations	Total number of canceled flights for a given time period
Substitution Savings	The amount of the savings in minutes of flights that move forward as a result of a substitution
Bridging Savings	The amount of the savings in minutes of flights that move forward as a result of being bridged

Metric	Description
Number of Delay Modifications	Number of modifications made by the Aircraft Operator to their flight event times to show flight would be delayed
Number of Delay Intent Modifications	Number of modifications made by the Aircraft Operator to their delay intent values
Number of technical support	Number of operational/technical support provided by the FMP for an any other stakeholder to meet an ad hoc operational needs

Table 2: CDM Action Metrics

4.41 Compliance metrics are useful for reviewing the effectiveness of an ATFM measure and identifying systemic hindrances. There are many ways that users can view compliance metrics. For example, in **Figure 6** compliance is compared at various points in flight progress. The different colors in the pie chart show different levels of compliance, where orange and red are different degrees of late and blue and dark blue are different degrees of early.

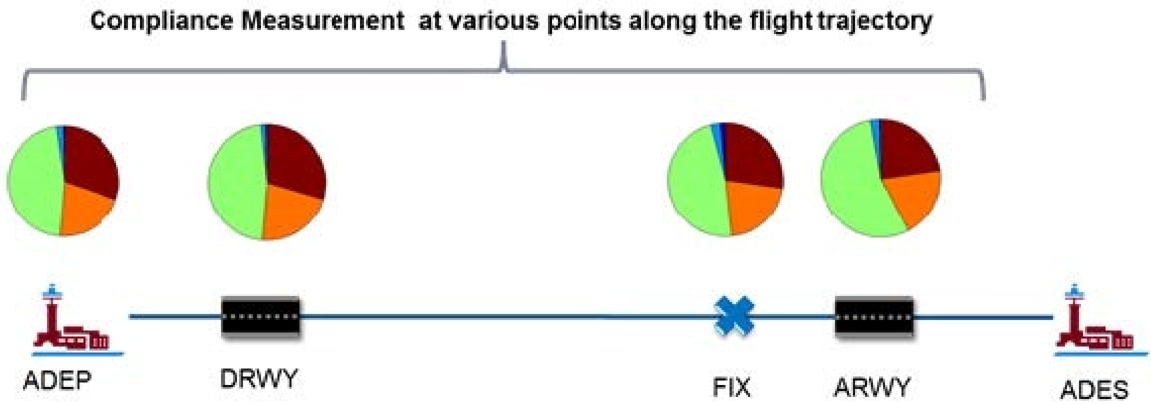

Figure 6: Compliance Metrics

Stakeholder Roles and Responsibilities

4.42 With the exception of the FMP, Regional ATFM stakeholders are the same as in the flight and ATM operations, but with added roles. First of all, stakeholders will collaborate on a daily basis in order to ensure the smoothest operations. This communication is done by sharing data with the ATFM System as well as during virtual/teleconferences organized by the FMP or any stakeholder. This communication will lead to a common view of the most accurate demand and resource capacities. When multiple ANSPs have implemented this concept, the virtual/teleconferences may exist at one or more levels of stakeholder participation to provide the necessary information to all stakeholders in the Region.

4.43 In addition to increased communication among the stakeholders, each stakeholder group has specific changes that result from the concept, described as follows:

Flow Management Position

4.44 Upon implementation of Regional ATFM, an FMP will need to be established within each ANSP. FMPs will be part of a flow management unit that is responsible for managing the operation of the ATFM system and the associated CDM processes within the ANSP.

4.45 The main responsibility of the FMP is to monitor the demand by viewing flight data from the ATFM System and comparing that to the arrival capacity of the airport(s) in their jurisdiction. The FMP collaborates with relevant stakeholders to update the capacity (i.e. AAR) when there is a constraint such as predicted weather or resource maintenance/outage. Whenever the predicted demand exceeds the capacity, the FMP shall organize CDM stakeholder's virtual/teleconferences to determine the best solution for the problem, which will likely involve implementing an ATFM measure. The FMP will have the ability to model various initiatives to smooth the imbalance and, in coordination with local stakeholders, select the solution that suits the best to meet the operational objectives set by the CDM stakeholders. Additionally, if multiple ANSPs in the region have an ATFM system, the FMP may coordinate with FMPs of other ANSPs to establish the best regional solution taking all the regional requirements into consideration. While ANSPs may have different ATFM systems, they will transmit and receive data in a common way, thereby enabling all regional FMPs to share the same operational information.

4.46 Once the ATFM program is running, the FMP will monitor the performance of the program. The FMP has the ability to revise a program if any of the parameters need to be changed. The FMP also has the ability to perform a compression (optimizing slot allocation) on a program to reassign flights to slots and to fill in any empty slots. Both of these actions involve having new slot times assigned and sent to the Aircraft Operators; therefore, these FMP actions are limited to operational need based on updated flight data or capacity information.

4.47 The FMP will also be responsible for organizing scheduled and ad-hoc virtual/teleconferences. Scheduled teleconferences will be held on a regular basis as agreed by the CDM stakeholders. The daily airspace plan will be discussed and could include: demand anticipated during the day, weather forecasts and constraints, resource availability/non-availability, any degradation of the ATS or its supporting services provisions, special use of airspace, Aircraft Operator operations, proposed ATFM measures modeling and implementation, and post-event analysis. Ad-hoc virtual/teleconferences can also be held should circumstances dictate a need.

Aircraft Operators

4.48 Aircraft Operators will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.49 Aircraft Operators will see changes in the way they manage their flights due to the redistribution of inevitable delay. When a demand and capacity imbalance is predicted, an ATFM program will shift the delay from the more costly airborne holding delay to the more efficient ground delay or airborne adjustment. Both the Flight Operations Center (FOC) and pilot need to be aware of the assigned ATFM measure and work to comply with it in order for the concept to be effective and equitable.

4.50 An additional role of the Aircraft Operator is to provide the demand inputs into the ATFM System in the pre-tactical and tactical time frame. These data could include flight schedule uploads and flight plans. As the time to operate the flight approaches, the Aircraft Operator can update flights' EOBT (e.g. flights delayed due to technical issue) through the ATFM System, making the changes visible to all stakeholders.

Note: Delay information input to the ATFM system does not replace the aircraft operator or pilot-in-command obligation to file delay, amendment, or cancellation and new FPL information, as specified in ICAO Doc 4444 PANS-ATM and State AIP.

4.51 When an ATFM program is implemented, Aircraft Operators have the flexibility to prioritize flights within the pool of slots they have been assigned and to specify the intended delay distribution for their flights. The FOC will communicate this delay intent to pilots and the flights will be measured for compliance with the slot times, as described in paragraphs 4.71 to 4.75.

Airport Operators – Departure Airports

4.52 Airport Operators will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.53 Airport Operators will be impacted by implementation of a ATFM measures as a departure flight may elect to take ground delay at the gate or between pushback and departure (Airport surface delay), which affects gate allocations and movement area and apron and taxiway usage. The Airport Operators' main involvement in the regional concept is to coordinate with Aircraft Operators for absorbing delay on the ground whenever necessary.

4.54 Where airport terminal (gate) capacity is constrained, Airport Operators may submit Maximum Gate Delay values to the ATFM system, as described in paragraphs 4.24 to 4.26.

Airport Operators – Arrival Airports

4.55 Airport Operators will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.56 Airport Operators will be responsible for advising the FMP on capacity constraints predicted at the airport. They will be expected to participate in scheduled and ad-hoc teleconferences. The Airport Operator will advise the FMP should the ATFM measures have an adverse effect on operations at the monitored airport.

Airport Collaborative Decision Making (A-CDM) Interface

4.57 A-CDM systems should interface with the ATFM system, using the Regionally agreed terminologies relevant to both ATFM and A-CDM; CTOT and calculated landing time (CLDT).

ATC – Departure Tower

4.58 The ATC Tower will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.59 The Tower ATC can facilitate compliance with ground delay intent as far as operational constraints allow. With access to the flight-specific intended takeoff time, Tower ATC officers can assist flights to have a compliant departure.

4.60 In addition, the Departure Tower ATC can coordinate where to best place the aircraft on the movement area in order to absorb the ground portion of the delay, without affecting the other aircraft movements.

4.61 Lastly, the Tower can submit Maximum Surface Delay values to the ATFM system, as described in paragraphs 4.24 to 4.26. The ATFM system should flag Maximum Surface Delay values input by ATC to identify where ATC or airport surface capacity constraint results in non-compliance with an ATFM measure.

ATC – Arrival Tower

4.62 The ATC Tower will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.63 The ATC Tower supervisor will be required to keep the FMP advised of constraining events at the airport. The Tower supervisor will be required to participate in teleconferences so as to add to the pre-tactical and tactical CDM processes. In addition, the tower supervisor will be required to tactically determine the AAR and advise the FMP if any change in the AAR is required.

ATC – Approach Control Unit (APP)

4.64 The ATC Approach Control Unit (APP) will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.65 Approach Control Unit (APP) will have no requirement to change their operational procedures to accommodate flights subject to an ATFM measure. Pilots may request an altitude or speed change in order to comply with their delay intent distribution. The ATC will follow normal ATC operating procedures before approving these changes. Education on the fundamental principles of the Regional ATFM concept will serve to increase controllers' awareness.

4.66 Terminal Area (TMA) ATC units in certain implementations of ATFM may have the authority to de-prioritize non-compliant flights. This model can be adopted but requires compliance status of flights being available to ATC. Adding this function to the terminal ATC depends on the ANSP's decision made in terms of compliance handling described in paragraphs 4.71 to 4.75.

ATC – Area Control Centre (ACC)

4.67 The ATC Area Control Centre (ACC) will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.68 En-route ATC units and centers will have no requirement to change their operational procedures to accommodate flights subject to an ATFM measure. Pilots may request an altitude or speed change in order to comply with their delay intent distribution. The ATC will follow normal ATC operating procedures before approving these changes. Education on the fundamental principles of the Regional ATFM concept will serve to increase controllers' awareness.

4.69 Terminal Area (TMA) ATC units in certain implementations of ATFM may have the authority to de-prioritize non-compliant flights. This model can be adopted but requires compliance status of flights being available to ATC. Adding this function to the terminal ATC depends on the ANSP's decision made in terms of compliance handling described in paragraphs 4.71 to 4.75.

Proposed Changes Resulting from Implementation

4.70 The following Technology and Policy changes supporting the implementation of the Regional ATFM Concept are proposed.

Technology Changes

4.71 Stakeholders will be able to perform demand and capacity balancing during the pre-tactical and tactical phases with the ATFM system. Through this system the FMP can model ATFM programs with participation of CDM stakeholders and with various parameter values to optimize the solution. When the ATFM measure is acceptable to the CDM stakeholders, then the ATFM measure runs and the slot times are automatically calculated and sent to the appropriate Aircraft Operators as well as shared with all stakeholders using a common platform such as a web interface.

4.72 Common situational awareness for all the stakeholders is essential for implementing effective ATFM measures; the ATFM system will bring this situational awareness to ANSPs, Aircraft Operators, Airport Operators, and other stakeholders. The ATFM system will integrate various data sources with the most accurate and up-to-date operational information. Users can connect to the ATFM system to view pertinent information as well as update any changes to their operations. Efficient sharing of more accurate data leads to better decision making in a timely manner. A CDM platform is required where Aircraft Operators are able to carry out advanced CDM processes to optimize schedules.

4.73 Users will be able to access stored data for post-operation analysis. Stakeholders will be able to view metrics for any previous day of operations (for a list of metrics, refer to paragraph 4.37 Tables 1 and 2). Statistical analysis of post operations data will help identify shortfalls in operations and methods to improve operations.

Policy Changes

4.74 Policy changes associated with Regional ATFM include involvement in teleconferences, which will increase information sharing compared with current-day operations. CDM stakeholders may participate in scheduled teleconferences to discuss the plan for the day as well as to review operations on the previous day. The stakeholders calling into the scheduled teleconferences include the FMP, Aircraft Operators, neighboring ANSP facilities, the ATC tower(s), and the local Airport Operator. If necessary, the FMP will coordinate with the FMPs of other regional ANSPs in a separate teleconference. The FMP may also convene and chair ad-hoc teleconferences to handle unforeseen demand and capacity imbalances.

4.75 Policy in terms of data sharing will have to change with the implementation of ATFM since sharing of data is the foundation of CDM. Aircraft Operators will have the ability to view delay metrics associated with their flights as well as aggregate metrics for all flights. ATC stakeholders will have unlimited situational awareness with regard to slot assignments. Access, security, and data integrity must all be addressed in single ATFM System instances and in the connectivity and data sharing between multiple ATFM System instances.

4.76 Aircraft Operators and third-party agencies generally measure on-time performance (OTP) by comparing flights' actual off-block times (AOBT) with their scheduled off-block times (SOBT). With the implementation of ATFM, the policy for measuring OTP should consider flights impacted by an ATFM measure. For these flights, on-time performance should be determined by comparing flights' actual off-block times and actual landing times with their intended off-block times. This is a challenge for ATFM systems since Aircraft Operator on-time performance is often defined by legislative action. To date, the impact of an ATFM initiative on a departure OTP metric has not been formalized.

Justification for Changes

4.77 Table 3 summarizes the major changes resulting from the Concept, and their justifications.

Change	Justification
Introduce a Flow Management Position	• A smoother transition of strategic demand and capacity balancing to pre-tactical and tactical demand and capacity balancing • A means of evaluating proposed ATFM measures in collaboration with the stakeholders prior to implementation • A communication position within the ANSP to keep stakeholders apprised of the operational conditions
Assign slot times to flights to manage demand-capacity imbalances	• Reduced fuel burn / emissions • Reduced controller workload • Increased predictability of operations • Enhanced safety due to reduced congestion
Aircraft Operators share flight data with ATFM system	• Accurate and common picture of demand
FMP specifies capacity	• Accurate and common picture of capacity
Aircraft Operators specify delay absorption intent	• Increased participation improves ATFM measure effectiveness and results in a more equitable delay assignment • Increased flexibility for Aircraft Operators to manage flights

Change	Justification
	• Reduced risk of absorbing unrecoverable delay
International and airborne flights participate in ATFM measures	• Increased participation improves ATFM measure effectiveness and results in a more equitable delay assignment
Aircraft Operators have the ability to substitute flight slots	• Flexibility for Aircraft Operators to manage flights based on their business models
Airport Operators and ATC Tower specify Maximum Ground Hold	• Increased situational awareness - Aircraft Operators: aware of flights which may have received more delay than they can absorb - FMP: more accurate picture of when flights will actually arrive at the terminal area
Measure compliance at a fix prior to landing	• Ensure a smooth flow of traffic to the constrained airport • Move Aircraft Operator compliance point beyond tactical terminal control area.
Post-Operations Reporting	• Provide a means to discover ways to improve operations
Teleconferences	• Increased situational awareness • Operational data exchange

Table 3: Changes and their Justifications Arising from the Concept

Impacts During Deployment

4.78 The participation of stakeholders has contributed to the development of the concept of operations; this participation will need to continue for successful operational deployments. This participation would include:

- Participation in stakeholder meetings establishing business rules specific to an ANSP's implementation;
- Development of operational procedures;
- Training of staff;
- Participate/organize operational daily and ad-hoc virtual/teleconferences; and
- Active participation in data sharing and ATFM measure execution.

Multi-Nodal Concept

The Regional ATFM concept has been described in the above from the perspective of a single ANSP. The concept readily applies to multiple ANSPs in the same region all implementing this form of ATFM/CDM. A key to the concept is that each ANSP would be responsible for implementing ATFM programs to airports and airspace within their area of responsibility according to the concept illustrated in this document. Information sharing between the ATFM systems would allow the users from any of the systems to have access to network-wide information. This includes Aircraft Operator access to controlled flights arriving at airports within the areas of responsibility of multiple ANSPs, and Air Traffic Control Tower access to ATFM information on departure flights bound to airspace and airports within the areas of responsibility of multiple ANSPs with CTOT and CTO reflecting delay intent from their respective ATFM measures. Details of the concept and procedures could be customized in each ANSP based on their individual operational requirements, but it is strongly recommended to keep the concept as consistent as possible across the region. Refer to paragraphs 4.70 to 4.78 for the details that can be adapted. **Figure 7** provides an example of the networked ATFM nodes under the MID Regional ATFM concept.

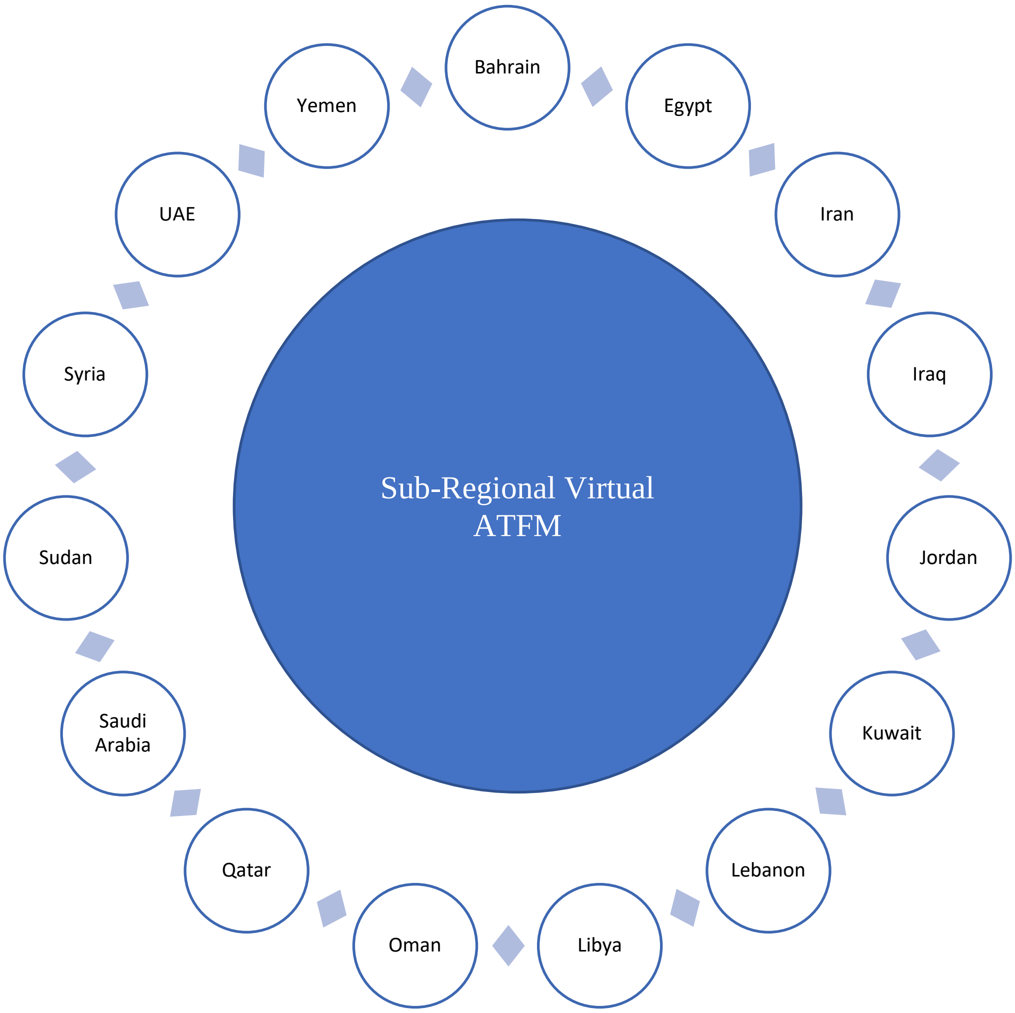

Figure 7: Distributed Multi-nodal ATFM Network

Implementation Considerations

4.79 The following concept elements can be addressed to meet the needs of a specific ANSP. The variations on the elements are described below to provide the full breadth of the concept without indicating a preference for a specific implementation.

Compliance Handling

4.80 High levels of compliance are critical for ATFM measures to have a predictable and efficient flow of traffic. Non-compliant flights could cause bunching in the arrival flow, requiring ATC to impose airborne holding or other tactical interventions on compliant flights. Non-compliance could consequently result in loss of trust among Aircraft Operators in the efficiency and equity of the Concept.

4.81 In current ATFM implementations, ANSPs have developed a range of procedures for preventing non-compliance. The options, together with their advantages and disadvantages are presented below along with their advantages and disadvantages. Note that the options are not mutually exclusive.

- Sharing of compliance statistics with stakeholders
  - Advantages
    - Promotes CDM principles through the transparency of data;
    - Aircraft Operators will strive for high compliance to maintain/improve the airline's reputation;
    - Flights that are unable to absorb delay (e.g. VVIP flights and emergencies) will not be penalized for non-compliance.
  - Disadvantages
    - No direct consequences for non-compliance
- Departure ATC prevents pushbacks or departures if flights will be non-compliant with their assigned CTOTs
  - Advantages
    - Little if any non-compliance with CTOTs
  - Disadvantages
    - Increased workload for ground movement controllers
    - Operational challenges associated with pilots absorbing delay at a holding pad
    - No penalty for non-compliance with intended airborne delay
- Deprioritize non-compliant flights in the arrival airspace
  - Advantages
    - Equitable amounts of delay taken for compliant and non-compliant flights
    - Compliant flights are not penalized when other flights are non-compliant
  - Disadvantages
    - Technical and procedural challenges associated with integrating the ATFM system and AMAN
    - Increased workload for approach controllers

4.82 Tactically deprioritizing flights in the approach airspace would require the ANSP to define fixes outside of the approach area that would be used to measure the compliance. If the ANSP has an AMAN, it would be best to measure compliance prior to the AMAN handoff point. This would ensure smooth delivery of the flow into the AMAN, which would then be used to sequence flights to the runway. It would also provide sufficient time for a Flow Manager or supervisor to decide which flights to deprioritize if the ANSP decides to deprioritize non-compliant flights. Due to the unique geometry of the airspaces, the distance from the airport at which compliance is measured will be adapted to each ANSP.

4.83 The size of the window at which flights are considered compliant is dependent on implementation and stakeholder involvement. An asymmetric (e.g. -5, +10 minutes) window could be used because Aircraft Operators have more control over not arriving early than not arriving late. In other words, Aircraft Operators could be late due to a variety of reasons such as weather deviations or an ATC constraint. Pilots generally have enough control over the flight to prevent an early arrival.

4.84 Individual ANSPs in the region will set compliance standards within their areas of responsibility; however, a standard procedure for handling non-compliance is recommended in the region for operating consistency.

Performance Metrics and Post-Operational Analysis

4.85 The metrics for post-operation analysis described in paragraphs 4.37 to 4.39 should be applied to all the ANSPs in the region because they are metrics related to the broader Regional ATFM concept and not the specific implementations. The common set of metrics will help the international ATFM community develop a method for comparison with operations around the world. In addition to those metrics, the concept allows for ANSPs to develop their own metrics and statistics particular to their operations. Some possible metrics/statistics to consider are:

- Program Delivery – Shows how effective the ATFM measure was at balancing the capacity and demand. It compares the expected demand after the ATFM measure was implemented with the actual demand. This is useful in identifying periods of non-compliance.

- On-Time Performance Metrics – Typically ATFM only considers whether ATFM measures were successful in balancing demand with resource capacity. On-Time performance represents another aspect of national airspace operations that is a good indicator of efficiency and is directly tied with impacts to the passengers. It is important to track the impact on passengers because it gives an insight on whether ATFM measures were able to provide benefits to more passengers rather than more aircraft.

- Environmental Metrics – Shifting air delay to ground delay has a positive impact on the environment through emissions reduction. Fuel burn metrics could be developed to study and track positive impacts of implementing an ATFM measure. The metrics could also support achieving the environmental goals any government may have.

Additional metrics could delve deeper into airport and airspace operations. They would be useful in identifying root causes of inefficiencies that have been exposed by higher-level aggregate metrics.

Maximum Delay

4.86 The implementation of the Maximum Delay to flights will be determined by each ANSP. Three options are:

1. Added as a parameter for the Aircraft Operators to compare to assigned delay
2. Incorporated into FMP demand predictions
3. Maximum Delay is incorporated in slot assignment

4.87 The first use will help Aircraft Operators manage their flights by ensuring the assigned delay is not greater than the Maximum Delay via delay intent adjustments and substitutions. The second use will help the FMP determine the effectiveness of a modeled ATFM measure. For example, if many flights are receiving more delay than their Maximum Delays, the FMP could increase the participation to reduce the average delay of participating flights. Maximum Delay during slot assignment could limit the delay assigned to flights such that their assigned delay is less than or equal to their Maximum Delay. This approach is not recommended for initial implementation, because it requires very accurate calculations of Maximum Delay.

Future Considerations – Role of En-route ATC

4.88 **Role of En-Route ATC**: The Concept of Operations states that the FOC will communicate delays associated with ATFM measures to their pilots. If the pilot needs to absorb some delay in the air in order to be compliant, the pilot will request speed and altitude changes to ATC, and the controller will approve the request if possible. With this tactic, en-route ATC will operate under the same procedures used currently.

4.89 Increasing the involvement of en-route ATC is possible based on ANSP involvement, controller training, and the desire to be actively involved in supporting airborne adjustments. For example, the en-route ATC could be aware of controlled flights' calculated times and actively direct flights to ensure compliance. This involvement increases the workload of en-route controllers but increases the likelihood that flights are compliant with the ATFM assigned delays. Due to the required time to add this role and the large number of stakeholders impacted, this role is not considered for the current concept, but may be considered in the future.

5- Operational Scenario

5.1 The initial conditions for this scenario are illustrated in **Figure 8**. The FMP views the demand and capacity predictions at the arrival airport. The FMP sets the runway configuration and AAR after coordinating with the tower and terminal supervisors. The pre-tactical demand is lower than the nominal capacity, so there is no need for any arrival airport ATFM measures.

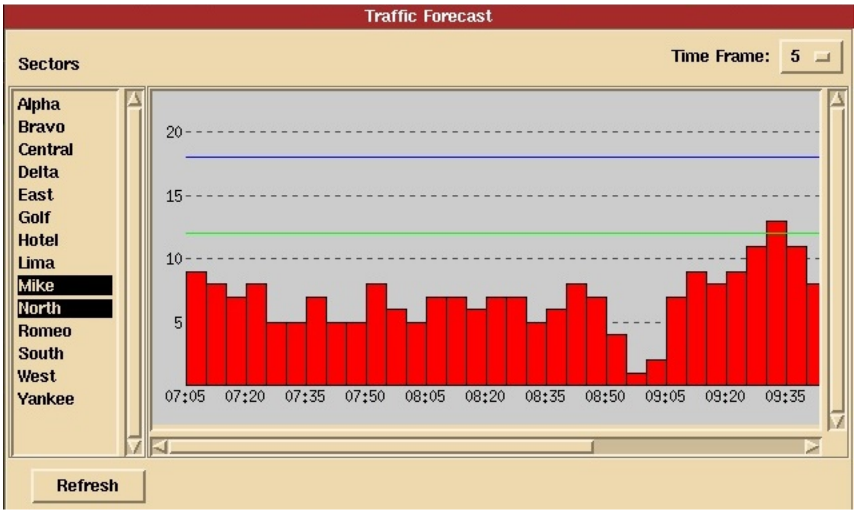

Figure 8: Demand and Capacity Prediction

5.2 At 0000 UTC, the military informs the FMP of a military exercise that will impact the operations at the airport. The reduced capacity will likely cause a demand and capacity imbalance, which can be managed by running an ATFM measure. The parameters for the ATFM measure are selected such that the capacity reducing event will have the least possible impact on all of the stakeholders. The result of the modeled ATFM measure is shown in **Figure 9**, with the parameters listed below:

- AAR based on the capacity reducing event: 25 between 0500 and 1100 UTC
- ATFM measure start time: 0500
- ATFM measure end time: 1100
  - Flights with estimated landing times between the start and time of the program will receive a slot, or Calculated Landing Time (CLDT), at the arrival airport.
- Non-exempt flights: 15 major airlines from the region
  - The major airlines will attempt to comply with their assigned slot times, regardless of their departure airport.
  - The few remaining flights from other airlines are exempt and will receive priority in slot assignments.
  - Exempt/Non-exempt status can also be set for specific airports and flights and based on distance.
- Active Flight Exemption Horizon: 1 hour
  - Airborne flights estimated to land within the next hour will be exempt from the program and receive priority in slot assignments because they will not be able to efficiently absorb any delay.

- Required Notification Time: 1 hour
  - The default intent for pre-departures that are estimated to depart within the next hour is to absorb all of their delay in the air because the FOCs require approximately one hour to notify pilots of the ATFM measure.

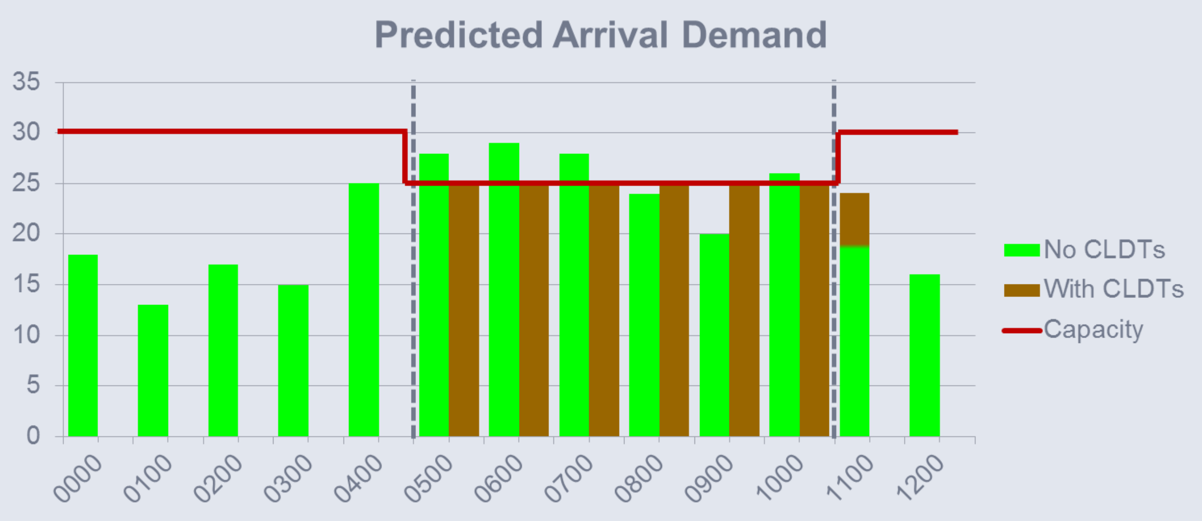

Figure 9: Modelled ATFM program

5.3 The FMP coordinates with CDM stakeholders via teleconference to coordinate the potential impact of implementing the ATFM measure. While all stakeholders can provide input on the program parameters and suggest alternative solutions, the FMP is the ultimate decision-maker.

5.4 The FMP runs the proposed ATFM measure, and slot assignments are sent to Aircraft Operators. The slot assignment event times are prefixed with the letter C for Calculated and include:

- Calculated Off-Block Time (COBT)
- Calculated Take-Off Time (CTOT)
- Calculated Time Over (CTO)
- Calculated Landing Time (CLDT) (arrival slot time)

5.5 Aircraft Operators have the flexibility to distribute the delay intent of pre-departure flights into three attributes: Intended Gate Delay, Intended Surface Delay and Intended Airborne Delay. In certain cases, Aircraft Operators will coordinate gate and surface delay intents with the Airport Operator to manage gate turnaround times and gate conflicts.

5.6 The Thai Airways FOC decides to absorb a portion of the assigned delay of flight THA641 in the air (**Figure 10**). Of the 20 minutes of the assigned delay, THA641 intends to absorb 10 minutes at the gate and 10 minutes in the air. The FOC submits the delay intent to the ATFM system via the web interface. The FOC then informs the pilot of the intended delay.

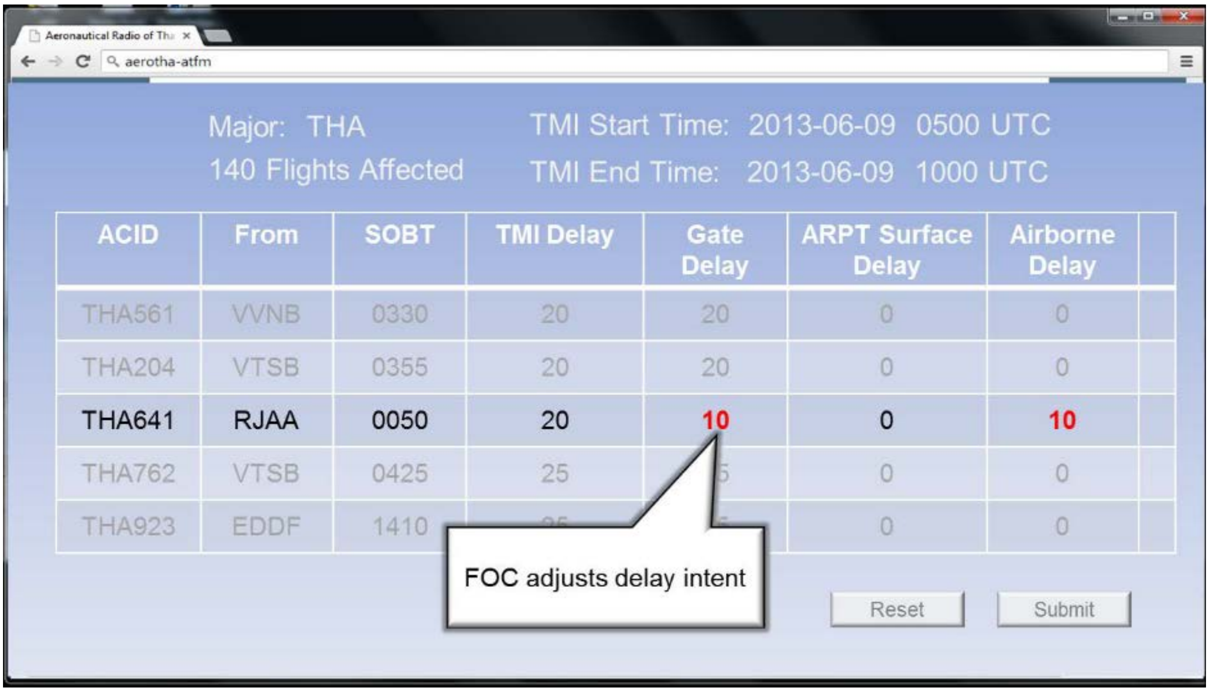

Figure 10: Delay Absorption Intent

5.7 The event times associated with the intended delay are prefixed with the letters "DL". For flights that intend to absorb some delay on the airport surface or the air, their DL Off-Block Time (DLOBT) and DL Take-Off Time (DLTOT) will be different from the Calculated "C" times associated with the slot. **Table 3** shows the updated DL-times for THA641 based on ten minutes of gate delay and ten minutes of airborne delay. Notice the DLOBT and DLTOT are both ten minutes earlier than the COBT and CTOT because the flight intends to make up that additional ten minutes delay in the air.

ACID	DLOBT	COBT	DLTOT	CTOT	DLLDT	CLDT
THA641	0100	0110	0110	0120	0600	0600

Table 3: the updated DL-times

5.8 Aircraft Operators also have the ability to substitute flight slots in order to meet their business objectives. For example, CPA713 is a high-priority flight, so the Cathay Pacific FOC substitutes it with CPA739. The CLDTs of the two flights are swapped and the CTOTs are recalculated based on the new slot times. The result of the substitution is shown in **Figure 11**.

Pre-Substitution

ACID	ADEP	CTOT	ATOT	SLDT	CLDT	TMI Delay
CPA739	VHHH	0345	----	0705	0710	5
CPA713	VTBS	0455	----	0710	0720	10

Post-Substitution

ACID	ADEP	CTOT	ATOT	SLDT	CLDT	TMI Delay
CPA739	VHHH	0355	----	0705	0720	15 (+10)
CPA713	VTBS	0445	----	0710	0710	0 (-10)

Figure 11: Pre- and Post- Flight Substitution

5.9 Pilots request pushback clearance at the departure airport at the Delayed Off-Block Time (DLOBT). Following the departure airport's procedures, flights receive clearance for pushback. At certain departure airports, procedures may be altered such that flights can only receive pushback approval if the request is within a compliance window.

5.10 Approach and en-route controllers will operate as they do in current operations and may have a basic understanding of the Regional ATFM concept. Flights that intend to absorb some delay in the air may request speed and or altitude changes en-route in order to meet the intent. The en-route controller may accept or reject the speed or altitude request based on ATC operational requirements.

5.11 Arriving flights will be measured for compliance at an AFIX prior to landing. If a flight's actual time over (ATO) the fix is within the compliance window of the flight's CTO for the fix, the flight will be considered compliant. In addition, flights that are late to the fix due to an ATC constraint will not be considered non-compliant.

6- Expected Benefits of the Concept

6.1 There are many expected benefits with the implementation of the Regional ATFM concept. The major areas of improvements upon the current procedures include:

- A smoother transition of demand and capacity balancing from strategic to pre-tactical and tactical phases of ATFM.
- Reduced fuel burn and emissions.
- Accurate and common view of demand and capacity predictions.
- A means of modeling and evaluating proposed ATFM measures in collaboration with the stakeholders prior to implementation.
- Flexibility for Aircraft Operators to optimize their schedules through a web-based CDM platform.
- Flexibility for flights to absorb inevitable delay on the ground or efficiently through the en-route portion of the flight rather than by holding in the terminal area.
- A more reliable data source of stakeholder intent—this applies to Aircraft Operators sharing how they intend to operate the flights, as well as ANSPs and airports sharing any resource constraints.
- Enhanced safety by ensuring safe traffic densities.
- A data platform that integrates various flight data sources and provides common situational awareness to the stakeholders.
- An environment in which ATFM measures and other operational procedures can be improved through post-operational trend analysis.

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Attachment A - ATFM Background

ATFM Measures

A.1. There are a wide variety of ATFM measures that resolve demand-capacity imbalances by shifting demand either spatially or temporally. These measures can be classified into the following three groups

- Spacing Restrictions—Require consecutive flights in a common flow to be separated by a specified time or distance.
  - Miles-in-Trail (MIT)
  - Minutes-in-Trail (MINIT)
  - Minimum Departure Intervals
- Rerouting: Shifts demand around a weather constraint to create a spatially balanced flow of traffic.
  - Fix balancing
  - Collaborative Trajectory Options Diversion of flows
  - Level capping (i.e. restricting the altitude of certain flight plans)
  - Re-route
- Ground Holding: Shifts predicted airborne holding delays to ground holding at the departure airport by controlling flights' departure times.
  - Ground Delay Program (GDP)
  - Ground Stop (GS)

Some actions that would be used to mitigate the impact of ATFM Measures:

A.2. Some measures can be taken by the Airspace User to mitigate the impact of a proposed ATFM measure based on their business model: slot swapping is the most commonly used method. Re-routings, even though they are ATFM measures, may also be used by Airspace User(s) to that end, when, for example, an Airspace User opts for a longer route or a speed reduction in order to avoid a congested area at a specific time. In all cases, such mitigations can only be chosen following an established CDM process.

A.3. Slot swapping can be applied either manually or via automated means. The ability to swap ATFM departure slots gives Airspace Users the possibility to change the order of departure of the flights that should fly in a constrained area. This action provides Airspace Users with the ability to manage and adapt their business model to a constrained environment.

A.4. Airborne holding may be complementary to ground delay programs and ground stops. Airspace Users may, in collaboration with the ANSP, choose to use this program to keep a small inventory of holding aircraft during periods of congestion, to maintain demand pressure on the approach. The supply of available aircraft can prevent losing opportunities when departure demand is not constant or when meteorological conditions vary. Airborne Holding, in general, is costlier than other methods, but Air Traffic Managers may plan for airborne holding when required delays are predicted to be low.

A.5. It is recognized that airborne holding is a last-resort measure, as in-flight holding places a hefty burden on both Airspace Users and ANSPs. In the event that the arrival of a given flow of traffic needs to be delayed, measures such as slowing aircraft well before the planned top of descent, and making use of the required time of arrival (RTA) have proven to be effective. Most of these techniques make good use of aircraft capabilities and usually reduce operating costs and environmental impacts without increasing the workload of the ATC.

ICAO Guidance on ATFM

A.6. The ICAO Doc 9971- *Manual on Collaborative Air Traffic Flow Management (ATFM)* provides recommendations for ATFM implementation. ATFM should be implemented in phases in order to build stakeholder knowledge as operations become more complex. It is also important for procedures to be developed in a harmonious manner among states in the region to reduce operational differences. ICAO also recommends three communication methods for information sharing: scheduled telephone or web conferences, tactical telephone conferences, and an automated web page or ATFM operational information system.

A.7. The list below is a summary of the ICAO document's suggested initial steps to implement ATFM:

- Establish objectives, project management plan, and oversight of ATFM
- Identify personnel who will lead the development of ATFM
- Brief stakeholder groups on ATFM principles
- Define the ATFM structure that will be established
- Consider the facilities and equipment that will need to be procured
- Develop a model for establishing AAR
- Identify points of contact for dealing with ATFM issues
- Define the elements of common situational awareness including: Meteorological information
- Traffic display tools
- Identify the appropriate means of ATFM communication
- Develop Letters of Agreement between adjacent FIRs
- Develop user manuals and training materials

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Attachment B - Participation Analysis – Changi Case Study

B.1. This following is a summary of an analysis conducted to determine a required participation level for effective implementation of ATFM measures.

B.2. A fast-time simulation was created to simulate the impact of various participation levels on ATFM measure effectiveness, using scheduled takeoff times were from Changi arrival data. The flight progress was simulated with GDPs implemented with various reduced capacities at two participation levels. 1400 NM and 2400 NM radii around Changi provide approximately 50% and 75% participation levels, respectively. The map in **Figure B1** shows the airports that are included in the two radii explored.

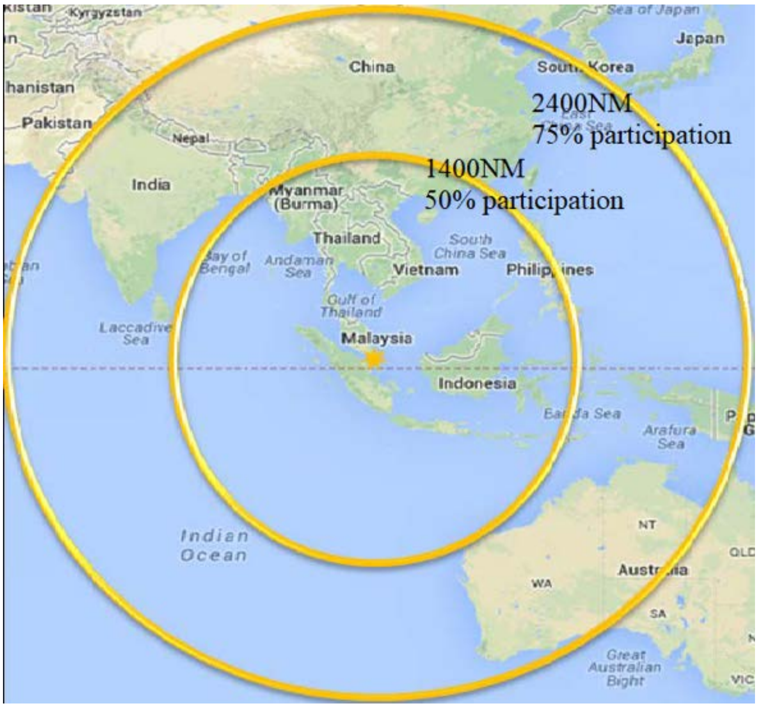


Figure B1: Airports within Participation Radius

B.3. The results for the two participation levels are compared in **Figure B2**. As indicated by the plots, the total delay increases exponentially as the capacity is reduced. In the severe case of a 16 flights/hour airport capacity (about half of the nominal arrival capacity), participating flights receive an average of 2.3 hours of delay when participation is 50% and about 1.6 hours of delay when participation is 75%. Therefore, increasing the participating flights reduces the delay per participating flight by 0.7 hours. The reason for this reduction is that there are fewer exempt flights that get priority in the slot assignment.

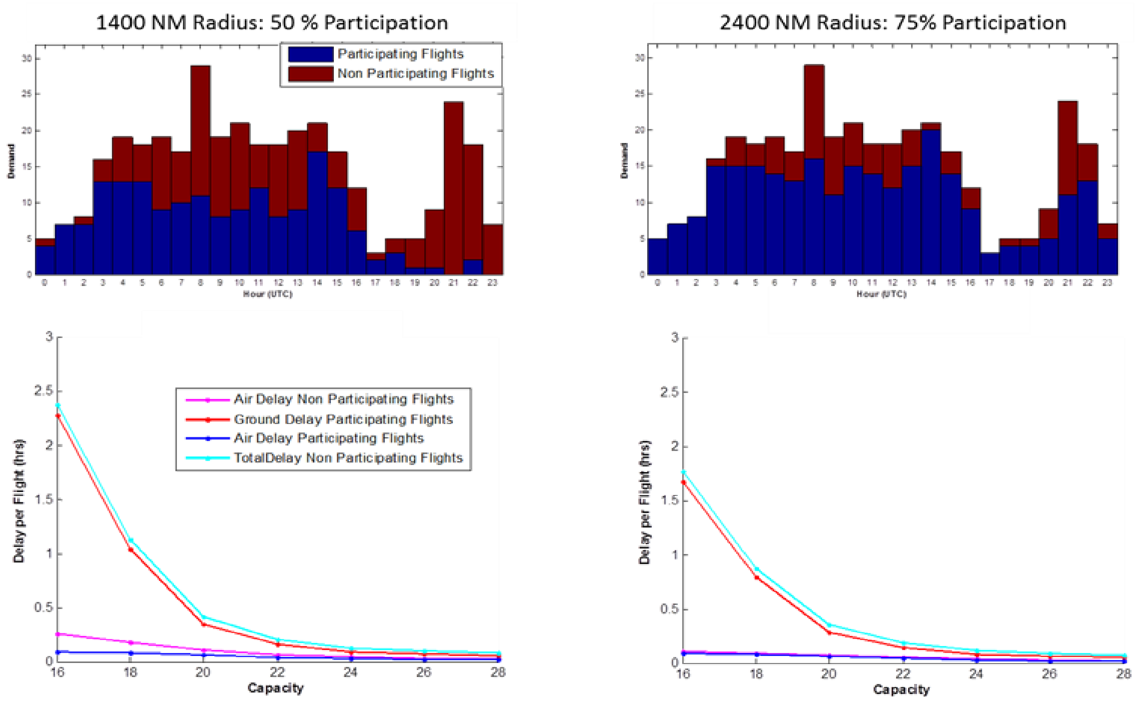


Figure B2: Participation Analysis

B.4. The delays for the non-participating flights are also reduced when the participation level is increased. In the example below, the airborne delay for non-participating flights is reduced from 0.3 hours to about 0 hours when increasing participation from 50% to 75%. This is because the demand of participating flights is generally lower than the capacity of 16 when the participation is 75%, whereas when the participation level is 50% there are a significant number of non-participating flights that need to be delayed in order to bring the total demand below capacity.

B.5. When the capacity reduction is less significant, the difference between the two participation levels is less pronounced. For example, when capacity is reduced to 20, the average delay for participating flights is reduced from 0.4 hours to 0.3 hours for 50% and 75% participation, respectively. The reason for this reduction in the difference between the two participation levels is due to the fewer flights that receive delay. As shown in **Figure B2**, the demand is below 20 for most of the day, meaning an ATFM measure is not needed for most of the day.

B.6. Based on these results and knowledge from currently implemented ATFM systems, high participation (>75%) is necessary to manage the flow of traffic during events with a relatively high reduction in capacity. If the capacity reducing event induces minor delays, the flow may be managed with less than 75% participation.

Table of Contents

PART III – MID ATFM Common Operating Procedure and Implementation Guidance

PART III

MID ATFM Common Operating Procedures and Implementation Guidance

1- Introduction

Executive Summary

1.1 The large growth of air traffic movements in the MID region in recent years has resulted in airport and airspace capacity that is inadequate to accommodate the ever increasing demand. The failure to balance demand and capacity has been exacerbated by airborne holding and excessive tactical Air Traffic Control (ATC) measures, which result in increased cockpit - ATC workload and airline sector times. In addition, adverse weather often reduces the capacity of airports and airspace, resulting in additional strain on the air navigation service providers (ANSPs).

1.2 Capacity growth should always be a priority and have ongoing focus by ANSPs and airports. ANSPs should carry out analysis of their operations to establish if ATFM/CDM is required and if required, which concept as described in this document should be implemented. Should a State not have requirements for ATFM, they are expected to support other States that are implementing ATFM/CDM by adhering to agreed region procedures. Cooperation and collaboration between all stakeholders in the region will ensure successful implementation of ATFM/CDM in the region, which will benefit all users by reducing airborne holding, increasing predictability, and providing greater operational flexibility.

Scope and Purpose of the ATFM common operating procedure and Implementation Guidance

1.3 The purpose of this part is to provide guidance to the ANSPs in the MID Region on ATFM/CDM implementation strategies, with particular emphasis on Cross-Border Regional ATFM/CDM. In addition to this, the part will support the Regional ATFM Framework to ensure synergies during implementation of ATFM in the region.

1.4 There is clear evidence that implementation of ATFM/CDM in other areas of the world has brought significant benefits to the aviation community. For ATFM/CDM to be effective in the MID region, Regional ATFM procedures and Cross-Border operations will be required due to the unique operational requirements of the region.

1.5 ATFM/CDM implementation is a complex task and this part is not the definitive manual on implementation; however, it is intended to serve as a guide for Cross-Border Regional ATFM implementation for MID region and should be read in conjunction with other relevant documentation on ATFM implementation.

1.6 The ICAO Doc. 9971 – Manual on Collaborative ATFM, together with the Regional ATFM ConOps (Part II) and the Regional ATFM Framework (Part I) guide ANSPs in the planning and implementation of interoperable cross-border ATFM. Regional ATFM ConOps details the ATFM concept for the Region, and the Regional ATFM Framework details the “what and when” of implementation. This part, provides additional guidance (the “how”) for states in the MID region and will assist ANSPs with both identifying and implementing the appropriate ATFM capability in their areas of responsibility. It is fully expected that this part will evolve as the Cross-Border Multi-Nodal ATFM concept further develops.

2- Understanding the impact of ATFM/CDM Implementation

2.1 ATFM is now entrenched in the ICAO ATM operational concept, the ICAO Aviation System Block Upgrade - Block 0 and Block 1 (ASBU B0/B1) and the ICAO MID Strategy Plan. Some ANSPs in the region have implemented ATFM/CDM these implementations have had significant positive impact on operations resulting in both qualitative and quantitative benefits.

2.2 For ATFM to have a sustained impact, the cooperation of the majority of stakeholders is required. Stakeholders' participation in ATFM includes activities such as ANSPs being required to respect ATFM measures applied in other Flight Information Regions (FIRs) that will affect operations in their own areas of responsibility, Aircraft Operators having to manage assigned delay by either taking ground delay or providing en-route delay intent to comply with delays imposed, and Airport Operators accommodating flights being delayed at departure airports. While ATFM requires the various user groups to actively participate in ATFM measures, the additional workload ultimately provides network benefits.

2.3 When increased ATFM measures are introduced in the MID region, whether domestically or Cross-Border, stakeholder education, interaction and consultation are necessary to ensure impacts, goals and overall network benefits are well identified and understood.

2.4 ATFM/CDM implementation will require new or changed working procedures, and a good understanding and application of these procedures will be required by all stakeholders for ATFM/CDM to be successful. It is essential that a collaborative approach is taken when agreeing new work practices and ensuring comprehensive communications and training is delivered to all stakeholders.

Cultural change

2.5 ATFM/CDM implementation requires a significant culture change in all stakeholder organizations. This culture change is required at all levels within organizations. In previous ATFM/CDM implementations, when a culture change was embraced at executive and senior management levels, the change has been effective. A change management process needs to be executed to ensure the culture change occurs. In particular, operational staff (ATCOs and pilots) are often reluctant to accept the change to a structured ATFM environment. It is essential that these groups are fully engaged and supportive of ATFM and special attention should be given to their training and education. This aspect of implementation should not be under-estimated and can be managed by education and effective change-management programs.

3- **Setting up an ATFM/CDM Project**

Requirement assessment and gap analysis assessment

3.1 ANSPs should perform an analysis of ATM operations to determine whether ATFM is required in their environment and if so, the scope of ATFM implementation, capacity enhancement initiatives must be considered in conjunction with any assessment of the requirement for ATFM. The operational requirements assessment should determine the scope of ATFM implementation; either Domestic ATFM or Cross-Border ATFM as detailed in the Regional ATFM Framework. This assessment can be carried out internally or by an external experienced agency. Once the scope of ATFM is identified, a gap analysis needs to be carried out to identify the existing baseline, technical capabilities, and implementation requirements for the State concerned.

General ATFM/CDM implementation process

3.2 A general process for ATFM/CDM implementation is presented in Figure 1. It shows the implementation process of ATFM/CDM, whether it be Domestic or Cross-Border Regional ATFM/CDM. The process commences with an interest in implementing ATFM/CDM from the Strategic phase to Post-Operational analysis with the entire process being regularly re-evaluated as requirements change. During the entire process there is continued stakeholder participation. A Cost Benefit Analysis (CBA) is not indicated; however, it should be performed.

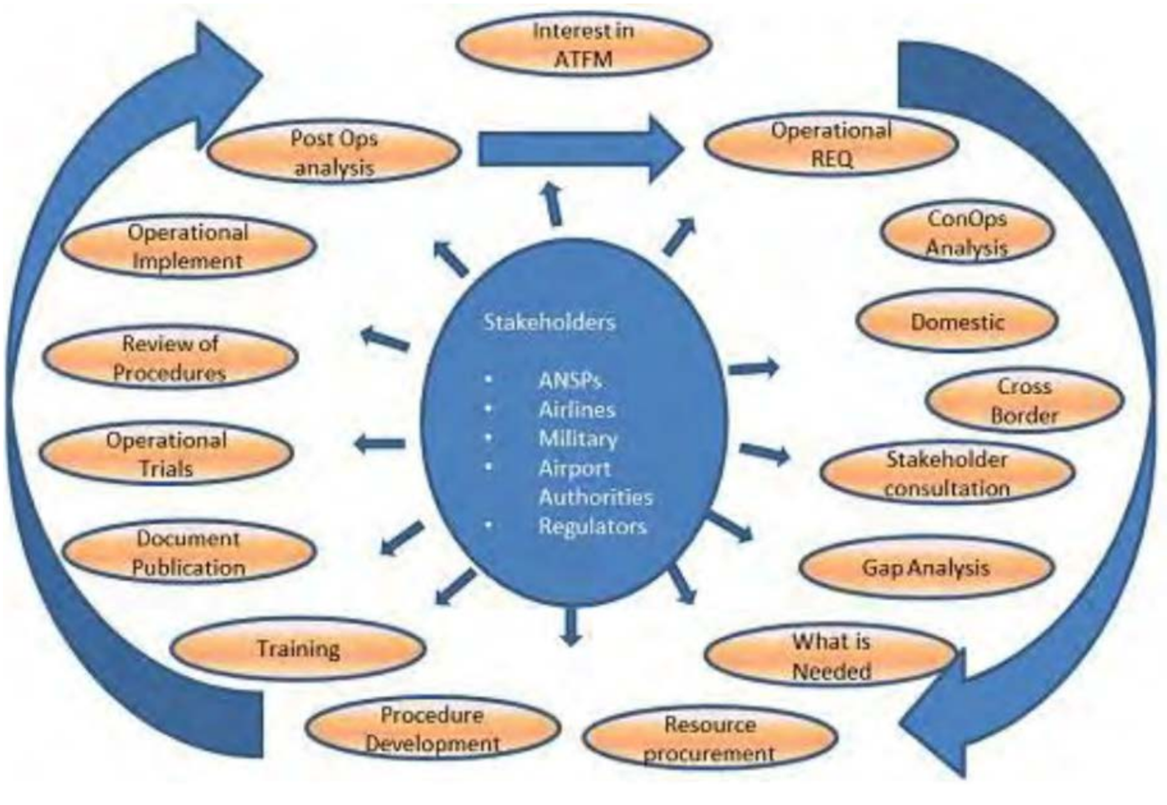


Figure 1: Typical ATFM/CDM process Educating and convincing all stakeholders

Educating and convincing all stakeholders

3.3 Most stakeholders will realise the value and benefits of ATFM/CDM implementation; however, previous implementations have shown that some stakeholders require education and to be convinced of benefits before completely accepting and becoming part of the implementation process. Programs need to be developed to educate all levels in stakeholder organisations, from operational staff to executive management. These programs could include workshops, seminars, etc. Printed and electronic media is also a valuable vehicle in educating stakeholders.

3.4 Experience shows it is imperative to get executive and senior management support. It is important to identify the correct stakeholders from the beginning of ATFM/CDM implementation and include them from the outset of ATFM/CDM implementation. Stakeholders may include but may not be restricted to the following:

1. Flow Management Units (FMUs);
2. Aircraft Operators – airlines, military, police, business aviation and general aviation;
3. Pilots;
4. Air Traffic Control (ATC) units;
5. Airport authorities;
6. Adjoining ANSPs; and
7. Regulatory bodies.

Role of stakeholders

3.5 Stakeholders have distinct roles in ATFM/CDM. The following sections provide a high level (i.e., non-exhaustive) description of their roles.

FMUs

– Daily Airport and Airspace Capacity determination

  o Demand Prediction – Flight progress is via manual input or automated data feed (e.g., ATM Automation System Flight Data Processor [FDP] or Aeronautical Fixed Telecommunications Network [AFTN])

– Capacity Management – Inputs from Flow Management Position (FMP) and Flight Operation Centre [FOC] are via ATFM web-based interface

– Assess effects of imbalance to traffic beyond capacity impact range

– Stakeholder CDM engagement

– Model Flow programs and set hourly capacity and arrival slots to ensure demand/capacity balance

– Slot assignments can be viewed via software web interface and notifications.

– Monitor effectiveness of ATFM measure and amend as required

– Provide daily post-operational analysis

Aircraft Operators

– Participate in CDM process (Telecons)

– Supplying flight updates via ATS methods or through CDM processes

– Monitor flight progress for compliance

- Manage flight delay intent and substitute flights if necessary

Pilots

- Follow ATC operational procedures when trying to achieve compliance by meeting intended delay absorption
- Communicate potential non-compliance

ATC

- Departure Airports – Monitor compliance with Calculated Take-Off Times (CTOTs)
- En-route – Aware of ATFM Measures but minimal interventions required
- Arrival phase of flight – Assist with compliance with Calculated Time Over Fix

Airport Operators

- Departure Airports – Respect ATFM-measure-affected departures and assist in meeting departure times based on Airport capacity
- Declare daily maximum allowable delay at gates

Adjoining ANSPs

- Reach agreement on Cross-Border operational procedures
- Write and sign LOAs – (ATFM LOA Templates is in Part I, Appendix H)

Regulators

- Coordinate with appropriate government body to ensure legislation supporting ICAO Document Annex 11 (Section 3.7.5, a and b) “develop and publish regulations applicable to all ATFM/CDM stakeholders, responding to this legislation.”
- Ensure publication of ATFM procedures and information in the State Aeronautical Information Publication.

<u>Setting the objectives for ATFM/CDM Implementation</u>

3.6 All ATFM/CDM partners have the common objective of providing a safe expeditious flow of traffic to Airspace Users to ultimately benefit passengers and cargo movement. To achieve this main objective, there are many supporting objectives such as:

- Enhance Safety
- Reduce fuel burn
- Reduce carbon emissions
- Reduce ATC – Pilot workloads
- Increase situational awareness
- Improve predictability

– Optimise airspace and airport operations

3.7 In addition to the aforementioned objectives, Cross-Border Regional ATFM objectives include:

– Enable ATFM/CDM to be effectively implemented in States where there is insufficient domestic traffic

– Enable and apply ATFM measures to regional flights and across multiple FIRs

– Implement seamless ATFM across multiple FIRs

4- **Implementation**

Introduction

4.1 The ATFM baseline study indicated that all regional ANSPs, in accordance with ICAO requirements, have intentions of implementing ATFM; these initiatives vary from existing tactical ATFM measures to advanced strategic, pre-tactical, and tactical automated systems.

When should ATFM be implemented

4.2 ANSPs should have a plan for implementing ATFM, either domestically or regionally, depending on their requirement and level of maturity. Even though ANSPs may not have the operational requirement to implement ATFM domestically, they may be expected to participate in Cross-Border Regional Multi-Nodal ATFM by adhering to regionally accepted procedures, for example, ensuring that all flights subject to an ATFM measure comply with CTOT.

4.3 During the requirements analysis, ANSPs should ascertain when and in what form ATFM is required, and what trigger points need to be identified for implementation. For example, the trigger points could include when certain demand levels are reached which would allow the required lead time to implement the appropriate ATFM processes.

4.4 The level of an ATFM service required in each ANSP will depend on a number of factors as previously described. It is important to note that an ATFM service may be simple or complex depending on the requirements in an individual ANSPs area of responsibility. For successful implementation in the region it is important that all ATFM implementations are harmonized.

ATFM/CDM Requirements Analysis

4.5 ANSPs should perform an analysis of ATM operations to determine whether ATFM is required in their environment and if so, the scope of ATFM implementation. Factors which need to be taken into consideration during this assessment are as follows (note that this should not be construed as an exhaustive list):

- Whether demand exceeds capacity on a regular basis in either airspace or at airports.
- Whether there are periods of high workload on ATC followed by periods of minimal traffic.
- Whether there are initiatives to increase capacity that are in line with predicted demand.
- What is the anticipated growth in traffic movements and whether that demand will exceed resource capacity in the future.
- What are the military airspace and operational impacts on capacity of airspace.
- Whether there are significant increases in seasonal demand (Haj/holiday season) resulting in demand exceeding capacity.
- Whether airlines are experiencing increased sector times.
- Whether there are noise abatement procedures causing reduction in capacity.
- Whether there is excessive airborne holding, vectoring, speed control, and/or surface queuing.

- Whether there are capacity constraints (e.g., weather, very important person [VIP] movements, sporting events, military exercises, frequent equipage outages, political unrest, labor issues).
- Whether there are flights that depart from airfields within their area of jurisdiction to other FIRs where ATFM measures are in place.
- Participation in Cross-Border ATFM initiatives.
- What is the ratio of domestic traffic versus international and regional traffic.
- Whether there are multiple resources (airports or airspace) within the area of jurisdiction which require ATFM/CDM.
- What is the type and equipage of aircraft fleet.
- What are the Communication, Navigation, and Surveillance (CNS) capabilities of ANSP.
- Are major changes in CNS equipage changes likely to affect capacity during implementation.
- What are airport resources and processes (Airport Collaborative Decision Making [ACDM]).
- Once the requirements are identified a gap analysis needs to be carried out to establish the existing baseline, technical capabilities, and develop ATFM implementation requirements for the State concerned.

<u>ATFM/CDM CONOPS</u>

4.6 Once the ATFM/CDM implementation Requirements are established, State/ANSP will need to develop a CONOPS for its area of responsibility. The National CONOPS could be limited to one or be a combination the ATFM/CDM CONOPS described in the following sections.

<u>Domestic ATFM</u>

4.7 The State may have the required number of domestic flights to make Domestic ATFM effective without including regional and international flights. As previously stated, it has been calculated that a minimum of 70% participation of flights in an ATFM program such as a Ground Delay Program (GDP) is the minimum required to gain operational and efficiency benefits. In this chosen option, only domestic flights will be subjected to ATFM measures; regional and international flights may be exempt. While a State may have enough domestic flights for ATFM to be implemented, it is advisable that a concept including regional and international flights is considered to ensure the distribution of delay is fair, equitable, and efficient.

4.8 Examples of Domestic ATFM/CDM implementations (South Africa, Australia, and Japan); have all recognized the requirement to include regional and/or international flights in ATFM measures. South Africa is considering including flights from surrounding States, and Australia is planning to include long-range flights in its ATFM program. Japan is part of the North Asia Regional ATFM Harmonization Group (NARAHG) regional group which is considering how to develop Cross Border ATFM/CDM in this sub region.

4.9 In MID, States/ANSPs may initially implement Domestic ATFM/CDM; however, long-term plans should be to "upgrade" to Cross-Border Regional ATFM.

Key components of the Domestic ATFM/CDM concept.

- System Capability and functionality
    - ANSP independently manages demand/capacity of its own Airport(s).
    - Only domestic traffic is subject to ATFM measures.
    - Stakeholders/ANSPs communicate via Internet/Telecom networks.
    - CDM is performed by stakeholders via software web interfaces.
- Specify Capacity and Predict Demand
    - Demand Prediction – Flight progress is via manual input or automated data feed (e.g., FDP or AFTN).
    - Capacity Management – Inputs from FMP and FOC are via ATFM web-based interface.
- Evaluate Alternatives, Initiate/Modify ATFM Measures
    - Domestic Aircraft Operators manage the ATFM Measure delay assigned to flights.
    - Slot assignments can be viewed via software web interface and notifications.

Cross Border Regional ATFM/CDM

4.10 While it is not envisaged any state will implement a Cross Border Regional ATFM/CDM CONOPS in isolation, the Cross Border Regional ATFM/CDM CONOPS is explained for understanding.

4.11 A State/ANSP implements and operates a single independent ATFM/CDM system applicable to their environment which would comprise a single ATFM entity employing concepts as described in the Regional ATFM CONOPS. Implementation of this concept does not require a “Node” and can be implemented by an ANSP that implements an ATFM measure for a single resource. Key components of the Cross Border Regional ATFM/CDM CONOPS include:

- Regional acceptance of the MID Regional ATFM CONOPS
    - Stakeholders agree to the adoption of the MID Regional ATFM CONOPS irrespective of the CONOPS adopted in their area of jurisdiction.
    - States commit to planning commitments for ATFM/CDM implementation.
    - All stakeholders commit to time lines set for MID Cross-Border Regional ATFM implementation.
    - Agreement to a common set of procedures for departure, destination and en-route ANSPs, Airport Operators, and Aircraft Operators. Continued education of all stakeholders of the benefits, both qualitative and quantitative, of ATFM/CDM implementation. Participating ANSPs to initiate the effort to build their individual capabilities and practice ATFM in accordance to ICAO guidance to provide ATFM service

- Cross Border Regional ATFM CONOPS
  - ANSP has an independent ATFM System.
  - An ANSP implements ATFM even though surrounding states have not done so.
  - ANSP independently manages demand/capacity of its own resources.
  - To achieve at least 70% flight participation, regional, international, and possibly airborne flights are required to be included in ATFM Measures.
  - Agreements with ANSPs having flights departing from their airspace to ANSPs with Cross Border Regional ATFM ConOps operating to respect CTOTs and Controlled Times Over (CTOs) as issued.
  - Implementation of this concept does not require a “Node” (as described in Cross- Border Multi-Nodal Regional ATFM/CDM).
  - Agreement to a common set of procedures for departure, destination, and en-route ANSPs, Airport Operators, and Aircraft Operators.
  - Participating ANSPs to initiate the effort to build their individual capabilities and practice ATFM in accordance to ICAO guidance to provide ATFM service.
  - Participating stakeholders connected via Internet interfaces.
  - Continued education of all stakeholders of the benefits both qualitative and quantitative of ATFM/CDM implementation.
- Specify Capacity and Predict Demand
  - Demand Prediction – Flight progress is via manual input or automated data feed (e.g., FDP or AFTN).
  - Capacity Management – Inputs from FMP and FOC are via ATFM web-based interface.
- Evaluate Alternatives, Initiate/Modify ATFM Measures
  - Aircraft Operators manage the ATFM Measures delay assigned to flights.
  - Aircraft Operators perform CDM with Airport Operators for ground/surface delay intent.

4.12 In addition to including airborne and international flights into ATFM measures, the Regional concept has a future enhancement which envisages Aircraft Operators may specify their assigned program delay to various stages of the flights; Gate, Surface (between gate and departure), or en-route. This ability for Aircraft Operators to specify their delay intent gives additional operational flexibility to achieve the same result.

Cross-Border Multi-Nodal Regional ATFM/CDM

4.13 A State/ANSP implements and operates an ATFM system based on the application of remote CTOT delivery impacting multiple FIRs/ sectors of airspace or airports coordinated via one single node within the country (Figure 2).

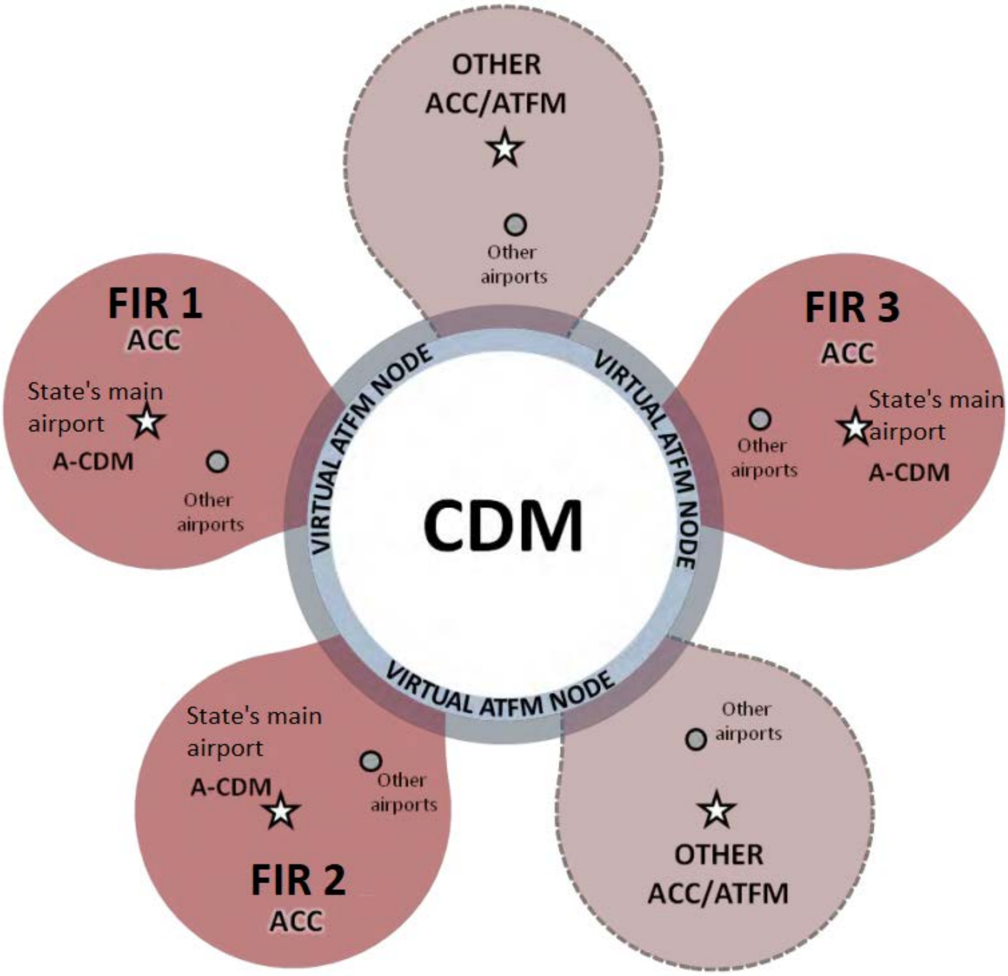


Figure 2: A Distributed Multi-Nodal ATFM Network

4.14 In this concept, each ANSP operates an independent, virtual ATFM/CDM node (they are responsible for ATFM/CDM within their area of responsibility) supported by an interconnected information-sharing framework. The flows of air traffic will then be effectively managed based on a common set of agreed principles among the participating ANSPs and airports. A node comprising of the ANSP and associated airports will be able to manage the demand and capacity through adjustments in aircraft Calculated Landing Times (CLDTs) which will in turn generate CTOTs for particular aircraft at the departure airport.

4.15 An ANSP performs demand and capacity balancing within their own area of authority and where ATFM measures require participation of regional and international flights, the flows will be managed by the agreed coordination procedures.

Key components of the Cross-Border Multi-Nodal Regional ATFM/CDM concept

4.16 Key components of the cross-border ATFM/CDM concept, to be considered in conjunction with the Regional ATFM CONOPS (Part II) and Regional ATFM Framework (Part I), are:

- Multi-Nodal Stakeholders interconnected via virtual communication framework

  Note: The group was established in the ICAO MID Secure Portal and Group name was renamed to be OPSDataEX for that purpose.

  - Each ANSP has an independent ATFM System.
  - Each ANSP independently manages demand/capacity of its own Airport(s).
  - Common agreement to share essential data for ATFM by all Multi-Nodal stakeholders.
  - Stakeholders/ANSPs communicate via existing Internet/Telecommunications networks as well as *OPSDataEX* group which was established in the ICAO MID Secure Portal.
  - Harmonized and integrated data exchange between all stakeholders in the Multi-nodal network.

- Specify Capacity and Predict Demand

  - Demand Prediction – Flight progress is via manual input or automated data feed (e.g., FDP or AFTN).
  - Capacity Management – Inputs from FMP and FOC are via ATFM web-based interface.

- Evaluate Alternatives, Initiate/Modify ATFM Measures

  - Aircraft Operators manage the ATFM Measures delay assigned to flights.
  - Aircraft Operators perform CDM with Airport Operators for ground/surface delay intent.
  - Slot assignments can be viewed via software web interface and notifications.

<u>Regulatory Aspects for ATFM/CDM Implementation</u>

4.17 The support of the regulatory authority is critical for successful ATFM implementation. The regulator must be involved in ATFM planning an implementation at the very earliest opportunity. All ICAO and ANSP/Regulator requirements will need to be complied with prior to ATFM/CDM implementation. In addition, adherence to the Regional ATFM Framework ensuring a "seamless" ATFM/CDM process between FIRs in the region.

4.18 It will be a requirement to perform a safety assessment prior to implementation of ATFM/CDM as per ICAO Document Annex 11 (Section 2.7).

<u>Publication of information</u>

4.19 ANSPs will be required to comply with normal Aeronautical Information Publication (AIP) processes to ensure the implementation of ATFM/CDM is communicated with the aviation community.

4.20 Experience shows that early and on-going communication in the form of written, workshop and training in addition to the required formal AIS process is a very important factor in gaining “buy-in”, acceptance and support from the operational stakeholder community.

4.21 It is also recommended that all stakeholders publish in-house education material and formal procedures for ATFM/CDM processes.

5- Implementation Risks and Mitigation

General risks and mitigation of Cross-Border ATFM/CDM implementation

5.1 Tables 2 - 14 summarises the general risks and mitigation for Cross-Border ATFM/CDM implementation.

Definition:	State/ANSP does not abide by regional ATFM procedures.
Result	Aircraft departing from within the airspace of non-participating ANS
Mitigation	Education on benefits of participation for region
Probability/Impact	Medium

Table 1: Risk 1 – Non-participation by ANSP in Regional ATFM ConOps

Definition:	Airline does not abide by Regional ATFM procedures
Result	Aircraft are non-compliant.
Mitigation	Urge participation by direct contact with concerned non- compliant airline
Probability/Impact	Medium

Table 2: Risk 2 – Non-participation by Airline in Regional ATFM ConOps

Definition:	Airport Authority does not accept ATFM concept and does not allow airlines to absorb delay at gate and on the ground either at the gate or between pushback and departure.
Result	Aircraft unable to absorb delay on the ground and becoming non-complaint.
Mitigation	Education and convincing airport authorities of network benefits for ATFM implementation.
Probability/Impact	Medium

Table 3: Risk 3 – Non-participation by Airport Operator

Definition:	Cross-Border Multi-Nodal Regional ATFM/CDM is not implemented.
Result	Safety impact of congested airspace leading to ATC/Pilot overload, inefficiencies, excessive fuel burn and carbon dioxide (CO2) emissions.
Mitigation	Popularize ATFM/CDM via all available means and to all possible stakeholders explaining benefits is very significant.
Probability/Impact	High

Table 4: Risk 4 – Non-action with respect to Cross-Border Regional ATFM

Definition:	Awareness and hence commitment of one or more stakeholders is lacking during project planning or actual implementation.
Result	Delayed or inefficient implementation
Mitigation	Comprehensive promoting and communication needed, early and continued benefits demonstrated at the airport to raise awareness.
Probability/Impact	Low

Table 5: Risk 5 – ATFM/CDM awareness not sufficient amongst stakeholders

Definition:	Not adhering to functional requirements when defining system and implementation.

Result	Implementation can be put in jeopardy, implementation may become fragmented.
Mitigation	Basic and agreed principles and Regional ATFM procedures to be followed. The Regional ATFM Framework must be respected and maintained but can be enhanced in line with implementation maturity.
Probability/Impact	Medium

Table 6: Risk 6 – Implementation not consistent with Cross-Border Regional ATFM principles or Regional ATFM procedures

Definition:	Stakeholders have different or even conflicting priorities and/or interests.
Result	Difficult to convince all stakeholders to participate
Mitigation	Basic and agreed principles and Regional ATFM procedures to be followed. The Regional ATFM Framework document must be respected and maintained but can be enhanced in line with implementation maturity.
Probability/Impact	Medium

Table 7: Risk 7 – Conflicting interests of stakeholders

Definition:	Stakeholders reluctant to release data.
Result	Project can be put in jeopardy, implementation may become fragmented or non–consistent.
Mitigation	Better Education and communication. Demonstrate security features.
Probability/Impact	High

Table 8: Risk 8 – Requirement for non-disclosure

Definition:	Unforeseen withdrawal due to political, budget restrictions, changes of priority, etc.
Result	Non-compliant operations.
Mitigation	Relying on airline participation to meet compliance standards.
Probability/Impact	Medium

Table 9 Risk 9 – One or more stakeholders/States withdraw from Cross-Border ATFM/CDM

Definition:	Project may be seen of less importance/priority and reduce availability of staff, finance and resources.
Result	Slow or non-implementation.
Mitigation	Education and convincing management of benefits of ATFM/CDM implementation.
Probability/Impact	Medium

Table 10: Risk 10 – Insufficient cooperation/support from Airport/Airline/ANSP management

Definition:	Poor data quality or insufficient acquisition.
Result	Unreliable project results, poor costs/benefit ratio.
Mitigation	Education and communication, standard acronyms and definitions to be used, standard ICDs to be used.
Probability/Impact	Medium

Table 11: Risk 11 – Data acquisition not satisfactory

Definition:	Following initial drive to consider implementation ATFM/CDM and project preparation, one or more major stakeholders decide to not participate.
Result	Project will stall, or implementation will have reduced effectiveness.
Mitigation	Continued collaboration and communication on benefits of regional implementation to be undertaken.
Probability/Impact	Medium

Table 12: Risk 12 – No go decision

Definition:	Diverse systems communicate poorly or not at all.
Result	Difficulty for uses to access CTOT, CTO and CLDT information on various ATFM systems. Loss of confidence, benefits reduced.
Mitigation	Use standard ICD.
Probability/Impact	Medium

Table 13: Risk 13 – Insufficient system integration

6- Post-Implementation Activities

ATFM/CDM becomes a daily operation

6.1 ATFM/CDM, whether Domestic or Cross-Border, will become a daily operation undertaken by all the stakeholders. Successful implementation will have shown the aviation community that for the entire supply chain to succeed, all will need to participate in the CDM process. Continued momentum and active engagement will need to be maintained.

Continued education of all stakeholders

6.2 As there might be no or partial participation by some stakeholders, continued education and benefit-proving must take place to continually increase participation by stakeholders.

Preparing for new functions

6.3 For Cross-Border programs there will be varying levels of participation of ANSPs. Therefore, there is a need for ANSPs to regularly review and apply the ATFM/CDM implementation criteria to assess if their operational and ATFM requirements have changed.

7- Timeline

7.1 The ICAO MID Air Navigation Strategy (MID Doc 002) provides a blueprint for coordinated Regional development, including capability improvements described in the ICAO Doc 9750 (Global Air Navigation Plan (GANP) - Sixth Edition) regarding ICAO Aviation System Block Upgrades (ASBU) roadmap. Air Traffic Flow Management (ATFM) taking a network view, is a key module in ASBU Blocks zero, one, two and three. B0/1-NOPS element – Initial integration of collaborative airspace management with air traffic flow management - has been identified by MIDANPIRG/18 as one of thirty-five priorities for the MID Region.

Phase IA – expected implementation duration: 1 Year;

- Enact regulations for the implementation of ATFM.
- Conduct bi-annual strategic airport and airspace capacity and demand analysis.
- Prepare for capacity demand balancing based on demand analysis.
- Develop and distribute an ATFM Daily Plan (ADP).

Phase IB – expected implementation duration 1 Year;

- Analyze operational flight plan (FPL) and ATS message distribution systems.
- Requirements for FPL to be submitted 3 hours prior to Estimated Off Block Time.
- Integrate ATFM, AMAN/DMAN, and A-CDM systems through common fixes, terminology, and communication protocols.
- Implement strategic airport slot allocation if necessary.
- Pre-tactical modelling of expected airport and airspace configuration and capacity demand balancing.
- Implementation, revision, or cancellation of GDPs for inbound traffic, or minutes-in-trail (MINIT) or miles-in-trail (MIT) where CTOT may not be applied.
- Post-Operational analysis to provide feedback for procedures and processes.

Phase II – expected implementation duration: 1 year.

- Distributed Multi-Nodal ATFM information distribution capability utilizing Flight Information Exchange Model (FIXM) version 3.0 (or later) should be implemented.
- Full interoperability of Cross-Border ATFM, A-CDM, AMAN, DMAN, ATM automation, and Airspace User systems should be implemented, utilizing FIXM 3.0 (or later), to provide seamless gate-to-gate collaborative ATFM operations.
- Implementation of pre-tactical and tactical capacity, and demand monitoring and analysis
- Pre-tactical GDP using CTOT for capacity demand balancing measures.
- Tactical ATFM measures including MIT, MINIT, and where necessary, CTO at the arrival fix (AFIX) or en-route Fix (RFIX), should be applied to flights throughout constrained airspace when a GDP is not implemented.

7.2 Refer to the Regional ATFM Framework document for further information on the ATFM Capability Phases and performance objectives.

ATTACHMENT A - ATFM Implementation Guidance - Assessment of Benefits

An interoperable network approach for the region will result in system-wide Demand Capacity Balancing. This approach enhances the safety and optimizes the efficiency of airports and available airspace. As the MID region, it becomes essential to optimize the use of available capacity through ATFM.

Throughout the MID region, individual States' ATM and ATFM equipment, services, procedures, airspace design, communications, and resources have a wide disparity in capabilities. These limitations often result in a less efficient operational environment. Prevalent throughout the study region are excessive MIT restrictions, fuel burn, CO2 emissions, aircraft departure holding on the ground, airborne holding, and delays.

Weather and other system constraints increase schedule buffer, delayed flights, cancellations, and missed connections. Flight delays add costs to airlines, passengers, Airport Operators, and States. Aviation inefficiencies have trickle-down impacts on other sectors due to lost time and productivity. As traffic demand increases, delays will also increase if resource capacity is not increased.

The expectant results of an interoperable ATFM network of States will have potential benefits to airlines, passengers, Airport Operators, and States. Although we do not have any general figures for the region, our analysis identifies generic qualitative and quantitative benefits.

<u>Qualitative Benefits</u>

Regional Wide Benefits

Implementation of Regional ATFM will derive the following benefits:

- More timely and informed collaborative decision making, which takes the entire region's requirements into consideration.
- A coordinated networked ATFM approach to all air traffic flying in the region would result in a seamless optimized expeditious flow of traffic throughout the region.
- Presently there is little communication between the ANSPs relating to ATFM. With the implementation of ATFM, automated and procedural communication will be improved, enhancing not only ATFM communication, but also ATC communications.
- As ATFM develops in the region, States will be incentivized to collaborate on airspace design so as to accommodate better flows of traffic to accommodate ATM and ATFM procedures.
- Enhanced situational awareness for the region through shared information.
- As Regional ATFM matures, better planning and CDM in all phases of ATFM, including post-event analysis, will occur.
- The traditional model of ATFM implementation requires only domestic traffic to adhere to the controlled times issued. The Regional ATFM Concept of Operations requires all aircraft to adhere to controlled times. Therefore, States with no domestic flights, can perform demand and capacity balancing.
- In the traditional model of ATFM implementation, only domestic traffic is subject to ATFM measures, therefore domestic traffic can be unfairly delayed while

nonparticipating aircraft (international flights) are not. With the Regional ATFM Concept, all traffic is expected to be subject to ATFM measures, and the delay is distributed fairly and equitably amongst all traffic.

- Establishment of Regional ATFM will lead to enhanced information-sharing and CDM practices during extraordinary/contingency events such as volcanic eruptions, disease, political unrest, and war.

ANSPs

- Smoother transition of DCB from strategic to pre-tactical and tactical phases of ATFM.

- Network-managed DCB brings about overall optimization of airspace.

- Better planning due to accurate and common view of demand and capacity predictions.

- More timely and informed decision-making, taking the entire region's requirements into consideration

- Improved modelling and evaluation of proposed ATFM Measures in collaboration with stakeholders prior to implementation.

- Availability of a data platform that integrates various flight data sources and provides common situational awareness to the stakeholders.

- An environment in which ATFM Measures and other operational procedures can be improved through post-operational analysis.

- Improved special event and flexible usage of airspace planning.

- More efficient DCB at airports and in airspace.

- Optimization and reduction of staffing. During peaks of un-metered traffic, ANSPs are often required to roster extra staff to cope with increased workloads. With metered flows of traffic, workload is reduced, therefore reducing staffing levels.

- Optimization and allocation of resources (maintenance of equipment, Navigation Aid [NavAid] calibrations).

- Implementation of Performance-Based Navigation (PBN) procedures brings about many benefits to Airline Operators and ANSPs; however, if there is an un-metered flow of arrival or departure traffic, the effectiveness of PBN procedures could be negated. During times of high demand, ATC is required to vector aircraft off the PBN route in order to satisfy separation rules. Implementation of ATFM will ensure a steady stream of de-conflicted air traffic before entering the arrival phase, which will allow more aircraft to complete the full PBN approach and receive the maximum benefits. This results in reduced workload for the ATCOs and pilots.

- Improved safety.

Airline Operators

- Improved flexibility for Airline Operators to optimize their schedules through CDM.
- Improved flexibility for flights to absorb inevitable delay on the ground or efficiently through the en-route portion of the flight rather than by airborne holding in the terminal area.
- More reliable and timely access to information indicating stakeholder intent—this applies to Airline Operators sharing how they intend to operate the flights as well as to States and airports sharing any resource constraints.
- Reduced sector times resulting in reduction in schedule buffer times.
- Maximized benefits for aircraft with advanced avionics (PBN routings).
- Significant fuel savings.
- Significant reduction in CO_2 emissions.
- Better aircraft utilization.
- Better passenger experience.
- Optimization of staffing and allocation of resources.
- Improved safety.

Airport Operators

- With enhanced situational awareness of arrival and departure times, apron planners will be able to improve gate allocation, especially during constrained periods. This leads to better utilization of ground resources (ground handling, catering, refueling, etc.).
- Enhanced situational awareness assists the entire community in the airport precinct (passengers, immigration, customs, security, baggage handling, etc.).
- Optimization of staffing.
- ATFM integrated with A-CDM will result in better turnaround times and on-time performance of Airline Operators.

Safety

- Standard ATM practices of separating and sequencing traffic by vectors, speed control, and airborne holding are carried out during un-metered peaks of traffic. These practices are proven safe and effective. However, during these peak periods, the workload on ATC and pilots can increase significantly, thereby reducing the margin for error. Through ATFM, a constant manageable flow of traffic is achieved, resulting in a more manageable workload and hence, a safer operation. A network approach to ATFM reduces sector/system saturation, increases efficiency, and enhances safety.
- Unstable approaches have been recognized as a causal factor in aircraft incidents. A possible cause of unstable approaches is excessive and unreasonable speed control and vectoring (late or greater than 30 degree Instrument Landing System [ILS] intercepts). With a metered flow of traffic, the requirement of ATCs to undertake excessive tactical

sequencing management (vectors and speed control) is reduced with the possible result in reduced unstable approaches events.

– As ATFM develops in the region, States will be forced to collaborate on airspace design so as to accommodate better flows of traffic to accommodate ATFM procedures.

– Often with the implementation of ATFM, States enhance their ability for severe weather detection. This earlier detection of weather is shared with Airline Operators and ANSPs, increasing situational awareness. In addition, this is taken into account when determining the capacity of resources, resulting in the correct ATFM measure being implemented, which can have a direct impact on safety.

– Communication networks will improve between States with ATFM implementation so as to accommodate CDM. A resultant benefit will be reduced coordination errors, which leads to enhanced safety.

MID RVSM SMR 2021

MID RVSM SAFETY MONITORING REPORT 2021 (SMR 2021)

Prepared by the Middle East Regional Monitoring Agency (MIDRMA)

SUMMARY

The aim of the MID RVSM Safety Monitoring Report 2021 is to provide airspace safety review of the MID RVSM airspace and to highlight by means of arguments and supporting evidence that the implementation of RVSM in the ICAO Middle East Region is acceptably safe.

1. INTRODUCTION:

1.1 Executive Summary

The MID RVSM Safety Monitoring Report is issued by the Middle East Regional Monitoring Agency (MIDRMA) for endorsement by the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG).

The report presents evidence that according to the data and methods used, all safety objectives set out in the MID RVSM Safety Policy in accordance with ICAO Doc 9574 (2nd Edition) continue to be met in operational services within the Middle East RVSM airspace with some reservation for Safety Objective 3 which is under continuous monitoring by MIDRMA.

To conclude on the current safety of RVSM operations, the three key safety objectives endorsed by MIDANPIRG have to be met:

Objective 1 The risk of collision in MID RVSM airspace due solely to technical height-keeping performance meets the ICAO target level of safety (TLS) of 2.5×10^{-9} fatal accidents per flight hour.

The value computed for technical height risk is estimated **3.509×10^{-12}** this meets RVSM Safety Objective 1.

Objective 2 The overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace meets the ICAO overall TLS of **5×10^{-9}** fatal accidents per flight hour.

The value computed for the overall risk is estimated **4.073×10^{-10}** this meets RVSM Safety Objective 2.

Objective 3 Address any safety-related issues raised in the SMR by recommending improved procedures and practices; and propose safety level improvements to ensure that any identified serious or risk-bearing situations do not increase and, where possible, that they decrease. This should set the basis for a continuous assurance that the operation of RVSM will not adversely affect the risk of en-route mid-air collision over the years.

Middle East RVSM Airspace Estimated Annual Flying Hours = (**1,421,352**) Average Aircraft Speed = **444.35 kts**			
Risk Type	**Risk Estimation**	**ICAO TLS**	**Remarks**
Technical Risk	**3.509×10^{-12}**	**2.5×10^{-9}**	**Below ICAO TLS**
Overall Risk	**4.073×10^{-10}**	**5×10^{-9}**	**Below ICAO TLS**

Conclusions:

(i) The estimated risk of collision associated with aircraft height- keeping performance is **3.509×10^{-12}** and meets the ICAO TLS of **2.5×10^{-9}** fatal accidents per flight hour (RVSM Safety Objective1).

(ii) The estimated overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies is **4.073×10^{-10}** meets the ICAO overall TLS of **5×10^{-9}** fatal accidents per flight hour (RVSM Safety Objective 2)

(iii) Based on currently-available information (Except for Tripoli FIR), there is no evidence available to MIDRMA that the continued operations of RVSM adversely affects the overall vertical risk of collision other than the violation of Non-RVSM approved aircraft to the MID RVSM airspace which is under continuous monitoring and review by MIDRMA. (More details in 2.5)

1.2 **Considerations on the Safety Objectives for MID RVSM SMRs**

When considering the three safety objectives for RVSM, the following considerations should be borne in mind:

1. The assessment of risk against the TLS, both for technical and overall risk estimates, relies on height keeping performance data to assess the risk in the vertical plane and studies of traffic density to calculate the risk in the horizontal plane. There are numbers of assumptions that must be verified to satisfy the reliability of the risk assessment, the verification of these assumptions deals primarily with monitoring of aircraft performance issues.
2. The Aircraft performance is assessed by individual airframe and by monitoring group. A monitoring group consists of aircraft that are nominally of the same type with identical performance characteristics that are made technically RVSM compliant using a common compliance method. Monitoring group analysis is necessary to verify that the Minimum Aviation System Performance Standards (MASPS) for that group is valid. Aircraft that are made RVSM compliant on an individual basis are termed non-group.
3. RVSM Safety Objective 2, dealing with overall risk, takes into account the technical risk together with the risk from all other causes. In practice, this relates to the human influence and assessment of this parameter relies on adequate reporting of Large Height Deviation (LHD) Reports, and the correct interpretation of events for input to the CRM.
4. RVSM Safety Objective 3 requires the RMA to monitor long-term trends and to identify potential future safety issues, this compare the level of risk bearing incidents for the current reporting period. It also highlights if there are issues that should be carried forward as recommendations to be adopted for future reports.

2.0 Discussion

Scope:

The geographic scope of the MID RVSM Safety Monitoring Report covers the MID RVSM airspace, which comprises the following FIRs/UIRs:

Amman	Bahrain	Beirut	Baghdad	Cairo	Damascus	Emirates
Jeddah	Kuwait	Khartoum	Muscat	Sana'a	Tehran	Tripoli*

T-1: FIRs/UIRs of the Middle East RVSM Airspace

***Note: Tripoli FIR excluded from the RVSM safety analysis due to lack of data.**

The Data Sampling periods covered by SMR 2020 are as displayed in the below table

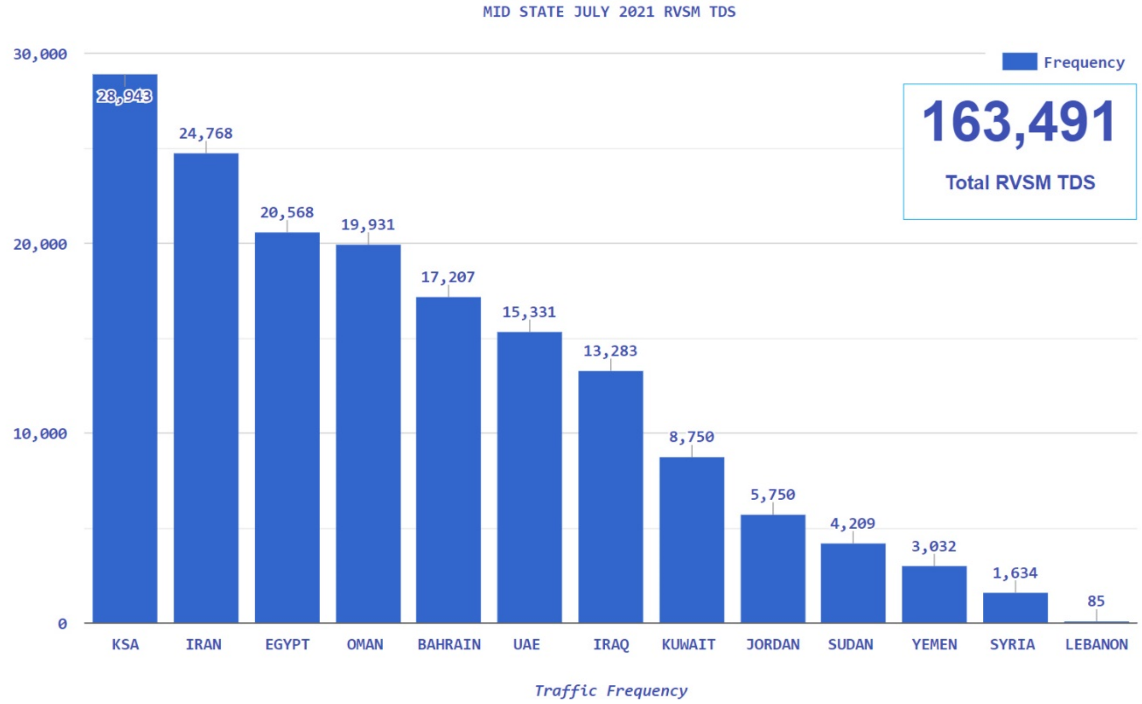
Report Elements	Time Period
Traffic Data Sample	01/07/2021 - 31/07/2021
Operational & Technical Errors	01/01/2021 - 31/12/2021

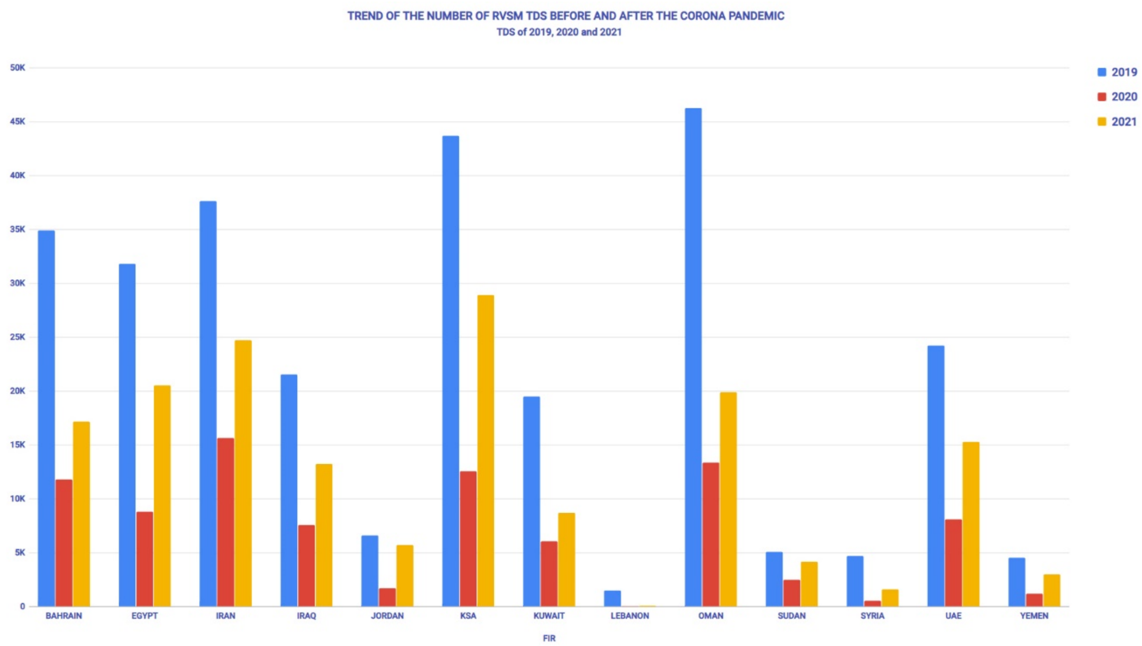
2.1 The descriptions of the traffic data collected from each MIDRMA Member State are depicted in table below:

MID States	**No. of Flights**	**Received Dates**	**Status**
Bahrain FIR	17207	12/08/2021	Accepted
Cairo FIR	20568	26/08/2021	Accepted
Amman FIR	5750	28/08/2021	Accepted
Muscat FIR	19931	17/08/2021	Accepted
Tehran FIR	24768	12/09/2021	Accepted
Khartoum FIR	4209	30/08/2021	Accepted
Emirates FIR	15331	22/08/2021	Accepted
Damascus FIR	1634	12/09/2021	Accepted
Sana'a FIR	3032	23/08/2021	Accepted
Baghdad FIR	13283	25/08/2021	Accepted
Kuwait FIR	8750	01/08/2021	Accepted
Jeddah FIR	28943	19/08/2021	Accepted
Beirut FIR	85	04/09/2021	Accepted
Tripoli FIR	-	-	No Data Submitted
Total	**163491**		

Table 1: Details of the MID States RVSM Traffic Data Sample (TDS) for July 2021.
Note: MIDRMA still faces number of errors/mistakes in the delivered TDS data from many States.

2.2 The description of the traffic data processed for each MIDRMA member state by the MID Risk Analysis Software (MIDRAS) is depicted in the graph below, a total of **163,491** flights were processed for the 13 FIRs, these flights were evaluated and processed very carefully to ensure accurate results according to the data submitted.

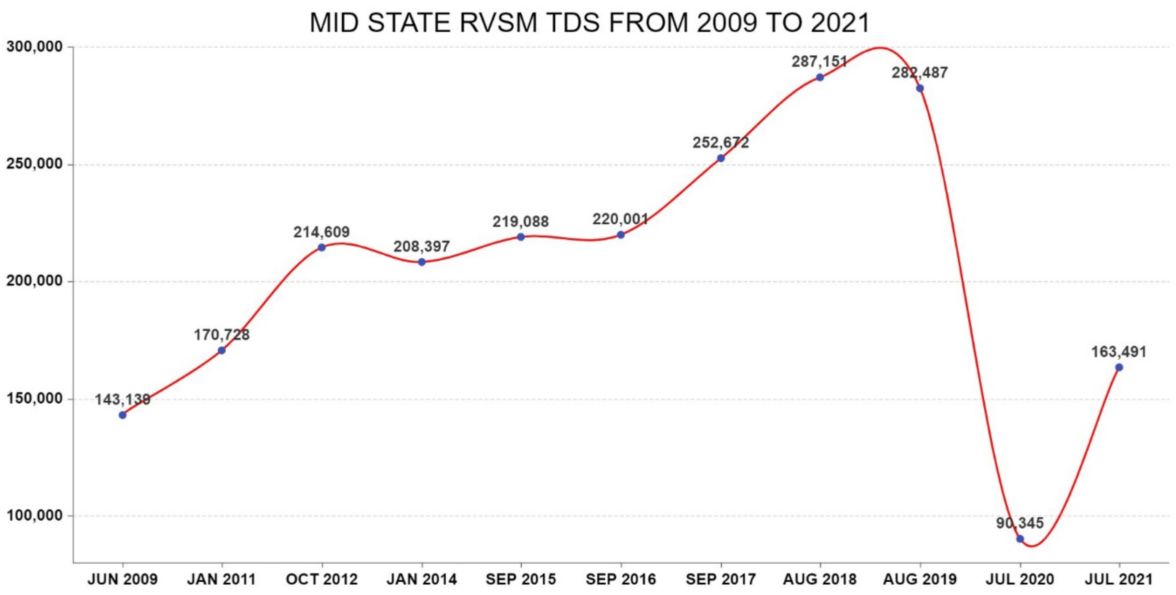




2.3 The COVID-19 pandemic has had a major impact on the airline industry across the world due to travel restrictions and reduced demand among travelers. The significant decrease in passenger demand is starting to improve compared to 2020 while this SMR TDS has reached 58% of what was recorded for TDS 2019 (before the pandemic).

#	MID FIRs	No of TDS July 2020	No of TDS July 2021	TDS Difference 2020 vs 2021	% of TDS Difference 2020 vs 2021
1	**Bahrain FIR**	11844	17207	5363	**↑ 45.28 %**
2	**Cairo FIR**	8838	20568	11730	**↑ 132.72 %**
3	**Amman FIR**	1752	5750	3998	**↑ 228.2 %**
4	**Muscat FIR**	13404	19931	6527	**↑ 48.69 %**
5	**Tehran FIR**	15689	24768	9079	**↑ 57.87 %**
6	**Khartoum FIR**	2526	4209	1683	**↑ 66.63 %**
7	**Emirates FIR**	8137	15331	7194	**↑ 88.41 %**
8	**Damascus FIR**	582	1634	1052	**↑ 180.76 %**
9	**Sana'a FIR**	1233	3032	1799	**↑ 145.9 %**
10	**Jeddah FIR**	12605	28943	16338	**↑ 129.62 %**
11	**Beirut FIR**	28	85	57	**↑ 203.57 %**
12	**Baghdad FIR**	7602	13283	5681	**↑ 74.73 %**
13	**Kuwait FIR**	6105	8750	2645	**↑ 43.33 %**
14	**Tripoli FIR**	NO TDS	NO TDS	-	-
	Total	**90,345**	**163,491**	**73,146**	**↑ 80.96%**

Comparison Table of MIDRMA Member States TDS for Years 2020 and 2021



2.4 Compiling and correcting the traffic data and then analysing it require a lot of efforts and follow up with the focal points to ensure the highest quality results obtained are reliable to study the impact of RVSM implementation within the ICAO Middle East Region, the MIDRMA decided to arrange for an upgrade to the MIDRAS to overcome problems with the errors in the received TDS from some member states, the upgrade will include other necessary features which will facilitate calculating all RVSM risk parameters and shall save a lot of time to avoid rejecting the TDS due to a lot of errors which usually delay the production of the SMR.

#	Reporting Points	FIRs	Frequency
1	**TASMI**	BAGHDAD / KUWAIT	4951
2	**RATVO**	BAGHDAD / ANKARA	4857
3	**SIDAD**	BAGHDAD / KUWAIT	4823
4	**DAVUS**	BAHRAIN / KUWAIT	4500
5	**NINVA**	BAGHDAD / ANKARA	4133
6	**ULINA**	CAIRO / AMMAN	4041
7	**KITOT**	CAIRO / JEDDAH	3634
8	**ULADA**	BAHRAIN / JEDDAH	3541
9	**LONOS**	BAHRAIN / KUWAIT	3156
10	**DEESA**	AMMAN / JEDDAH	3004
11	**RASKI**	MUSCAT / MUMBAI	2848
12	**GABKO**	TEHRAN / EMIRATES	2661
13	**ALPOB**	BAHRAIN / EMIRATES	2542
14	**RASDA**	CAIRO / NICOSIA	2477
15	**NUBAR**	CAIRO / KHARTOUM	2363
16	**TUMAK**	BAHRAIN / EMIRATES	2339
17	**DAROR**	BAHRAIN / JEDDAH	2305
18	**NARMI**	BAHRAIN / JEDDAH	2290
19	**PASAM**	CAIRO / JEDDAH	2249
20	**BONAM**	TEHRAN / ANAKRA	2221

TDS 2021 Top 20 Busiest FIR Entry / Exit Points in the ICAO MID RVSM Airspace

2.5 For the Seventh consecutive Safety Monitoring Reports, Tripoli FIR excluded temporary from the RVSM safety analysis due to lack of TDS and LHD reports, taking into consideration the MIDRMA never done any risk analysis for Tripoli FIR RVSM airspace since Libya joint the MIDRMA, this issue require the MIDRMA board and MIDANPIRG to decide what action should be taken if RVSM operations resume within the Tripoli FIR in the future

2.6 **The Collision Risk Model (CRM)**

2.6.4 The risk of collision to be modelled is that due to the loss of vertical separation between aircraft flying between FL290 and FL410 in a given portion of an airspace. One collision between two aircraft is counted as the occurrence of two accidents. The risk of collision depends both on the total number and types of aircraft flying in the system and the system characteristics.

2.6.2 The CRM provides an estimate of the number of accidents within an airspace system that might occur per aircraft flight hour due to aircraft collisions resulting from the loss of vertical separation in an RVSM environment analysis, is expressed in terms of quantifiable parameters. In the vertical dimension the CRM can be broken down in order to separately model a single route on which aircraft are flying in the same or opposite directions at adjacent flight levels, pairs of crossing routes and combinations of individual and intersecting routes, this model is applied equivalently to vertical, lateral and longitudinal separation.

2.6.3 Three parameters used within the CRM:

a. The Vertical Overlap Probability, denoted as Pz(1 000).

b. The Lateral Overlap Probability, denoted as Py(0).

c. The aircraft Passing Frequency are the most important quantities in determining the vertical collision risk. Of these, the vertical overlap probability is also an important parameter to calculate.

2.7 Technical Height Keeping Performance Risk Assessment

RVSM Safety Objective 1

The risk of collision in MID RVSM airspace due solely to technical height-keeping performance meets the ICAO target level of safety (TLS) of **2.5×10^{-9}** fatal accidents per flight hour.

Direct evidence of compliance with TLS for Technical Height-Keeping Error

The result shows the risk of collision due to technical height-keeping performance is estimated to be **3.509×10^{-12}** fatal accidents per flight hour, which is less than the ICAO TLS **2.5×10^{-9}**.

MID RVSM SMRs Technical Risk Values				
Year 2006	**Year 2008**	**Year 2010**	**Year 2011**	**Year 2012/13**
$2.17\text{x}10^{-14}$	**$1.93\text{x}10^{-13}$**	**$3.96\text{x}10^{-15}$**	**$5.08\text{x}10^{-14}$**	**$6.37\text{x}10^{-12}$**
Year 2014	**Year 2015**	**Year 2016**	**Year 2017**	**Year 2018**
$3.18\text{x}10^{-12}$	**3.056×10^{-10}**	**$6.347\text{x}10^{-11}$**	**$4.966\text{x}10^{-11}$**	**$1.562\text{x}10^{-11}$**
Year 2019	**Year 2020**	**Year 2021**		
$2.012\text{x}10^{-13}$	**$9.185\text{ x}10^{-13}$**	**3.509×10^{-12}**		

According to the technical risk values as shown in the above table the TLS values still, meet the ICAO TLS.

2.7.1 Supporting evidence of compliance with TLS for technical height-keeping performance

To demonstrate that the result is reliable, it is necessary to demonstrate that the following assumptions are true:

a. The estimated value of the frequency of horizontal overlap, used in the computations of vertical-collision risk, is valid;

b. Pz(1000) – the probability of vertical overlap due to technical height-keeping performance, between aircraft flying 1000 ft. separation in MID RVSM airspace is estimated **5.207×10^{-10}** valid and is less than the ICAO requirement of **1.7×10^{-8}**.

c. The monitoring target for the MID RVSM height-monitoring programme is an on-going process.

d. The input data used by the CRM is valid.

e. An adequate process is in place to investigate and correct problems in aircraft technical height-keeping performance.

2.7.2 Calculating the Probability of Lateral Overlap (P_y (0))

The probability of lateral overlap $P_y(0)$ is the probability of two aircraft being in lateral overlap which are nominally flying on (adjacent flight levels of) the same route. The calculation of the Py (0) for the SMR 2021 has the following to consider:

a. The MIDRMA continued to calculate the probability of lateral overlap $\boldsymbol{P_y(0)}$ for all the MID RVSM airspace as per the ICAO methodology developed for this purpose and derived by the MID Risk Analysis Software (MIDRAS).

b. The MIDRMA calculated the probability of lateral overlap $\boldsymbol{P_y(0)}$ for each MIDRMA Member State and found all the results are valid :

1- Bahrain FIR:
Passing Frequency (n_equiv): 6.43304E-003
Probability of Lateral Overlap (Py(0)): 0.16441.

2- Cairo FIR:
Passing Frequency (n_equiv): 2.38668E-001
Probability of Lateral Overlap (Py(0)): 0.15226.

3- Baghdad FIR
Passing Frequency (n_equiv): 2.95343E-002
Probability of Lateral Overlap (Py(0)): 0.1658.

4- Tehran FIR
Passing Frequency (n_equiv): 4.18680E-002
Probability of Lateral Overlap (Py(0)): 0.14065.

5- Amman FIR
Passing Frequency (n_equiv): 4.13924E-002
Probability of Lateral Overlap (Py(0)): 0.13698

6- Kuwait FIR
Passing Frequency (n_equiv): 3.87258E-003
Probability of Lateral Overlap (Py(0)): 0.1716

7- Beirut FIR
Passing Frequency (n_equiv): Not enough traffic to measure
Probability of Lateral Overlap (Py(0)): 0.097463

8- Muscat FIR
Passing Frequency (n_equiv): 1.93820E-001
Probability of Lateral Overlap (Py(0)): 0.16611

9- Jeddah FIR
Passing Frequency (n_equiv): 2.13603E-002
Probability of Lateral Overlap (Py(0)): 0.14626

10- Khartoum FIR
Passing Frequency (n_equiv): 5.63241E-002
Probability of Lateral Overlap (Py(0)): 0.17548

11- Damascus FIR
Passing Frequency (n_equiv): 2.82413E-001
Probability of Lateral Overlap (Py(0)): 0.12441

12- Emirates FIR
Passing Frequency (n_equiv): 3.61452E-003
Probability of Lateral Overlap (Py(0)): 0.16116

13- Sana'a FIR
Passing Frequency (n_equiv): 2.39246E-001
Probability of Lateral Overlap (Py(0)): 0.17121

c. Overall, the results are considered to be valid.

2.7.3 Pz(1000) Compliance

The Pz(1000) is the probability that two aircraft at adjacent RVSM flight levels will lose vertical separation due to technical height keeping errors. The value of the probability of vertical overlap Pz(1000), based on the actual observed ASE and typical AAD data is estimated to be of **5.207×10^{-10}**

This value meets the Global System Performance Specification that the probability that two aircraft will lose procedural vertical separation of 1000ft should be no greater than **1.7×10^{-8}**.

The MIDRMA continues to issue the minimum monitoring requirements (MMRs) through the automated MMR software which is programmed to address the MIDRMA member states with their updated requirements according to the latest RVSM approvals received, the MMR table valid for December 2021 is available in **Appendix B**.

Note: All member states are required to check and comply with their MMR through the MIDRMA website (www.midrma.com).

2.7.1 **Conclusions on Technical Vertical Collision Risk:**

a. The current computed vertical-collision risk due to technical height-keeping performance meets the ICAO TLS.

b. The probability of vertical-overlap estimate, Pz(1000), satisfies the global system performance specification.

c. Most monitoring groups are complying with ICAO TVE component requirements (also known as technical height-keeping group requirements).

2.7.2 **Recommendations for Safety Objective 1:**

a. The MIDRMA shall continue to review the content and structure of its aircraft monitoring groups (on going task).

b. The MIDRMA will continue to keep the methods of calculating the technical CRM parameters and the risk due to technical height keeping errors under review and explore more options to enhance the MID Risk Analysis Software (MIDRAS),

Note: new project has started to include more features in the MIDRAS (will be presented to the MIDRMA Board meeting for approval.

c. The MIDRMA shall carry out continuous height monitoring survey and investigation concerning aircraft flying within the MID RVSM airspace by collecting the TDS from member states offered to submit their RVSM TDS on a monthly basis.

d. More MIDRMA Member states other than Bahrain, Iraq and UAE are encouraged to send their monthly RVSM traffic data to explore more possible violations to the MID RVSM airspace.

2.8 Assessment of overall risk due to all causes against the TLS of 5 x 10^{-9} fatal accidents per flight hour

RVSM Safety Objective 2

The overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace meets the ICAO overall TLS of **5 x 10^{-9}** fatal accidents per flight hour.

The value computed for the overall risk is estimated **4.073 x 10^{-10}** this meets RVSM Safety Objective 2.

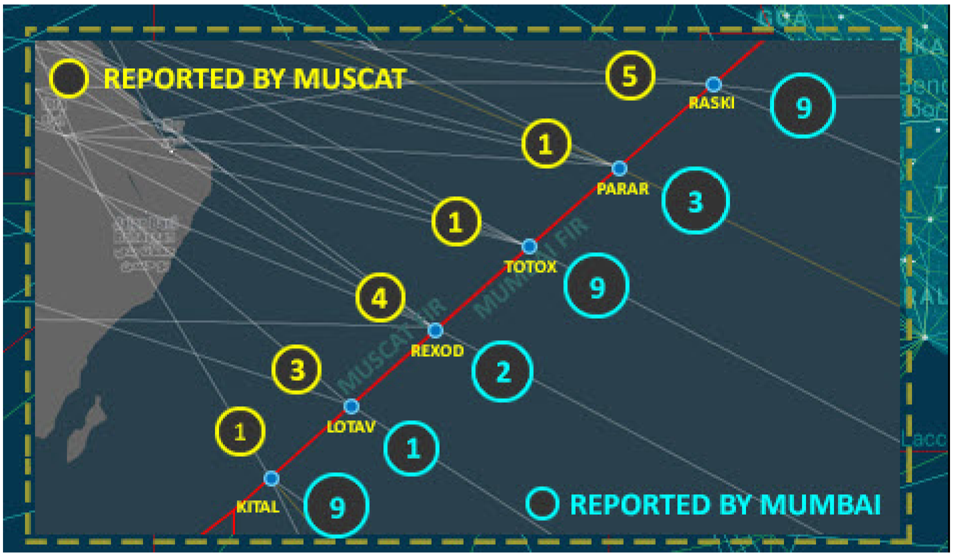
<table>
<tr><th colspan="5">Overall Risk Values</th></tr>
<tr><th>Year 2006</th><th>Year 2008</th><th>Year 2010</th><th>Year 2011</th><th>Year 2012/13</th></tr>
<tr><td>Not calculated</td><td>4.19x10^{-13}</td><td>6.92x10^{-12}</td><td>1.04x10^{-11}</td><td>3.63x10-11</td></tr>
<tr><th>Year 2014</th><th>Year 2015</th><th>Year 2016</th><th>Year 2017</th><th>Year 2018</th></tr>
<tr><td>4.91x10^{-11}</td><td>7.351x10^{-10}</td><td>5.691x10^{-10}</td><td>4.518 x10^{-11}</td><td>9.845 x10^{-11}</td></tr>
<tr><th>Year 2019</th><th>Year 2020</th><th colspan="3">Year 2021</th></tr>
<tr><td>8.345 x10^{-10}</td><td>5.206 x10^{-10}</td><td colspan="3">4.73 x 10^{-10}</td></tr>
</table>

2.8.1 The vertical risk estimation due to atypical errors has been demonstrated to be the major contributor in the overall vertical-risk estimation for the MID RVSM airspace, In the previous SMRs the processed data were severely influenced by either NIL reporting of Large Height Deviations (LHDs) and very few reports of categories A, B, C, D, J and K as without enough data (especially from FIRs with high volume of traffic) will not reflect confidence with the final results.

2.8.2 The MIDRMA continues to monitor the LHD reports at the eastern FIR boundary of Muscat FIR filed by Mumbai, the MIDRMA indicated in SMR 2017 the level of LHD reports filed by Muscat and Mumbai ATCUs related to each other at their transfer of control points reached to a dangerous level and started to effect the ICAO TLS of RVSM implementation in the MID and APAC regions, therefore the MIDRMA requested from MIDRMA Board/15 meeting (Muscat – Oman 29 – 31 January 2018) to open a Safety Protocol for the purpose of resolving this issue as soon as possible.

2.8.3 Although, the traffic level reduced at the common FIR boundary points for Muscat and Mumbai, the MIDRMA can't see much improvement for SMR 2021 as the safety concern still exist and more works required from both ATCUs to close this safety protocol such as the implementation of OLDI/AIDC which is still ambiguous at this stage and required follow up from MIDANPIRG.

Note: A Safety Protocol is a critical safety issue effecting the implementation of RVSM operations which require the concerned authority an immediate action to rectify/resolve the problem in a certain period of time under the supervision of MIDRMA and ICAO MID Office.

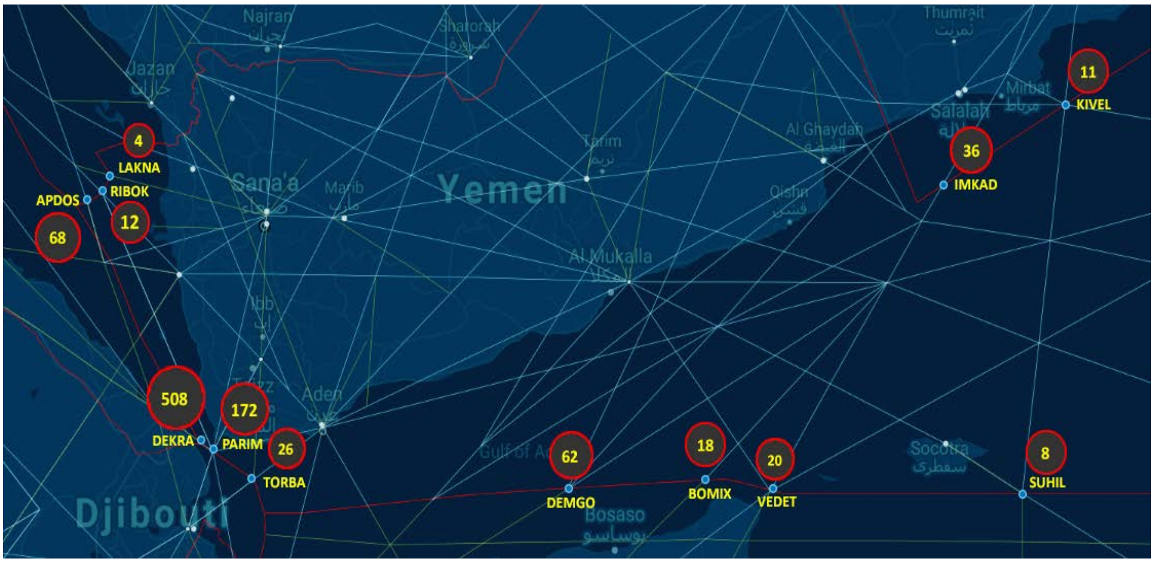


2.8.4 The Safety Protocol is under continuous review by MIDRMA and MAAR and the LHD reports filed by all concerned ATC Units are investigated and evaluated through the MIDRMA online LHD system and further update will be addressed to the next MIDRMA Board meeting.

2.8.5 The problem of the increased number of LHD reports submitted by Sana'a ACC related to some its neighboring ATCUs began to appear more than three years ago and did not improve even with the decrease in the number of air traffic in 2020 and 2021 due to the outbreak of the Corona pandemic, the MIDRMA is addressing this issue to the MIDRMA Board/17 to take all necessary measures to resolve this problem.

2.8.6 Through the evaluation review for the LHD reports valid for SMRs 2017, 2018, 2019 and 2020 the MIDRMA noticed very few Member States are investigating the reported LHDs related to their FIRs and reply with their outcomes/corrective actions. The meeting may wish to note that the Online LHD System has the feature to allow all Member States to forward their reports directly to the concerned focal points responsible to receive the LHD reports and allow them to reply with their outcomes in the same report which will be archived for future analysis.

2.8.7 The MIDRMA pointed out during the last Board meeting the issue of lack of response to the received LHD reports using the feature of direct response to the reporting unit to ensure that all responses are archived and referenced when needed. Unfortunately, the extreme majority of the Member States are not using this feature and don't bother to investigate and reply to the received LHD reports.



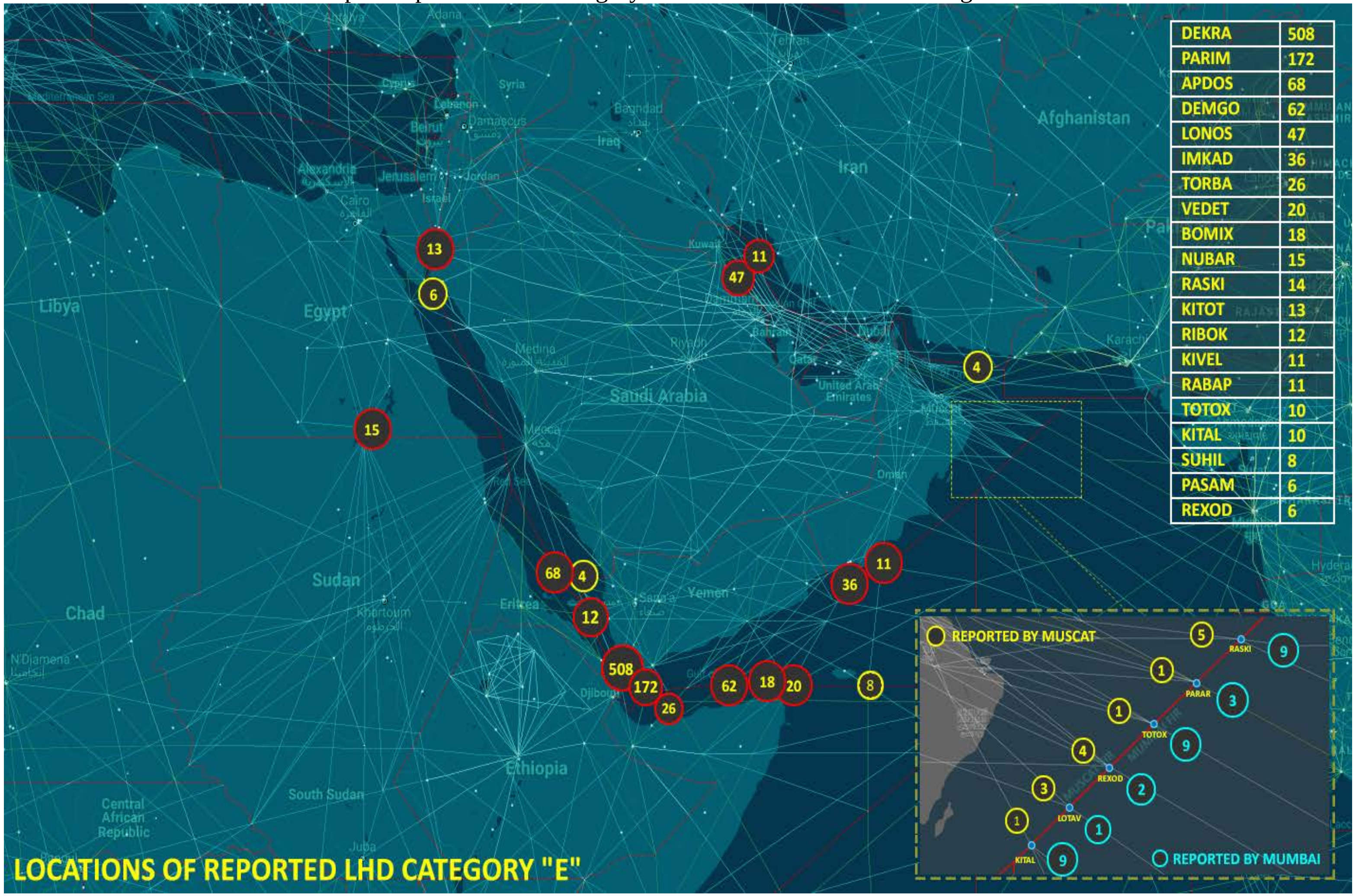
2.8.8 The Table below presents a summary of operational risk associated with Large Height Deviation (LHD) reports by LHD categories, these reports used to calculate the overall vertical collision risk for the MID RVSM airspace.

LHD Cat. Code	**Large Height Deviation (LHD) Category**	**No. of LHDs**	**LHD Duration (Sec.)**
A	Flight crew fails to climb or descend the aircraft as cleared	**6**	**95**
B	Flight crew climbing or descending without ATC clearance	**-**	**-**
C	Incorrect operation or interpretation of airborne equipment	**-**	**-**
D	ATC system loop error	**-**	**-**
E	ATC transfer of control coordination errors due to human factors	**42**	**990**
F	ATC transfer of control coordination errors due to technical issues	**1**	**15**
G	Aircraft contingency leading to sudden inability to maintain level	**-**	**-**
H	Airborne equip. failure and unintentional or undetected FL change	**2**	**25**
I	Turbulence or other weather related cause		
J	TCAS resolution advisory and flight crew correctly responds	**1**	**5**
K	TCAS resolution advisory and flight crew incorrectly responds	**-**	**-**
L	An aircraft being provided with RVSM separation is not RVSM approved	**1**	**20**
M	Other	**-**	**-**
	Total	**53**	**1150**

Summary of Operational Risk associated with Large Height Deviation Reports

MID RVSM SMR 2021

2.8.9 The picture below reflects the locations of the top 20 reported LHDs category E in the ICAO Middle East Region.



MID RVSM SMR 2021

2.8.10 Effects of Future Traffic Growth

For the second year, the Coronavirus outbreak and the relevant precautionary measures to limit its spreading are having clear impacts on human mobility at global scale. This provoked a reduction of domestic and international volumes of air passenger traffic worldwide, such effects are currently being observed in the Middle East region. This has clear implications for the aviation industry as well as indirect consequences to several sectors (e.g. tourism) and the economy at large as well as the society.

The MIDRMA continuously monitoring the traffic growth from the RVSM traffic data received on a monthly basis from Bahrain, Iraq and UAE and found the traffic growth compared with July 2020 has increased by 25% - 30% . These range from a quick and complete recovery to less optimistic scenarios of a slower or even incomplete recovery, and will depend on the duration and severity of the lockdown and the spread of this virus in the MIDRMA member states.

The effect of future traffic growth on the vertical collision risk can be evaluated on the assumption of a linear relationship between traffic growth and frequency of horizontal overlap, which will directly affect the two components of the risk: the risk due to technical height-keeping performance and due to atypical operational errors.

With the current uncertainty over traffic growth this issue will be revisited when the Middle East economic conditions return to more normal growth.

2.8.11 Conclusions on the overall vertical risk:

a. The overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace, estimated from the operational and technical vertical risks calculated with LHD reports from most of the member states, the computed result for this SMR is considered to be representative for the MID RVSM airspace.

b. The effect of future traffic growth on the vertical collision risk can be evaluated on the assumption of a linear relationship between traffic growth and frequency of horizontal overlap, which will directly affect the two components of the risk: the risk due to technical height-keeping performance and due to atypical operational errors. It is very clear the MID region is suffering sever reduction in the traffic growth which is keeping the estimation of overall risk in safe side.

2.8.12 Recommendations Applicable to Safety Objective 2:

a. The MIDRMA shall continue to encourage States to provide Large Height Deviation Reports (LHD) of all categories and not only related to handover issues.

b. Due to the failure of replying related LHD reports by some member states, the MIDRMA will upgrade the LHD online reporting system to alert states who failed to respond with the need to investigate and report their outcomes in the system itself as soon as possible.

c. The MIDRMA, in coordination with concerned States, assure that incidents and violations which have direct impact on the implementation of RVSM within the MID Region are reported in continuous basis through the MIDRMA LHD online reporting system in due time for operational safety assessment analysis.

2.9 ASSESSMENT OF SAFETY-RELATED ISSUES RAISED IN THIS REPORT

RVSM Safety Objective 3

Address any safety-related issues raised in the SMR by recommending improved procedures and practices; and propose safety level improvements to ensure that any identified serious or risk-bearing situations do not increase and, where possible, that they decrease. This should set the basis for a continuous assurance that the operation of RVSM will not adversely affect the risk of en-route mid-air collision over the years.

a. The MIDRMA improved its monitoring capabilities by conducting trial ADSB Height Keeping Performance for some RVSM approved aircraft registered by MIDRMA member states.

b. The MIDRMA started to build its database for the RVSM approved aircraft registered by MIDRMA member states which are capable of ADSB out to conduct height monitoring using AHMS (ADSB Height Monitoring System)

c. The MIDRMA started to address Performance-Based Communication and Surveillance (PBCS) approvals request from member states issuing PBCS approvals and forward reports received from other regions related none compliant of PBCS requirements.

d. The MIDRMA will address the Hot Spots of each MID FIR generated by the (MIDRAS) Software (for information only).

e. Current risk-bearing situations have been identified by using the MIDRAS and the MID Visualization and Simulation of Air Traffic and action will be taken to ensure resolving all violations to RVSM airspace by non-approved aircraft.

f. The MIDRMA continued to carry out scrutiny checks for aircraft filling W in their flight plans for all aircraft flying within the ICAO Middle East RVSM airspace and address all violating aircraft to the concerned authorities.

g. The MIDRMA arranged for an upgrade project to enhance the MIDRAS which will improve and facilitate the calculation of all RVSM risk parameters.

-It is concluded that this Safety Objective is currently met.

MID STATES RVSM AIRCRAFT MINIMUM MONITORING REQUIREMENTS

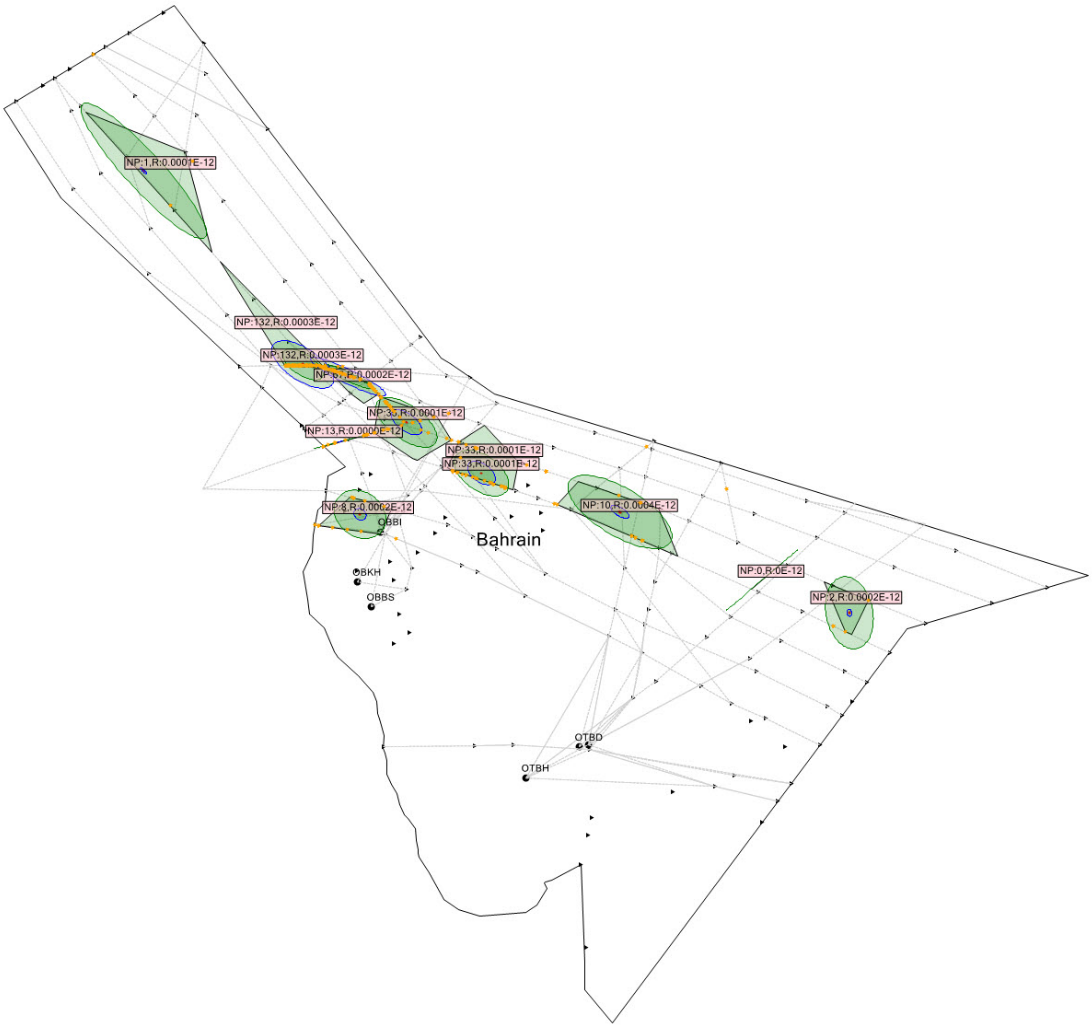
Valid as of 31st December 2021

MID STATES	RVSM APPROVED A/C	HAVE RESULTS OR COVERED	NOT COVERED	NOT COVERED IN %	A/C MMR
Bahrain	60	60	0	0%	**0**
Egypt	156	113	43	28%	**27**
Iran	249	138	111	45%	**36**
Iraq	43	43	0	0%	**0**
Jordan	44	40	4	9%	**4**
KSA	259	257	2	0.8%	**2**
Kuwait	70	64	6	9%	**5**
Lebanon	32	32	0	0%	**0**
Libya	31	9	22	71%	**15**
Oman	72	63	9	13%	**3**
Qatar	276	276	0	0%	**0**
Sudan	10	10	0	0%	**0**
Syria	15	0	15	100%	**9**
UAE	584	529	55	9%	**24**
Yemen	5	0	5	100%	**5**
TOTAL	**1906**	**1635**	**271**	**14.22%**	**130**

Appendix B

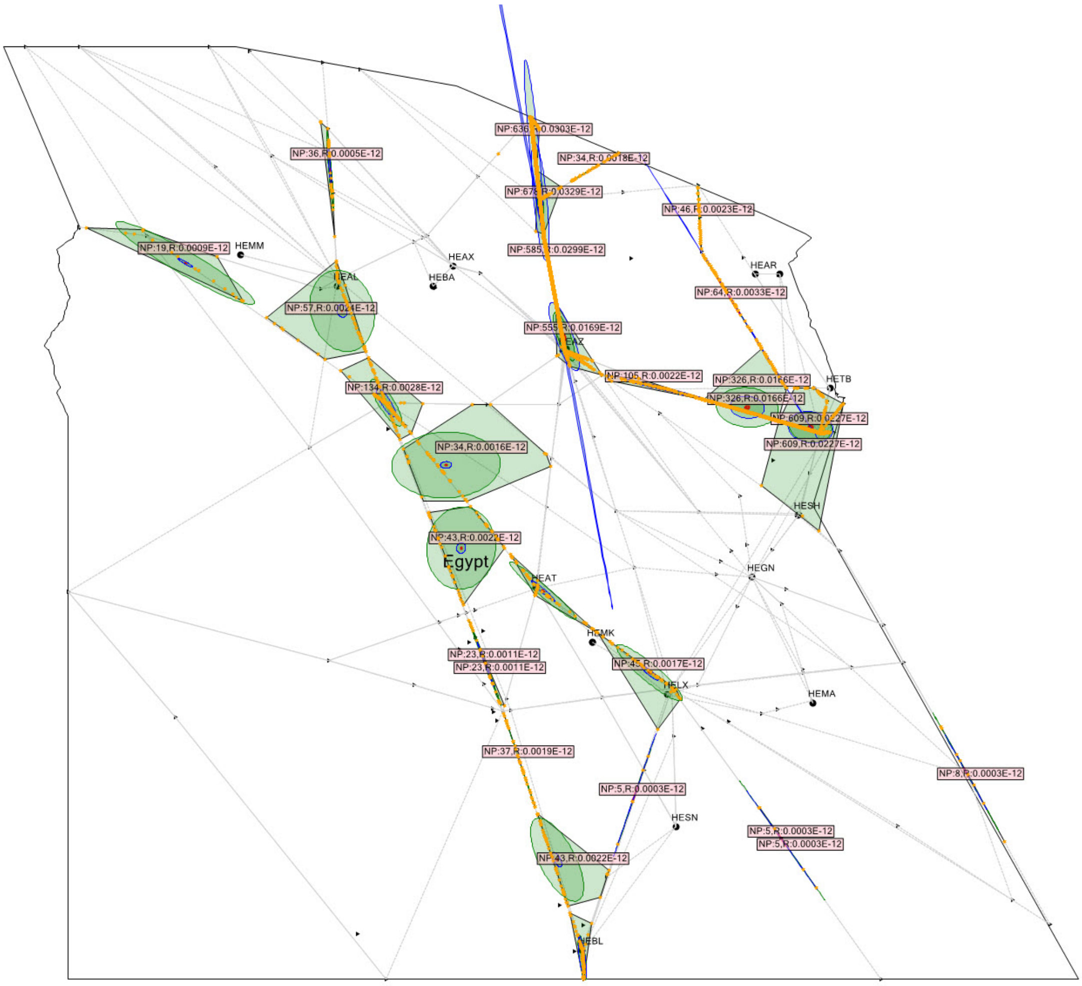
MIDRMA Member States Hot Spots Generated from July 2021 TDS

(For information ONLY)



Bahrain FIR

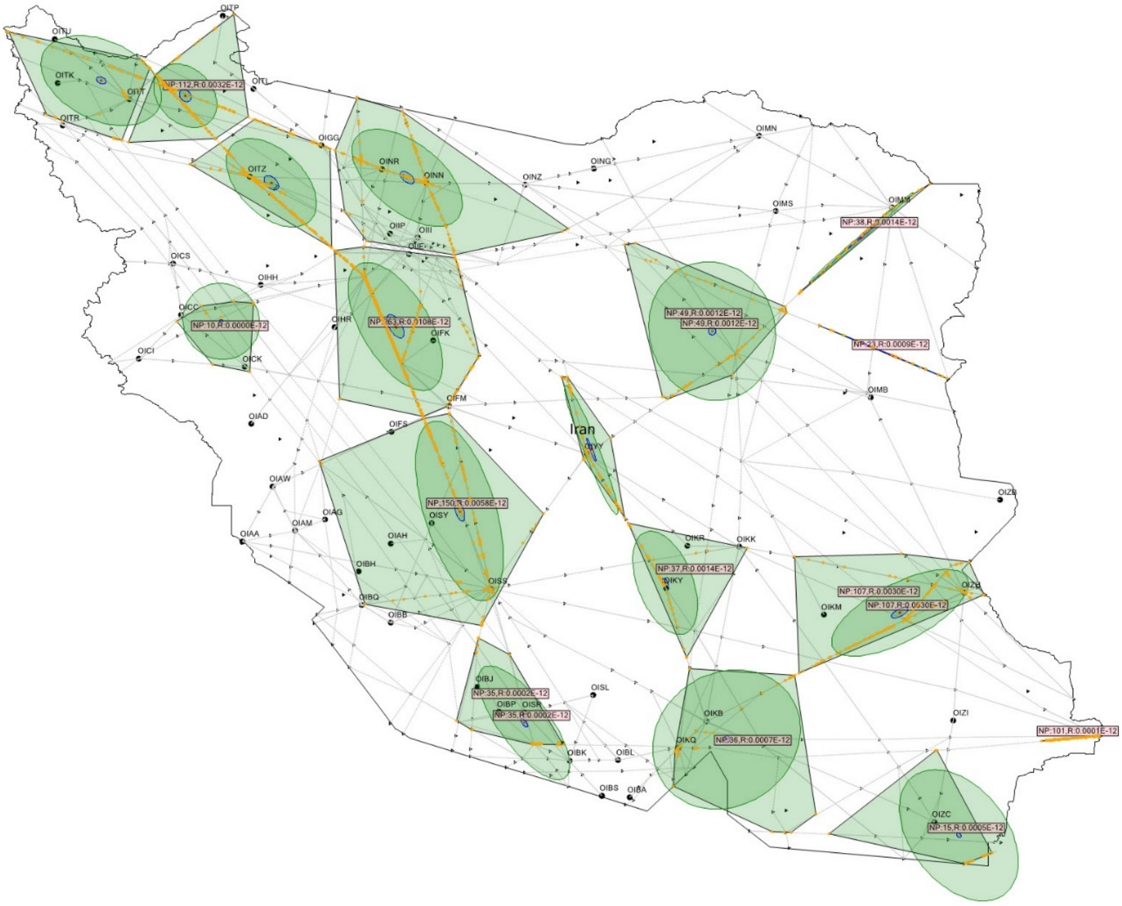
3E-18



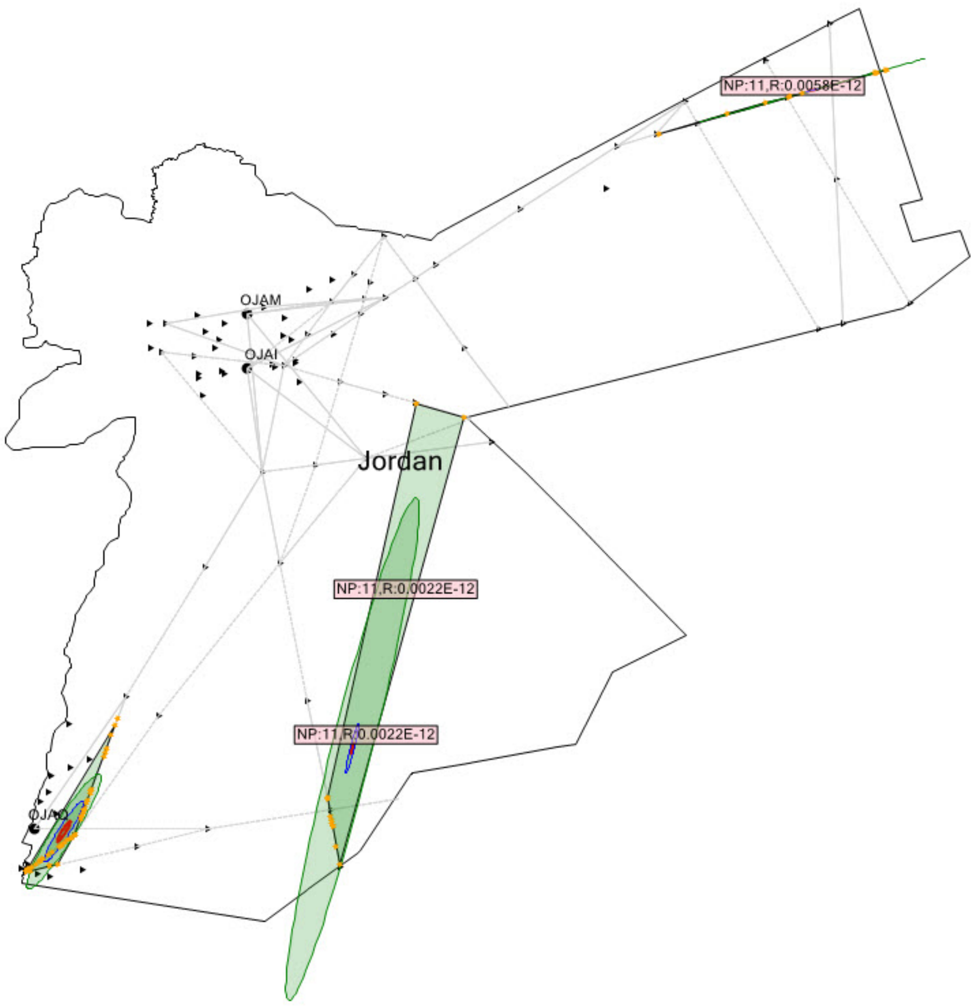
Cairo FIR


NP:28,R:6.4966E-12
NP:28,R:6.4966E-12
ORBM
ORER
NP:16,R:2.3710E-12
ORKK
ORSU
NP:6,R:0.7945E-12
NP:6,R:0.7945E-12
ORBD
ORAA
NP:135,R:20.4429E-12
NP:91,R:13.6846E-12
NP:135,R:20.4429E-12
ORAT
ORBI
Iraq
NP:3,R:0.3196E-12
NP:3,R:0.3196E-12
NP:2,R:0.5184E-12
ORNI
NP:0,R:0E-12
ORTL
NP:7,R:1.5609E-12
NP:7,R:1.5609E-12
ORMM
NP:0,R:0E-12

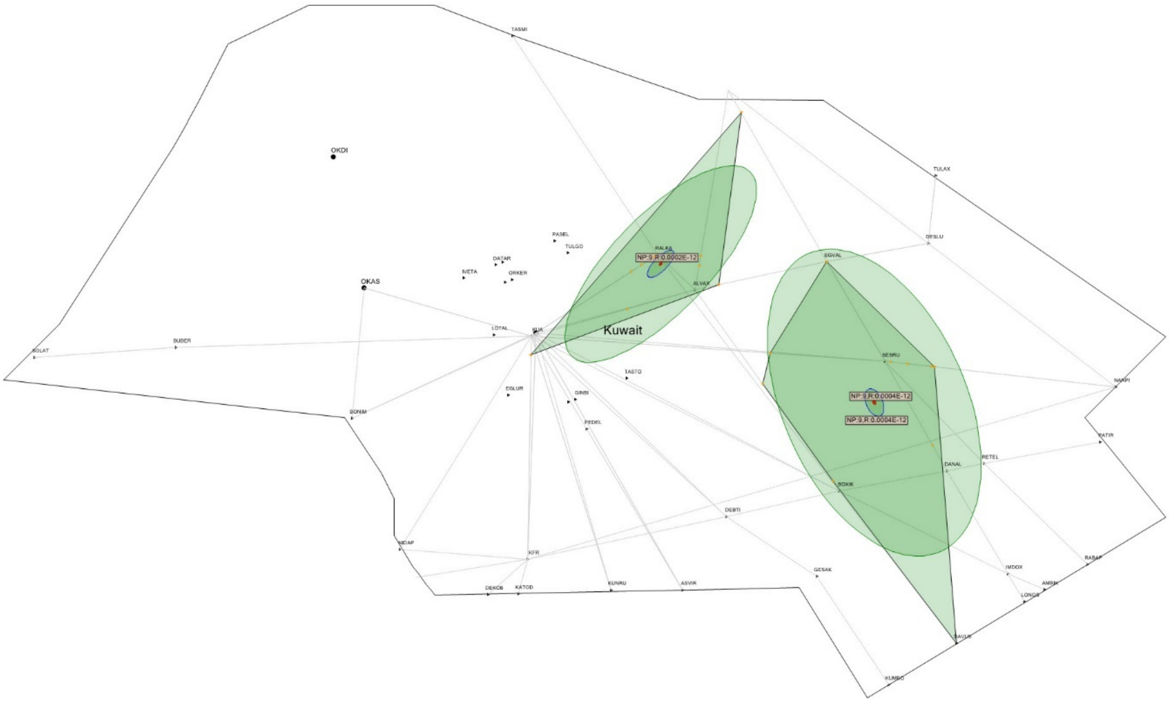
BAGHDAD FIR


Iran
NP:112,R:0.0032E-12
NP:38,R:0.0014E-12
NP:10,R:0.0000E-12
NP:49,R:0.0012E-12
NP:21,R:0.0009E-12
NP:150,R:0.0058E-12
NP:37,R:0.0014E-12
NP:107,R:0.0030E-12
NP:35,R:0.0002E-12
NP:36,R:0.0007E-12
NP:101,R:0.0001E-12
NP:15,R:0.0005E-12

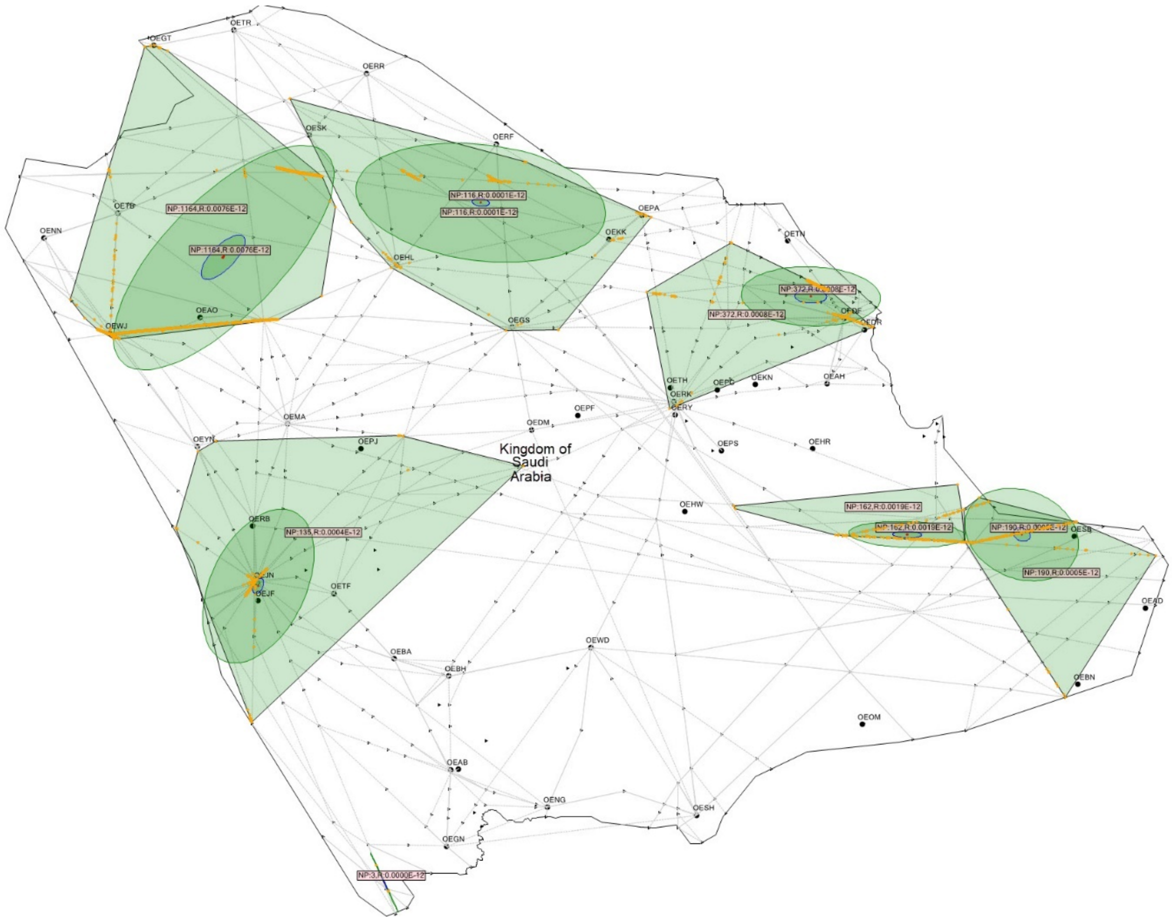
TEHRAN FIR


NP:11,R:0.0058E-12
OJAM
OJAI
Jordan
NP:11,R:0.0022E-12
NP:11,R:0.0022E-12
OJAQ

AMMAN FIR


TASMI
OKDI
OKAS
PASEL
TULGO
DATAR
IVETA
ORKER
LOTAL
KUA
BUBER
SOLAT
BONIM
EGLUR
GINBI
PEDEL
TASTO
NIDAP
KFR
DEKOB
KATOD
KUNRU
ASVIR
DEBTI
GESAK
KUMBO
RALKA
NP:9,R:0.0002E-12
ALVAX
Kuwait
TULAX
DESLU
EGVAL
SESRU
NANPI
NP:9,R:0.0004E-12
NP:9,R:0.0004E-12
PATIR
RETEL
DANAL
BOXIK
IMDOX
RABAP
AMBIK
LONOS

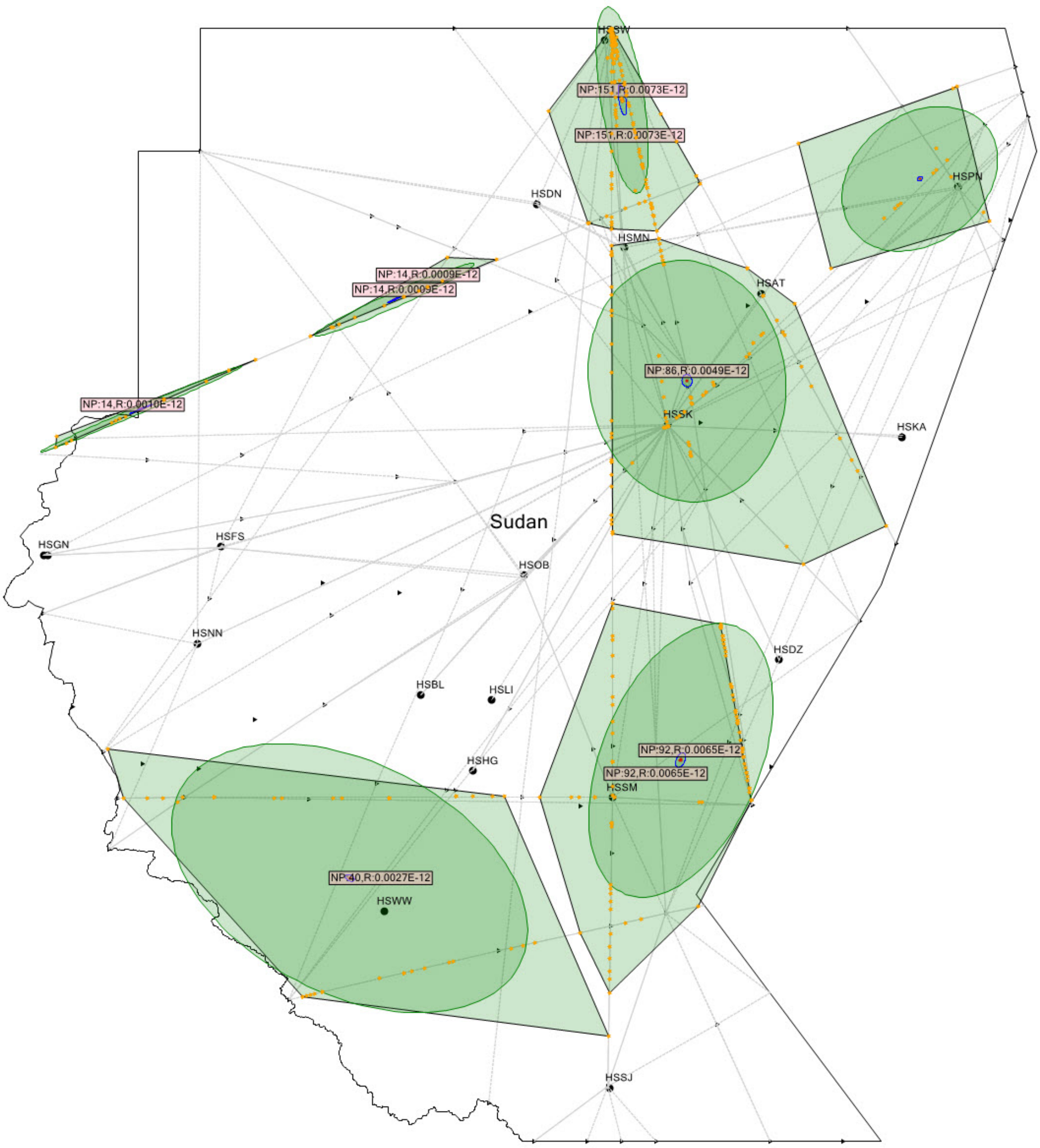
KUWAIT FIR


Kingdom of Saudi Arabia
NP:1164,R:0.0076E-12
NP:116,R:0.0001E-12
NP:372,R:0.0008E-12
NP:135,R:0.0004E-12
NP:162,R:0.0019E-12
NP:190,R:0.0005E-12
OEGT
OETR
OERR
OESK
OERF
OEPA
OEKK
OEHL
OEGS
OETB
OENN
OEAO
OEWJ
OEMA
OEYN
OEPJ
OEDM
OEPF
OETH
OERK
OERY
OEKN
OEAH
OEPS
OEHR
OEHW
OERB
OEJF
OETF
OEBA
OEBH
OEWD
OEAB
OENG
OESH
OEGN
OEOM
OEBN
OETN

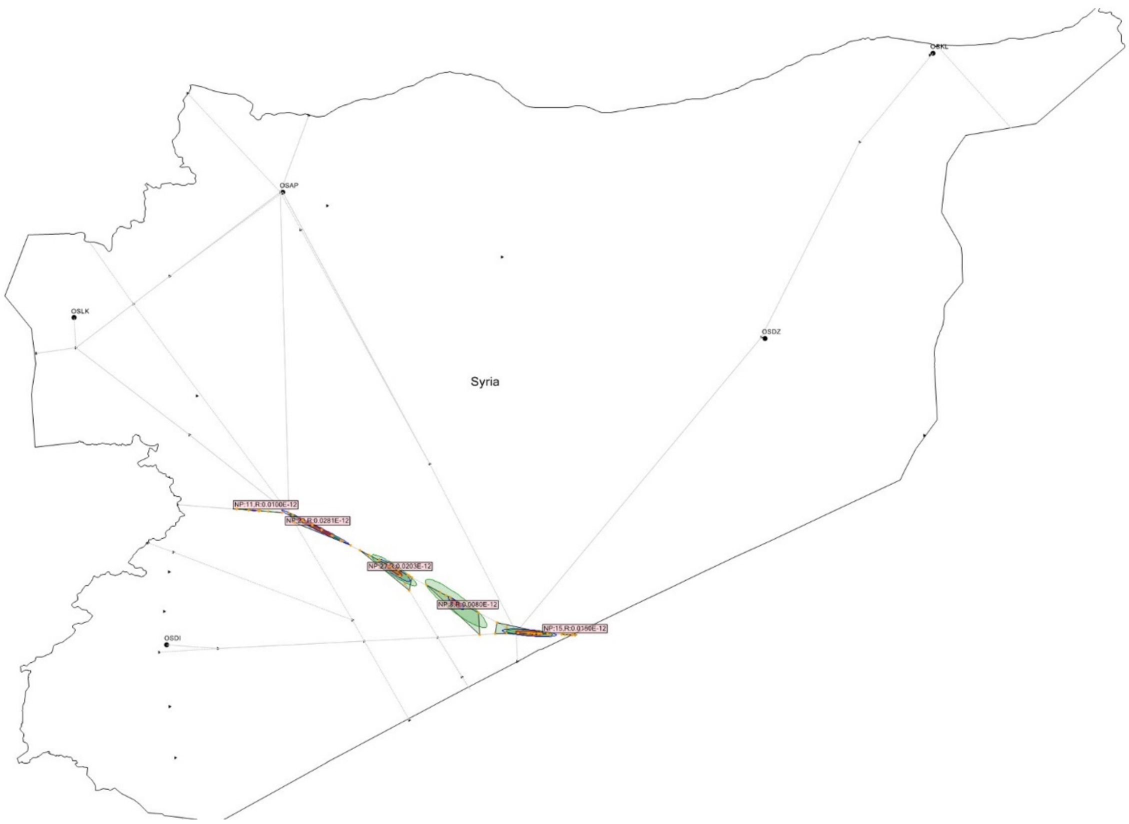
JEDDAH FIR


OOSH
OOMN
OOMS
NP:196,R:0.0001E-12
NP:196,R:0.0001E-12
NP:572,R:0.0006E-12
NP:8,R:0.0000E-12
NP:471,R:0.0014E-12
NP:218,R:0.0003E-12
NP:211,R:0.0004E-12
NP:171,R:0.0005E-12
NP:110,R:0.0001E-12
OOFD
NP:140,R:0.0005E-12
NP:140,R:0.0005E-12
OOGB
Oman
NP:120,R:0.0004E-12
NP:167,R:0.0005E-12
OOMA
OODQ
OOMK
NP:63,R:0.0001E-12
OOMX
OOTH
OOSA
NP:195,R:0.0005E-12
NP:195,R:0.0005E-12

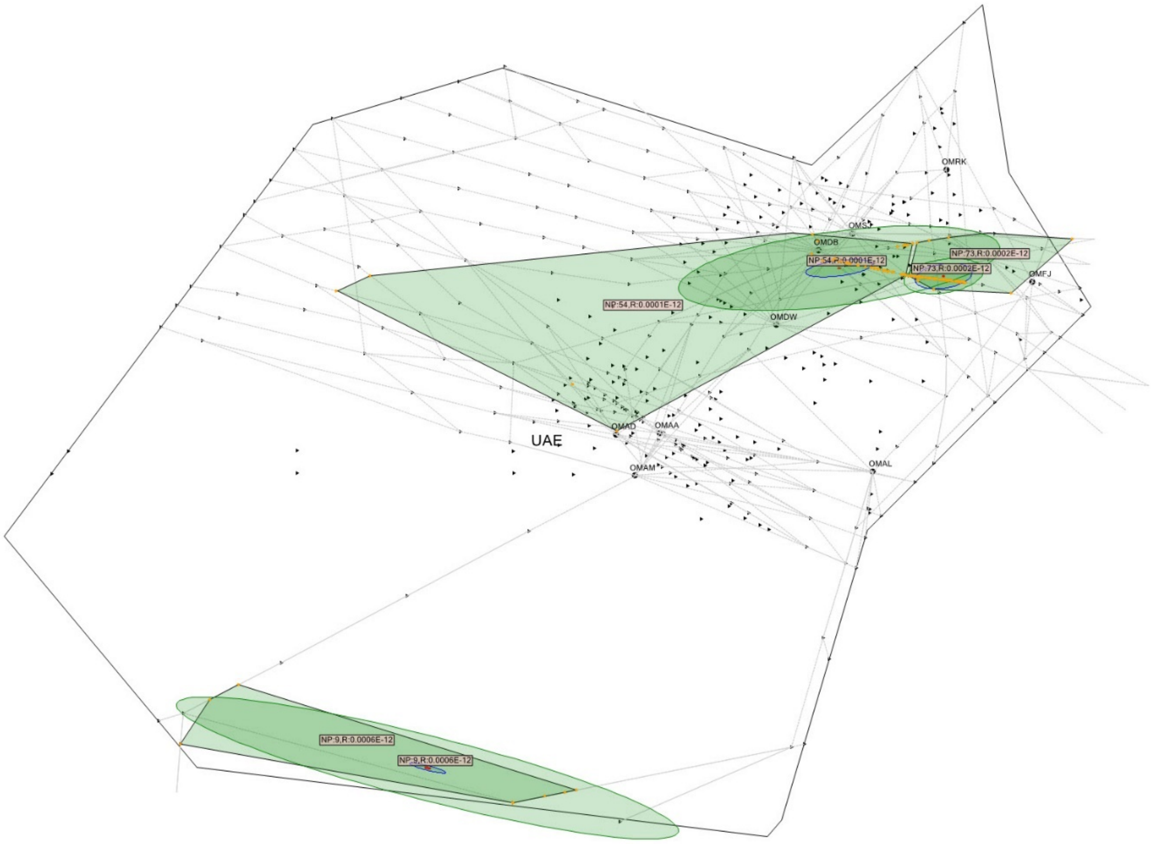
MUSCAT FIR



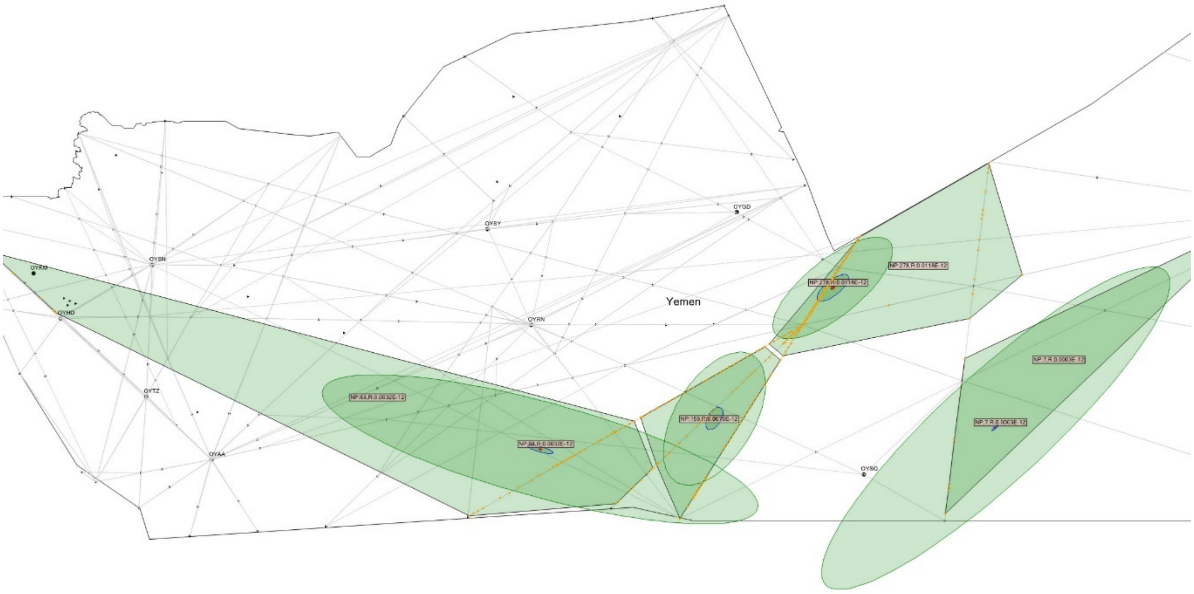
KHARTOUM FIR



DAMASCUS FIR



EMIRATES FIR


OYGD
OYSY
OYSN
OYKM
OYHD
Yemen
OYRN
OYTZ
OYAA
OYSQ
NP:68,R:0.0032E-12

SANA'A FIR

GADS-B1/2: Contact Directory Service

Main Purpose: To ensure that Point of Contact (PoC) information is available and can be accessed by Rescue Coordination Centres (RCCs), ATSUs and aircraft operators in support of emergency situations.

Description: Point of Contact repository is part of the Global Aeronautical Distress and Safety System (GADSS) and is used to enable timely contact between the persons relevant to an emergency situation involving an aircraft in a specified area.

State	GADSS PoC	Job Title / ORG	Email address	Telephone	Mobile phone
Bahrain	Mr. Ahmed Al Shamlan	Head of Search & Rescue Air Navigation Directorate	ahmed.alshamlan@mtt.gov.bh; bahrainsar@mtt.gov.bh	+973 17329969 / 9959	
Egypt	Mr. Hesham Abdel Basset Abdel Aziz	GM, Crisis Management	crimang@civilaviation.gov.eg	+202 2267 7617	+2011 41130557
Iran					
Iraq					
Jordan	Mr. Ali Taleb	Chief of Amman TACC & RCC	ali.taleb@carc.gov.jo	+962 64799120/5689	+962 799766728
Kuwait					
Lebanon					
Libya					
Oman					

State	GADSS PoC	Job Title / ORG	Email address	Telephone	Mobile phone
Qatar					
Saudi Arabia	Mr. Fahad Saud Alharbi	Head of Aeronautical Search & Rescue Center / SANS	Fasalharbi@sans.com.sa	+966115253779	+966505329284
Sudan	Mr. Hashim Basheer	Head of SAR	Berger124@gmail.com hashim_sar@scaa.gov.sd HSSSYCYX	+249123179582 +249912382433	+249922382433 +249123277979
Syria					
UAE	Mr. Omar Al Abdouli	Senior Manager / Air Traffic Operations	oabdouli@szc.gcaa.ae	+971-2-599-6910	+971-56-688-2438
Yemen					

MONITORING THE IMPLEMENTATION OF THE PRIORITY 1 ASBU THREADS/ELEMENTS (Block 0 & 1 IN THE MID REGION

Element		**Applicability**	**Performance Indicators/ Supporting Metrics**	**Targets**	**Timelines**
Information Threads					
DAIM					
DAIM B1/1	Provision of quality-assured aeronautical data and information	All States	Indicator*: Regional average implementation status of DAIM B1/1 (provision of quality-assured aeronautical data and information). Supporting Metrics: 1. Number of States that have implemented QMS for AIS/AIM 2. Number of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) and have implemented WGS-84 Geoid Undulation 3. Number of States that are compliant with the requirements of AIRAC adherence, 4. Number of States that have implemented an AIXM-based AIS database (AIXM V5.1+) 5. Number of States that have established formal arrangements with at least 50% of their AIS data originators.	80%	Dec 2021
DAIM B1/3	Provision of digital terrain data sets	All States	Indicator*: Regional average implementation status of DAIM B1/3(Provision of Terrain digital datasets). Supporting Metric: Number of States that provide required Terrain digital datasets	60%	Dec 2021
DAIM B1/4	Provision of digital obstacle data sets	All States	Indicator*: Regional average implementation status of DAIM B1/4(Provision of obstacle digital datasets). Supporting Metric: Number of States that provide required obstacle digital datasets	60 %	Dec 2021
AMET					

Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
AMET B0/1	Meteorological observations products	All states	Indicator*: Regional average implementation status of B0/1 (Meteorological observations products). Supporting Metrics: Number of States that provide the following Meteorological observations products, as required: 1. Automatic Weather Observation System (AWOS) information (including real-time exchange of wind and RVR data) 2. Local reports (MET REPORT/SPECIAL) 3. Aerodrome reports (METAR/SPECI) 4. Lightning Information 5. Ground-based weather radar information 6. Meteorological satellite imagery 7. Aircraft meteorological report (ie. ADS-B, AIREP, etc.) 8. Vertical wind and temperature profiles 9. Wind shear alerts	80%	Dec 2021
AMET B0/2	Meteorological forecast and warning products	All states	Indicator*: Regional average implementation status of B0/2 (Meteorological forecasts and warning products) Supporting Metrics: Number of States that provides the following Meteorological forecast and warning products, as required: 1. World Area Forecast System (WAFS) gridded products 2. Significant Weather (SIGWX) 3. Aerodrome Forecast (TAF) 4. Trend Forecast (TREND) 5. Take-off Forecast 6. SIGMET 7. Aerodrome Warning 8. Wind Shear Warning	90%	Dec 2021
AMET B0/3	Climatological and historical meteorological products	All states	Indicator: % of States that provide Climatological and historical meteorological products, as required. Supporting Metric: Number of States that provide Climatological and historical meteorological products, as required	85%	Dec 2021

Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
AMET B0/4	Dissemination of meteorological products	All states	Indicator: % of States disseminating Meteorological products using a variety of formats and means (TAC, Gridded, Graphical, BUFR code, IWXXM) Supporting Metric: Number of States disseminating Meteorological products using a variety of formats and means (TAC, Gridded, Graphical, BUFR code, IWXXM)	85%	Dec 2021
FICE					
FICE B0/1	Automated basic inter facility data exchange (AIDC)	According to the MID Region AIDC/OLDI Priority 1 Applicability Area at Attachment A	Indicator*: % of priority 1 AIDC/OLDI Interconnection have been implemented Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70%	Dec 2020
Operational Threads					
APTA					
APTA B0/1	PBN Approaches (with basic capabilities)	All RWYs ENDs at International Aerodromes	Indicator: % of Runway ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) Supporting metric: Number of Runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	100%	Dec 2017
APTA B0/2	PBN SID and STAR procedures (with basic capabilities)	All RWYs ENDs at International Aerodromes	Indicator: % of Runway ends at international aerodromes provided with PBN SID and STAR (basic capabilities). Supporting Metric: Number of Runway ends at international aerodromes provided with PBN SID and STAR (basic capabilities).	70%	Dec 2022
APTA B0/4	CDO (Basic)	OBBI, OIIE, OIKB, OIFM, OJAI, OLBA, OOMS, OTHH, OTBD, OEJN, OEMA, OEDF, OERK, HSSS,	Indicator*: % of International Aerodromes with CDO implemented as required. Supporting Metric: Number of International Aerodromes with CDO implemented as required.	100%	Dec 2021

Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
		HSPN, OMAA, OMAL, OMAD, OMDW, OMDB, OMSJ, OMRK and OMFJ	*As per the applicability area		
APTA B0/5	CCO (Basic)	OBBI, OIIE, OIKB, OIFM, OJAI, OLBA, OOMS, OTHH, OTBD, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMAL, OMAD, OMDW, OMDB, OMSJ, OMRK and OMFJ	Indicator*: % of International Aerodromes with CCO implemented as required. Supporting Metric: Number of International Aerodromes with CCO implemented as required. *As per the applicability area	100%	Dec 2021
APTA B0/7	Performance based aerodrome operating minima – Advanced aircraft	All States	Indicator: % of States authorizing Performance-based Aerodrome Operating Minima for Air operators operating Advanced aircraft. Supporting Metric: Number of States authorizing Performance-based Aerodrome Operating Minima for Air operators operating Advanced aircraft.	50%	Dec 2021
FRTO					
FRTO B0/2	Airspace planning and Flexible Use of Airspace (FUA)	Bahrain, Egypt, Jordan, Qatar, Saudi Arabia (2 ACCs), Sudan, UAE	Indicator*: % of ACCs using and implementing appropriate means (procedures and tools (automation)) to support Airspace planning and FUA and improve data exchange between Civil and Military to improve efficiency of Airspace. Supporting metric: Number of ACCs using and implementing appropriate means (procedures and tools (automation)) to support Airspace planning and FUA and improve data exchange between Civil and Military to improve efficiency of Airspace. * As per the applicability area	50% **Level 1:** 5 States fully implemented 10 Other states not implemented yet **Level 2:** 4 State fully 1 state partially and 10 states not **Level 3:** 3 states fully 1 state partially 11 states not	Dec 2022

Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
FRTO B0/4	Basic conflict detection and conformance monitoring	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia (2 ACCs), Sudan, UAE	Indicator*: % States that implemented MTCD and MONA, for ACCs, as required. Supporting metric: The number of States that implemented MTCD and MONA for ACCs, as required. * As per the applicability area	70%	Dec 2021
NOPS					
NOPS B0/1	Initial integration of collaborative airspace management with air traffic flow management	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE	Indicator*: % of States implementing ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace management and air traffic flow and capacity management process Supporting metric: number of States implementing ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace management and air traffic flow and capacity management process. * As per the applicability area	50% 2 states implemented 2 states on going 11 states not implemented	Dec 2022
ACAS					
ACAS B1/1	ACAS Improvements Operational	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	100%	Dec 2017
SNET					
SNET B0/1	Short Term Conflict Alert (STCA)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman,	Indicator*: % of States that have implemented Short-term conflict alert (STCA)	80 %	Dec 2018

Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
		Qatar, Saudi Arabia, Sudan, UAE	Supporting metric: number of States that have implemented Short-term conflict alert (STCA) * As per the applicability area	80 %	
SNET B0/2	Minimum Safe Altitude Warning (MSAW)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE	Indicator*: % of States that have implemented Minimum safe altitude warning (MSAW) Supporting metric: number of States that have implemented Minimum safe altitude warning (MSAW) * As per the applicability area	80 % 80 %	Dec 2018
SNET B0/3	Area Proximity Warning (APW)	Bahrain, Egypt, Iran, Iraq, Kuwait, Jordan, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE	Indicator*: % of States that have implemented Area Proximity Warning (APW) for ACCs, as required Supporting metric: number of States that have Implemented Area Proximity Warning (APW) for ACCs, as required * As per the applicability area	70%	Dec 2021
GADS					
GADS B1/2	Contact directory service	All States	Indicator: % of States that provided GADSS Point of Contact (PoC) information Supporting Metric: Number of States that provided GADSS Point of Contact (PoC) information	100%	Dec 2021
RSEQ					
RSEQ B0/1	Arrival Management	OBBI, HECA, HEBA, HELX, HESN, HESH, OTBD, OTHH, OEJN, OEDF, OEMA, OERK OMDB, OMAA	Indicator*: % of Aerodromes that have implemented arrival manager (AMAN), where required/applicable Supporting Metric: Number of Aerodrome that have implemented arrival manager (AMAN), where required/ applicable * As per the applicability area	80%	Dec 2022
SURF					

Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
SURF-B0/1	Basic ATCO tools to manage traffic during ground operations	All International Aerodromes	Indicator: % of Aerodromes having implemented Basic ATCO tools to manage traffic during ground operations Supporting metric: Number of Aerodromes having implemented Basic ATCO tools to manage traffic during ground operations	100%	Dec 2021
SURF-B0/2	Comprehensive situational awareness of surface operations	OBBI, HECA, OIII, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OEMA, OMDB, OMAA.	Indicator*: % of Airports having implemented the surveillance service of A-SMGCS Supporting metric: Number of Airports having implemented the surveillance service of A-SMGCS * As per the applicability area	80%	Dec 2021
SURF-B0/3	Initial ATCO alerting service for surface operations	OBBI, HECA, OIII, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OEMA, OMDB, OMAA.	Indicator*: % of Airports having implemented the A-SMGCS alerting service. Supporting metric: Number of Airports having implemented the A- SMGCS alerting service * As per the applicability area	80%	Dec 2021
ACDM					
ACDM B0/1	Airport CDM Information Sharing (ACIS)	OBBI, OIII, OKBK, OOMS, OTHH, OEJN, OERK, OMDB, OMAA	Indicator*: % of Airports having implemented ACIS Supporting metric: number of Airports having implemented ACIS * As per the applicability area	50%	Dec 2021
ACDM B0/2	Integration with ATM Network function	OBBI, OIII, OKBK, OOMS, OTHH, OEJN, OERK, OMDB, OMAA.	Indicator*: % of Airports having integrated ACDM with the ATM Network function. Supporting metric: Number of Airports having integrated ACDM with the ATM Network function * As per the applicability area	50%	Dec 2022
ACDM B1/1	Airport Operations Plan (AOP)	OBBI, OIII, OKBK, OOMS, OTHH, OEJN,	Indicator*: % of Airports having implemented an Airport Operations Plan (AOP)	50%	Dec 2021

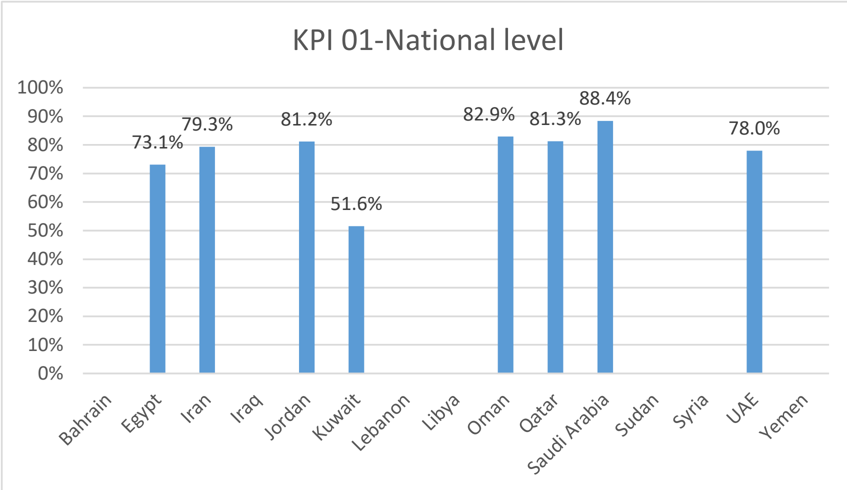
Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
		OERK, OMDB, OMAA.	Supporting metric: having implemented an Airport Operations Plan (AOP) * As per the applicability area		
Technology Threads					
ASUR					
ASUR B0/1	Automatic Dependent Surveillance – Broadcast (ADS-B)	(Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Saudi Arabia, Qatar, Sudan, UAE)	Indicator*: % of States that have implemented ADS-B to improve surveillance coverage/capabilities Supporting Metric: Number of States that have implemented ADS-B to improve surveillance coverage/capabilities * As per the applicability area	80%	Dec 2022
ASUR B0/2	Multilateration cooperative surveillance systems (MLAT)	Bahrain, Egypt, Jordan, Kuwait, Oman, Saudi Arabia, Qatar, UAE	Indicator*: % of States that have implemented Multi-lateration (M-LAT) Supporting Metric: Number of States that have implemented Multi-lateration (M-LAT) * As per the applicability area	80%	Dec 2022
ASUR B0/3	Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)	Bahrain, Egypt, Iran, Iraq, Kuwait, Lebanon, Jordan, Oman, Qatar, Saudi Arabia, Sudan and UAE	Indicator*: % of States that have implemented Downlink of Aircraft Parameters (SSR-DAPS) Supporting Metric: Number of States that have implemented Downlink of Aircraft Parameters (SSR-DAPS) * As per the applicability area	80%	Dec 2021
NAVS					
NAVS B0/3	Aircraft Based Augmentation Systems (ABAS)	All States	Indicator: % of States requiring Aircraft Based Augmentation System (ABAS) equipage for aircraft with a max certificated take-off mass greater than 5,700 Kg to enable PBN Operations Supporting metric: Number of States requiring Aircraft Based Augmentation System (ABAS) equipage for aircraft with a max certificated take-off mass greater than 5,700 Kg to enable PBN Operations	70%	Dec 2021

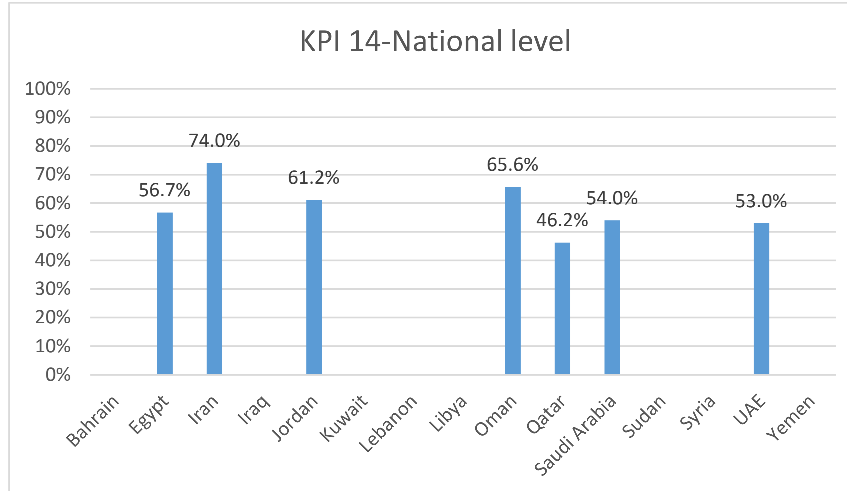
Element		Applicability	Performance Indicators/ Supporting Metrics	Targets	Timelines
NAVS B0/4	Navigation Minimal Operating Networks (Nav. MON)	All States	Indicator: % of States that have developed a plan of rationalized conventional NAVAIDS network to ensure the necessary levels of resilience for navigation Supporting metric: Number of States that have developed a plan of rationalized conventional NAVAIDS network to ensure the necessary levels of resilience for navigation	70%	Dec 2022
COMI					
COMI B0/7	ATS Message Handling System (AMHS)	All States	Indicator: % of States that have established AMHS interconnections with adjacent COM Centres Supporting metric: Number of States that have established AMHS interconnections with adjacent COM Centres	90%	Dec 2020
COMI B1/1	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS)	All States	Indicator: % of States that have established National IP Network for voice and data communication Supporting metric: Number of States that have established National IP Network for voice and data communication	80%	Dec 2021

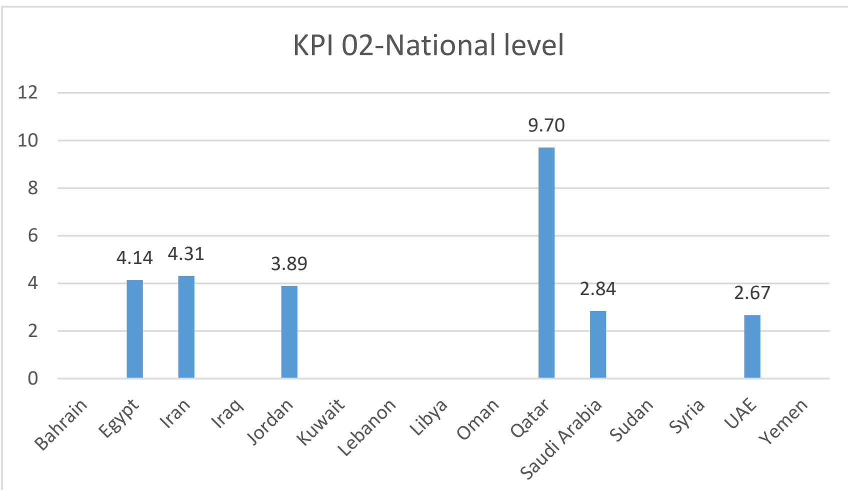
To complete this table please consider the following points:	
1)	data is required for each Aerodrome in column "B"
2)	for States having more than one aerodrome, data is required for each aerodrome separately
3)	in column "C" the total number of Departures for the month of June 2021 is required for the calculation of KPI 01
4)	in column "D" we need the result of your calculation in percentage (based on the KPI 01 sheet)
5)	in column "E" you don't need to take any action
6)	in column "F" the total number of Arrivals for the month of July 2021 is required for the calculation of KPI 14
7)	in column "G" we need the result of your calculation in percentage (based on the KPI 14 sheet)
8)	in column "H" you don't need to take any action
9)	in column "I" the total number of Departures for the month of June 2021 is required for the calculation of KPI 02
10)	in column "J" the reference taxi-out time is needed for each Aerodrome for the calculation of the Taxi-out additional time in column "K"
11)	in column "K" we need the result of your calculation in minutes per flight (based on the KPI 02 sheet)
12)	in column "L" you don't need to take any action
13)	in column "M" the total number of Arrivals for the month of July 2021 is required for the calculation of KPI 13
14)	in column "N" the reference taxi-in time is needed for each Aerodrome for the calculation of the Taxi-in additional time in column "O"
15)	in column "O" we need the result of your calculation in minutes per flight (based on the KPI 13 sheet)
16)	in column "P" you don't need to take any action

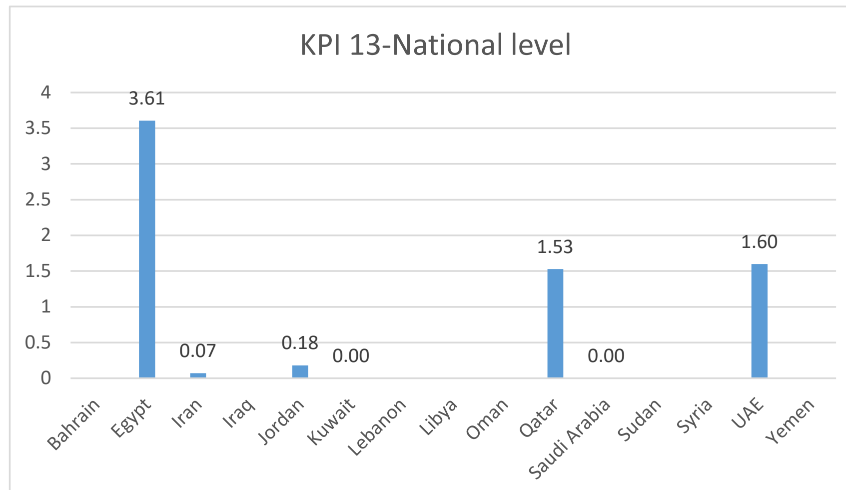
KPI (KPAs)	Title / Definition	Measurement Units	Variants	Data Requirement	Formula / Algorithm	Data collection Timeframe
KPI 01	**Departure punctuality** Percentage of flights departing from the gate on-time (compared to schedule).	% of flights	Variant 2A – % of departures within ± 15 minutes of scheduled time of departure	For each departing scheduled flight: - List of all IFR scheduled departure for each international aerodrome - Scheduled time of departure (STD) or Scheduled off-block time (SOBT) - Actual off-block time (AOBT)	**At the level of individual flights:** 1. Exclude non-scheduled departures 2. Categorize each scheduled departure as on-time or not **At aggregated/National level:** 3. Compute the KPI: number of on-time departures divided by total number of IFR scheduled departures	1 month (June 2021)
KPI 02	**Taxi-out additional time** Actual taxi-out time compared to an unimpeded/reference taxi-out time.	Excess taxi-out time in Minutes/flight	Variant 1 – basic (computed without departure gate and runway data)	For each departing flight: -List of all IFR departures for each international aerodrome - Actual off-block time (AOBT) - Actual take-off time (ATOT)	**At the level of individual flights:** 1. Select departing flights, exclude helicopters 2. Compute actual taxi-out duration: ATOT minus AOBT 3. Compute additional taxi-out time: actual taxi-out duration minus unimpeded/reference taxi-out time **At aggregated/National level:** 4. Compute the KPI: sum of additional taxi-out times divided by number of IFR departures	1 month (June 2021)
KPI 13	**Taxi-in additional time** Actual taxi-in time compared to an unimpeded/reference taxi-in time	Excess taxi-in time in Minutes/flight	Variant 1 – basic (computed without landing runway and arrival gate data)	For each arriving flight: - List of all IFR scheduled Arrivals for each international aerodrome - Actual landing time (ALDT) - Actual in-block time (AIBT)	**At the level of individual flights:** 1. Select arriving flights, exclude helicopters 2. Compute actual taxi-in duration: AIBT minus ALDT 3. Compute additional taxi-in time: actual taxi-in duration minus unimpeded/reference taxi-in time **At aggregated/National level:** 4. Compute the KPI: sum of additional taxi-in times divided by number of IFR arrivals	1 month (July 2021)
KPI 14	**Arrival punctuality** Percentage of flights arriving at the gate on-time (compared to schedule)	% of flights	Variant 2A – % of arrivals within ± 15 minutes of scheduled time of arrival	For each arriving scheduled flight: - List of all IFR scheduled arrival for each international aerodrome - Scheduled time of arrival (STA) or Scheduled in-block time (SIBT) - Actual in-block time (AIBT)	**At the level of individual flights:** 1. Exclude non-scheduled arrivals 2. Categorize each scheduled arrival as on-time or not **At aggregated/National level:** 3. Compute the KPI: number of on-time arrivals divided by total number of scheduled arrivals	1 month (July 2021)

States	AD	KPI 01 (Departure punctuality) Total no of DEPs	AD KPI 01 (%)	No of flights meeting KPI01	KPI 14 (Arrival punctuality) Total no of ARRs	AD KPI 14 (%)	No of flights meeting KPI14	KPI 02 (Taxi-out Additional Time) Total no of DEPs	unimpeded/reference taxi out time	AD KPI 02 (min)	Total minutes of delay	KPI 13 (Taxi-in Additional Time) Total no of ARRs	unimpeded/reference taxi in time	AD KPI 13	No of flight affected	Status
Bahrain	OBBI			0.00			0.00				0.00				0.00	not provided
Egypt	HECA	4011	76.71%	3076.84	4794	52.00%	2492.88	4011		4.43	17768.73	4794		2.15	10307.10	completed
	HEBA	415	70.12%	291.00	630	63.81%	402.00	415		5.65	2344.75	630		8.10	5103.00	completed
	HESH	767	69.75%	534.98	780	70.13%	547.01	767		3.13	2400.71	780		7.97	6216.60	completed
	HEGN	996	65.76%	654.97	1238	57.19%	708.01	996		3.38	3366.48	1238		4.82	5967.16	completed
	HELX	109	55.05%	60.00	92	84.78%	78.00	109		5.10	555.90	92		3.32	305.44	completed
	HESN	73	39.73%	29.00	83	74.70%	62.00	73		2.13	155.49	83		1.92	159.36	completed
	HEMA	160	78.10%	124.96	243	69.70%	169.37	160		2.82	451.20	243		1.20	291.60	completed
Iran	OIKB			0.00			0.00				0.00				0.00	not provided
	OIFM			0.00			0.00				0.00				0.00	not provided
	OIMM			0.00			0.00				0.00				0.00	not provided
	OISS			0.00			0.00				0.00				0.00	not provided
	OITT			0.00			0.00				0.00				0.00	not provided
	OIIE	1068	79.31%	847.03	1158	74.01%	857.04	1067		4.31	4598.77	1164		0.07	81.48	completed
	OIII			0.00			0.00				0.00				0.00	not provided
	OIZH			0.00			0.00				0.00				0.00	not provided
	OIYY			0.00			0.00				0.00				0.00	not provided
Iraq	ORBI			0.00			0.00				0.00				0.00	not provided
	ORMM			0.00			0.00				0.00				0.00	not provided
	ORER			0.00			0.00				0.00				0.00	not provided
	ORSU			0.00			0.00				0.00				0.00	not provided
	ORNI			0.00			0.00				0.00				0.00	not provided
	ORBM			0.00			0.00				0.00				0.00	not provided
Jordan	OJAI	1953	81.21%	1586.03	1951	61.15%	1193.04	1954	8	3.89	7601.06	1942	6	0.18	349.56	completed
	OJAQ			0.00			0.00				0.00				0.00	not provided
Kuwait	OKBK	1336	51.59%	689.24			0.00	1342	2	0.00	0.00				0.00	request data for KPI 13, KPI14
Lebanon	OLBA			0.00			0.00				0.00				0.00	not provided
Libya	HLLB			0.00			0.00				0.00				0.00	not provided
	HLLS			0.00			0.00				0.00				0.00	not provided
	HLLT			0.00			0.00				0.00				0.00	not provided
Oman	OOMS	3039	82.89%	2519.03	3213	65.61%	2108.05				0.00				0.00	request data for KPI 02, KPI 13
	OOSA			0.00			0.00				0.00				0.00	not provided
Qatar	OTBD			0.00			0.00				0.00				0.00	not provided
	OTHH	2746	83.94%	2304.99	2851	48.54%	1383.88	2872		3.86	11085.92	2873		1.15	3303.95	completed
Saudi Arabia	OEDF	2159	90.74%	1959.08	2333	54.78%	1278.02	2159			0.00	2159	15	0.45	971.55	KPI 13, Request reference time & the result of calculation in minutes per flight
	OEJN	4805	87.60%	4209.18	5220	64.96%	3390.91	4801			0.00	4805	16	2.18	10474.90	KPI 13, Request reference time & the result of calculation in minutes per flight
	OEMA	679	92.05%	625.02	705	64.96%	457.97	679			0.00	708	15	2.73	1932.84	KPI 13, Request reference time & the result of calculation in minutes per flight
	OERK	6121	87.80%	5374.24	6321	43.36%	2740.79	6124			0.00	6336	15	3.99	25280.64	KPI 13, Request reference time & the result of calculation in minutes per flight
Sudan	HSNN			0.00			0.00				0.00				0.00	not provided
	HSSS			0.00			0.00				0.00				0.00	not provided
	HSPN			0.00			0.00				0.00				0.00	not provided
Syria	OSAP			0.00			0.00				0.00				0.00	not provided
	OSLK			0.00			0.00				0.00				0.00	not provided
	OSDI			0.00			0.00				0.00				0.00	not provided
UAE	OMAA			0.00			0.00				0.00				0.00	not provided
	OMAD			0.00			0.00				0.00				0.00	not provided
	OMAL			0.00			0.00				0.00				0.00	not provided
	OMDB	6627	78.00%	5169.06	6717	53.00%	3560.01	6622		2.67	17680.74	6717		1.60	10747.20	completed
	OMDW			0.00			0.00				0.00				0.00	not provided
	OMFJ			0.00			0.00				0.00				0.00	not provided
	OMRK			0.00			0.00				0.00				0.00	not provided
	OMSJ			0.00			0.00				0.00				0.00	not provided
Yemen	OYAA			0.00			0.00				0.00				0.00	not provided
	OYHD			0.00			0.00				0.00				0.00	not provided
	OYRN			0.00			0.00				0.00				0.00	not provided
	OYSN			0.00			0.00				0.00				0.00	not provided
	OYTZ			0.00			0.00				0.00				0.00	not provided









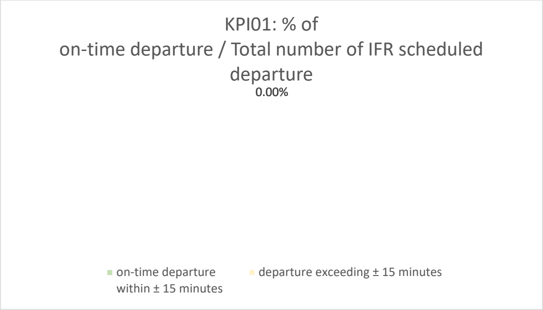
states	KPI 01	KPI 14	KPI 02	KPI 13
Bahrain				
Egypt	73.06%	56.73%	4.14	3.61

Iran	79.31%	74.01%	4.31	0.07
Iraq				
Jordan	81.21%	61.15%	3.89	0.18
Kuwait	51.59%			0.00
Lebanon				
Libya				
Oman	82.89%	65.61%		
Qatar	81.26%	46.20%	9.70	1.53
Saudi Arab	88.40%	53.97%	2.84	0.00
Sudan				
Syria				
UAE	78.00%	53.00%	2.67	1.60
Yemen				

	Total	on-time departure within ± 15 minutes	departure exceeding ± 15 minutes	KPI01
KPI01: % of on-time departure / Total number of IFR scheduled departure	0	0	0	#DIV/0!

Data Requirments

International AD	List of all IFR scheduled departure (CS)	Date (yyyy-mm-dd)	STD or SOBT (HHMM)	ATD or AOBT (HHMM)	ATD-STD or AOBT-SOBT (±Minutes)	within ± 15 minutes of scheduled time (Yes, No)



KPI02: Excess taxi-out time in Minutes / Total number of IFR departure = #DIV/0!

International AD	Runway	Apron	unimpeded/ Reference Taxi-out Time (Minutes)	List of all IFR scheduled departure (CS)	Date (yyyy-mm-dd)	AOBT (HHMM)	ATOT (HHMM)	Actual taxiout duration ATOT - AOBT (Minutes)	Additional (Excess) taxi-out time Actual Taxiout Duration - Reference Taxiout Time

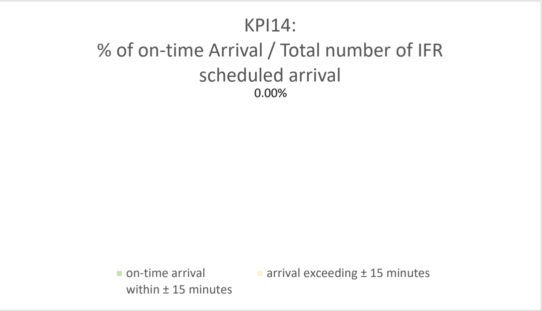
KPI13: Excess Taxi-In Time in Minutes / Total number of IFR arrival = #DIV/0!

International AD	Runway	Apron	Unimpeded/Reference Taxi in Time (Minutes)	List of all IFR scheduled arrival (CS)	Date (yyyy-mm-dd)	AIBT (HHMM)	ALDT (HHMM)	Actual taxi in duration AIBT - ALDT (Minutes)	Additional (Excess) Taxi-In Time Actual Taxi-In Duration - Reference Taxi-In Time

	Total	on-time arrival within ± 15 minutes	arrival exceeding ± 15 minutes	KPI01
KPI14: % of on-time Arrival / Total number of IFR scheduled arrival	1	0	0	0.00%

Data Requirments

International AD	List of all IFR scheduled arrival (CS)	Date (yyyy-mm-dd)	STA or SIBT (HHMM)	ATA or AIBT (HHMM)	ATA-STA or AIBT-SIBT (±Minutes)	within ± 15 minutes of scheduled time (Yes, No)



Deficiencies in the ATM field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	MID ANP TABLE ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS routes A418/UP574 not implemented	Dec 2006	KUMUN-PAPAR segment not implemented.	S O	Corrective Action Plan has not been formally provided by the State	Iran- UAE	Dec 2021	B

Deficiencies in the ATM field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G667 not implemented	Sep 2006	Segment ALSAN-ABD not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq- Iran-Kuwait	Dec 2021	B
2	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or	Nov 2006	Contingency Agreement to be signed with Syria	S	Corrective Action Plan has not been formally	Iraq	Dec 2021	A

			potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.				provided by the State			
3	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G795 not implemented	May 2008	RAF-BSR segment not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq- Saudi Arabia	Dec 2021	B
4	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route A424 not implemented	May 2008	LOTAN-LOVEK segment not implemented	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec 2021	B

Deficiencies in the ATM field

JORDAN

Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**

1	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency agreements not signed with Syria.	H	Corrective Action Plan has not been formally provided by the State. State comment: due to political impact in the region Jordan is not able to complete the signature of contingency agreements with all adjacent States	Jordan	Dec 2021	A

Deficiencies in the ATM field

LEBANON

Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related	Nov 2006	Contingency agreements not signed with Syria	S	Corrective Action Plan has not been formally provided by the State	Lebanon	Dec 2021	A

			supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.							

Deficiencies in the ATM field

LIBYA

Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para 3.3.5.1	-	Not reporting the required data to the MIDRMA in a timely manner.	Dec 2013	-	H O	Corrective Action Plan has not been formally provided by the State	Libya	Dec 2021	A
2	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should	Dec 2014	Agreement signed only with Egypt	S O	Corrective Action Plan has not been formally provided by the State	Libya	Dec 2021	A

			also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs							
Deficiencies in the ATM field **QATAR**										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency agreements not signed with UAE.	S	Corrective Action Plan has not been formally provided by the State	Qatar-Bahrain	Dec 2021	A

Deficiencies in the ATM field SAUDI ARABIA											
Item No	**Identification**		**Deficiencies**				**Corrective Action**				
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency Agreements not signed with Iraq, Qatar and Sudan.	S	Corrective Action Plan has not been formally provided by the State	Saudi Arabia	Dec 2021	A

Deficiencies in the ATM field SUDAN											
Item No	**Identification**		**Deficiencies**				**Corrective Action**				
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Dec 2014	Contingency Agreement signed only with Egypt	H S O	Corrective Action Plan has not been formally provided by the State	Sudan	Dec 2021	A

Deficiencies in the ATM field SYRIA											
Item No	**Identification**		**Deficiencies**				**Corrective Action**				
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G202 not implemented	Dec 1997	Segment DAKWE - Damascus not implemented	S	Corrective Action Plan has not been formally provided by the State	Syria	Dec 2021	B
2	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route UL602 not implemented	Dec 2003	Segments ELEXI-DRZ-GAZ not implemented.	S	Corrective Action Plan has not been formally provided by the State	Syria	Dec 2021	B
3	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies.	Nov 2006	No signed agreement yet	H O	Corrective Action Plan has not been formally provided by the State	Syria	Dec 2021	A

			Contingency agreements should be signed with all adjacent ACCs.							
4	Annex 11 Para 3.3.5.1	-	Reporting unsatisfactory LHDs to MIDRMA	Oct 2013	Syria to coordinate with MIDRMA.	H	Corrective Action Plan has not been formally provided by the State	Syria	Dec 2021	A

Deficiencies in the ATM field

UAE

Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completetion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should	Nov 2006	Plan completed and Agreements signed with Bahrain, Iran, Oman and Saudi Arabia. The plan next is to sign with Qatar after the finalisation of the LoA.	O	Corrective Action Plan has not been formally provided by the State	UAE	Dec 2021	A

			be signed with all adjacent ACCs.							
2	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS routes A418/UP574 not implemented	Dec 2006	KUMUN-PAPAR segment not implemented.	S	Corrective Action Plan has not been formally provided by the State	Iran- UAE	Dec 2021	B

Deficiencies in the SAR field IRAQ											
Item No	**Identification**		**Deficiencies**				**Corrective Action**				
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec 2021	A
2	Annex 6 Part I, Chap.6 and Part II Chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	ELT	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec 2021	A

Deficiencies in the SAR field **KUWAIT**

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	ELT	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Kuwait	Dec 2021	A

Deficiencies in the SAR field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr 2012	-	O	Corrective Action Plan has not been	Lebanon	Dec 2021	A

							formally provided by the State			

Deficiencies in the SAR field

LIBYA

Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Dec 2014	-	H S O	Corrective Action Plan has not been formally provided by the State	Libya	Dec 2021	A
2	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Dec 2014	-	H S O	Corrective Action Plan has not been formally provided by the State	Libya	Dec 2021	A

Deficiencies in the SAR field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec 2021	A
2	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec 2021	A

Deficiencies in the SAR field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec 2021	A
2	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec 2021	A

AIR TRAFFIC MANAGEMENT SUB-GROUP (ATM SG)

1. TERMS OF REFERENCE

1.1 **The Terms of Reference of the ATM Sub-Group are:**

a) ensure that the planning and implementation of ATM in the MID Region is coherent and compatible with developments in adjacent regions, and is in line with the Global Air Navigation Plan (GANP), the Aviation System Block Upgrades (ASBU) framework and the MID Region Air Navigation Strategy;

b) monitor the status of implementation of the MID Region ATM-related ASBU threads/elements included in the MID Region Air Navigation Strategy as well as other required ATM facilities and services; identify the associated difficulties and deficiencies and provide progress reports, as required;

c) keep under review the MID Region ATM performance objectives/priorities, develop action plans to achieve the agreed performance targets and propose changes to the MID Region ATM plans/priorities;

d) seek to achieve common understanding and support from all stakeholders involved in or affected by the ATM developments/activities in the MID Region;

e) provide a platform for harmonization of developments and deployments in the ATM domain;

f) based on the airspace user needs and in coordination with stakeholders (States, International Organizations, user representative organizations and other ICAO Regions), identify requirements and improvements for achieving and maintaining an efficient route network in the MID Region;

g) foster and initiate actions aimed at improving civil/military cooperation and Flexible Use of Airspace (FUA) implementation;

h) keep under review the adequacy of requirements in Search and Rescue field, taking into account, *inter alia*, changes to aircraft operations and new operational requirements or technological developments;

i) ensure the effectiveness of the SSR code allocation system in the MID Region;

j) identify, State by State, those specific deficiencies that constitute major obstacles to the provision of efficient air traffic management and recommend specific measures to eliminate them;

k) develop the MID Region ATM Contingency Plan and ensure that its maintained up to date;

l) monitor the implementation of the MID Region ASBU Modules included in the MID Region Air Navigation Strategy related to the ATM, provide expert inputs for ATM related issues; and propose solutions for meeting ATM operational requirements;

m) monitor and review the latest developments in the area of ATM;

n) Coordinate with relevant MIDANPIRG and RASG-MID Subsidiary bodies issues with common interests;

o) provide regular progress reports to the MIDANPIRG concerning its work programme; and

p) review periodically its Terms of Reference and propose amendments as necessary.

1.2 **In order to meet the Terms of Reference, the ATM Sub-Group shall**:

a) provide necessary assistance and guidance to States to ensure harmonization and interoperability in line with the GANP, the MID ANP and ASBU framework;

b) provide necessary inputs to the MID Region Air Navigation Strategy through the monitoring of the agreed Key Performance Indicators related to ATM;

c) review the MID ATS Routes Network in order to assess its capacity and constraints;

d) identify requirements and improvements for achieving and maintaining an efficient ATS route network in the MID Region;

e) propose a strategy and prioritized plan for development of improvements to the route network, highlighting:

- areas that require immediate attention
- interface issues with adjacent ICAO Regions

f) develop a working depository for route proposals that will be used as a dynamic reference document for ongoing discussions on routes under development/ modification. In this respect, the Task Force should explore the utility that can be realized from the route catalogue concept/ATS routes database;

g) engage the necessary parties regarding routes under consideration, especially the Military Authorities;

h) promote civil/military cooperation and the implementation of the concepts of Flexible Use of Airspace (FUA), free flight, flexible tracks;

i) facilitate effective civil/military cooperation and joint use of airspace in the MID Region;

j) in coordination with the MIDRMA, carry out safety assessment of the proposed changes to the ATS Routes Network;

k) submit completed route proposals for amendment of the Basic ANP Table ATS-1, to the ICAO MID Regional Office for processing;

l) monitor the RVSM operations and support the continued safe use of RVSM in the MID Region;

m) review and maintain the MID Region SSR Code Allocation Plan and monitor the implementation of the SSR codes allocation procedures in the Region;

n) assist States in the development and co-ordination of contingency plans and ensure that the Regional contingency plan is maintained up-to-date;

o) assess the effectiveness of the agreed Contingency measures/procedures and propose mitigation measures, as appropriate;

p) address ATM and SAR interface issues with other regions and make specific recommendations to achieve seamlessness and harmonization;

q) review the requirements and monitor the status of implementation of ATM and SAR services;

r) analyse, review and monitor deficiencies in the ATM and SAR fields;

s) develop proposals for the updating of relevant ICAO documentation, including the amendment of relevant parts of the MID ANP, as deemed necessary;

t) establish and monitor ATM performance objectives for the MID Region; and

u) taking into account human factors studies and available guidance material, make operational recommendations related to ATM personnel in the changing technological environment.

2. COMPOSITION

2.1 The Sub-Group is composed of:

a) MIDANPIRG Member States;

b) experts nominated by Middle East Provider States from both Civil Aviation Authority and Military Authority;

c) concerned International and Regional Organizations as observers; and

d) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

3. WORKING ARRANGEMENTS

3.1 The Chairperson, in close co-operation with the Secretary, shall make all necessary arrangements for the most efficient working of the Sub-Group. The Sub-Group shall at all times conduct its activities in the most efficient manner possible with a minimum of formality and paperwork (paperless meetings). Permanent contact shall be maintained between the Chairperson, Secretary and Members of the Sub-Group to advance the work. Best advantage should be taken of modern communications facilities, particularly video-conferencing (Virtual Meetings) and e-mails.

3.2 Face-to-face meetings will be conducted when it is necessary to do so.

**TERMS OF REFERENCE (TOR) OF THE
MIDANPIRG AIR TRAFFIC FLOW MANAGEMENT TASK FORCE
(ATFM TF)**

I. TERMS OF REFERENCE

1.1 Perform a joint assessment and confirmation of the Pre-requisites for a regional ATFM solution~~.~~, This shall include:

a) Assessment of the performance objectives of the individual participating States and definition of common performance objectives for a regional ATFM service.

b) Perform a data collection and analysis to identify hot-spot areas and critical times in a regional ATFM service area where demand consistently exceeds capacity. The reasons and contributing factors for unbalanced demand and capacity are to be identified.

c) Analysis of air traffic flows within the designated area of the regional ATFM service that is causing unbalanced demand and capacity. The analysis shall identify the traffic fractions that due to their uniformity are candidates for effective ATFM measures to increase the efficiency without violating the equity principle.

1.2 Develop an ATFM Concept of Operations and a Framework which addresses ATFM minimum requirements for the implementation of ATFM in the ICAO MID Region.

1.3 Agree on a mechanism to support the phased implementation of ATFM measures in the MID Region, when and where required.

1.4 Identify, research and recommend appropriate guidance regarding:

a) ~~aerodromes~~ Aerodromes and ~~enroute capacities~~ Airspace capacity under the normal circumstances and adjustment factors affecting the capacity;

b) regular review for all aerodromes and ATC sectors where traffic demand is expected to reach capacity, or is resulting in traffic congestion;

c) regular review of the implemented ATFM measures and the related publications; to support implementation of the required mesures and reflection by the data houses (such as: Flight Planning Systems) and compliance of the airspace users;

d) mechanisms for ATFM data gathering, and exchanging operational data related to airspaces/aerdromes availablility and air operation data between States, ANSPs, Airspace users, Organizations and ICAO, which may include:

i. adjusted aerodromes and enroute capacity due to factors affecting capacity such as:

- Amid and after crisis management measures (mainly related to ANS Business Continouty Plans and recovery);
- special use airspace status, runway closures; or
- weather phenominas.

ii. traffic demand information which may include flight schedules, flight plan data, repetitive flight plan data as well as associated surveillance updates of flight status; and

iii. ATFM Daily Plan.

e) measure compliance of airspace users with the applicable ATFM measures; and

f) any other guidance relevant to the Regional ATFM Framework.

1.5 Consider existing and planned ATFM initiative in the Region, and make specific recommendations to ensure their alignment.

1.6 Ensure inter-regional ATFM harmonization with adjacent ICAO Regions.

1.7 Recommend appropriate inputs related to the implementations of ASBU ~~Modules~~ Elements / Threads relevant to ATFM such as NOPS, A-CDM, etc.

1.8 Report to the ATM SG.

1.9 Review periodically its Terms of Reference and propose amendments as necessary.

~~1.10~~ Coordinate as deemed necessary with the ~~Aerodromes Sefety, Planning and Implementation Group (ASPIG) and the Meteorology Sub-Group (MET SG) the issues of mutual interest~~ relevant MIDANPIRG Sub-Groups and the Regional initiatives, metters of mutual interest.

II. COMPOSITION

2.1 The Task Force is composed of MID ATFM focal points and experts from:

a) MIDANPIRG Member States;

b) India, FAA, AACO, ACAO, AEROTHAI, CANSO, EUROCONTROL, IATA, and ICAO (Bangkok, Cairo, Paris Offices and HQ); and

c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

2.2 The Task Force shall elect a Chairperson to act as the point of contact on behalf the Task Force.

2.3 ICAO MID Office will act as the Secretary of the ATFM Task Force meetings.

III. WORKING ARRANGMENTS

3.1 The Chairperson, in close co-operation with the Secretary, shall make all necessary arrangements for the most efficient working of the Task Force. The Task Force shall at all times conduct its activities in the most efficient manner possible with a minimum of formality and paper work (paperless meetings). Permanent contact shall be maintained between the Chairpeson, Secretary and Members of the Task Force to advance the work. Best advantage should be taken of modern communications facilities, particularly video-conferencing (Virtual Meetings) and e-mails.

3.2 Face-to-face meetings will be conducted when it is necessary to do so.

TERMS OF REFERENCE (TOR) OF THE MIDANPIRG FIFA WORLD CUP 2022 TASK FORCE (FWC2022 TF)

1. OBJECTIVES AND SCOPE

1.1 The Task Force will be expected to apply the performance-based approach through a collaborative manner to address the most strategic decisions to reach the following:

a) A sufficient coordination between the Air Navigation Service Providers (ANSPs), airports, airspace users and regulators;

b) A sufficient coordination at local, regional and inter-regional levels to accommodate safely and efficiently the expected significant increase of traffic; and

c) A defragmented approach from an operational perspective to achieve (gate-to-gate, city pairs, and an oriented track system) which leads to more than optimum flight and airport operations efficiency.

1.2 The Task Force shall support the MID Region ATFM System once established.

2. TERMS OF REFERENCE OF THE TASKFORCE

2.1 Develop and follow-up the implementation of ~~an~~ FWC2022 ~~action~~ Action ~~plan~~ Plan to accommodate the expected high increase of traffic, in a safe and efficient manner, taking into consideration similar experiences from other regions.

2.2 Address other major events ~~such as the EXPO 2020~~ and develop action plan(s) to accommodate the changes in traffic flows as required.

2.3 Define explicit and implicit strategic objectives (e.g. improved safety, increased air traffic capacity, improved efficiency, and mitigation of airspace congestion impact).

2.4 Identify operational and technical requirements including proposals for airspace management changes and amendment to the MID ATS Route Network to accommodate the air traffic through the establishment of temporary routes as required.

2.5 Develop the concept of collaborative decision-making at the strategic, tactical and pre- tactical levels, which would be implemented before and during the World Cup event.

2.6 Suggest methods for increased interaction between airspace providers in order to make sure that the network effects of any trajectory selection are properly incorporated in the decisions.

2.7 Develop collaborative regional mechanism for the implementation of ATFM solutions/measures such as Ground Delay Program (GDP), which would be implemented for departures from airports in the region.

2.8 Assess the operational performance of the ATM network by its capability to accommodate demand through realistically modeled network nodes, i.e. airports and airspace volumes.

2.9 The Task Force shall work in close coordination with the ATFM TF to avoid duplication of efforts.

3. COMPOSITION

3.1 The World Cup 2022 Task Force is composed of experts from:

a) MIDANPIRG Member States;

b) India, FAA, AACO, ACAO, AEROTHAI, CANSO, EUROCONTROL and IATA; and

c) other representatives from States, Organizations and Industry may be invited on ad-hoc basis, when required.

3.2 ICAO MID Office will act as the Secretary of the Task Force.

4. WORKING PROCEDURES

4.1 Qatar shall act as the Chairman of the Task Force.

4.2 In order to effectively perform its tasks and responsibilities, the Task Force will meet as required in order to achieve its objectives.

~~4.3 Coordination will be carried out among the Task Force members and with concerned State(s) through correspondence and teleconferences and, if required, face-to-face meetings with stakeholders on case-by-case basis.~~

~~4.4~~4.3 A Core Team might be established to follow-up with the concerned State(s) and air operators the conduct of safety and operational assessments and provide support as appropriate.

4.4 The Chairperson, in close co-operation with the Secretary, shall make all necessary arrangements for the most efficient working of the Task Force. The Task Force shall at all times conduct its activities in the most efficient manner possible with a minimum of formality and paper work (paperless meetings). Permanent contact shall be maintained between the Chairpeson, Secretary and Members of the Task Force to advance the work. Best advantage should be taken of modern communications facilities, particularly video-conferencing (Virtual Meetings) and e-mails.

4.5 Face-to-face meetings will be conducted when it is necessary to do so.

ATTACHMENT A

LIST OF PARTICIPANTS

State	Name	Title
BAHRAIN	Mr. Abdulla Hasan Al Qadhi	Chief AIM
	Mr. Ahmed Ebrahim Ali	Head Shift
	Mr. Ahmed Mohammed Bucheeri	Chief Air Traffic Management
	Mr. Ahmed Mohammed Al Shamlan	Head Search & Rescue
	Mr. Ahmed Yousif Al Malki	Head Shift
	Mr. Isa Mohammed Khameeri	Head Safety Management & Quality Group
EGYPT	Mr. Abdallah Ebrahiem Hussien Siam	ATC Controller - ECAA
	Mr. Abdelrahman Zaki	ATCO – R&D specialist – NANSC
	Mr. Ahmed Nasr Zakareiya Shady	Safety Officer - NANSC
	Mr. Amr Ibrahim Abdel Latif	ANS Inspector - ECAA
	Mr. Ehab Raslan Mohamed	G.M of R&D – NANSC
	Mr. Haitham Mohamed Bakr Mahmoud	Sat. Eng. – NANSC
	Mr. Mohamed Hassan Saad Mohamed	Safety Officer - NANSC
	Mr. Mostafa Asem	ATCO – R&D specialist – NANSC
	Ms. Rana Mohammad Abd El-Raheem Mohammad	ANS Inspector - ECAA
	Nav. Tayseer Mohamed Abdel Kareem	Head of Central Administration for Air Navigation - ECAA

State	Name	Title
IRAN	Mr. Amirhosein Sadeghcheh	Director General of ATM - Iran Airports and Air Navigation Company
	Mr. Behzad Soheil	Deputy Director General of ATM - Iran Airports and Air Navigation Company
	Mr. Masoud Nikbakht	Deputy Director General of ATM - Iran Airports and Air Navigation Company
	Mr. Meisam Shaker	Director Aerodromes and ANS Safety Oversight - Civil Aviation Organization of I.R Iran
	Mr. Saber Safaei Tanha	ANS Auditor - CAO IRI
	Mr. Shahram Najafi	ANS Auditor - CAO IRI
	Ms. Sotoudeh Nikmanesh	ATC Expert - CAO IRI
IRAQ	Mr. Allayth M. Alwan	ATS OPS Manager – GCANS
	Ms. Fatimah Hasan Mohammed	ATM Inspector
	Mr. Husam Sabah Abdulzahra	
	Mr. Jasim Abed Ali	ATS Director - GCANS
JORDAN	Mr. Ahmad Mahmoud Odeh	OJT Supervisor
	Mr. Ahmad Saleh Al Hiyari	Director Air Navigation Services
	Mr. Ali Taleb Emrazeeq	Chief TACC
	Mr. Khaled Ahmed Arabiyat	ATM Director
	Mr. Marwan Hani Ibrahim AlMasri	Air Traffic Controller
	Mr. Mohammad Ali Al-momani	Chief of Safety & Stander ATM

State	Name	Title
	Mr. Mohammed Douqa	ANS Inspector
	Mr. Mohammad Salamah	Director of Air Navigation Services
	Mrs. Narman Izzat As'ad	Chief of ATM Training Division
	Mr. Tamer Ahmad Hassan Al-Nabulsi	ATM Specialist / ATM Division
KUWAIT	Mr. Ahmad Moh. Butaiban	Head of ACC and App Division
	Mr. Faisal Adel Alasousi	Superintendent of AIS
	Mr. Meshal Salem Alqenaei	Head of Airport Control Tower and Ground Division
	Mr. Mustafa A. Altarrah	Head of Air Navigation Services
	Mr. Naser Shatan Ashkanani	First Radar Officer
	Mr. Tareq Faisal Alghareeb	Head of Tower & ATC OPS
LEBANON	Mr. Tarek Mrad	Head Section Beirut ACC & APP Control Center
LIBYA	Mr. Abdulmonaam Abaza	ANS Director
	Mr. Basam Gholam	Tripoli TWR Unit
	Mr. Fateh Arabi	ACC Supervisor
	Mr. Osama Elahwel	Head of ATC
OMAN	Mr. Abdullah Said Al-Hasani	Standard Officer- ATFM
	Mr. Nasser Salim Al-Mazroui	Act. Director Air Traffic Control Services
	Mr. Sulaiman Nasser Al-Salmi	Act. Chief of Airspace

State	Name	Title
QATAR	Mr. Ahmed Al-Eshaq	Director Air Navigation
	Mr. Ali Mohd S H Al-Hail	Electronic Eng.
	Mr. Dhiraj Ramdoyal	Head ANS Inspectorate
	Mr. Erwin Obergruber	ANS Advisor
	Ms. Hessa Yousuf Al-Meadadi	ATCO
	Mr. Ibrahim Kozanli	Electronic Eng.
	Mr. Kevin John Cooper	ANS Advisor
	Mr. Mohammed Al Muhamadi	Head Integrated Training
	Mrs. Pamela Erice	Acting Head AIM
	Mr. Pieter Jacobus De Bruyn	ATC Instructor
	Dr. Ramy Saad	ANS Inspector
	Mr. Stuart Ratcliffe	ATFM/A-CDM Work Group
	Mr. Yousuf Saleh Al-Mohannadi	ATCO
SAUDI ARABIA	Mr. Abdullah Moaham. Albathi	GACA-ASD -GM
	Mr. Ahmad Sami Mohammad Abu-Ghallab	ATFM -Manager
	Mr. Bassam A. Alghamdi	ANS Inspector
	Mr Fahad S O Al-Harbi	SAR Manager
	Mr. Faris Alzahrani	Air Navigation Safety Inspector
	Mr. Hamdan M. Alshaibani	ANS Inspector
	Mr. Jamal A. Alanazi	ANS Inspector

State	Name	Title
	Mr. Marzouk Alshrah	ICAO ATS Expert
	Mr. Mohammed Omar Alalawi	Aviation Standards/Airspace Standards
	Mr. Mohammad Taisser Khawaj	ATS Safety Expert
	Mr. Ridah Salah. Dridi	Safety Advisor
	Mr. Terad A Alghamdi	Analysis and planning Sup.
	Mr. Waleed Y. Alsulaim	ANS Inspector
SUDAN	Mr. Arafat Abdelrahman	AIM Inspector-Air Navigation Regulatory Directorate
	Mr. Bakri Hussein Merghani	Senior Air Traffic Controller
	Mr. Mohamed Eltayeb Ahmed	Director Air Navigation Regulatory Directorate
	Mr. Mohamed Zeinelabdin Osman Abdalla	Senior Air Traffic Controller and ATM System
	Mr. Mohammed Abdulrahman Ahmed	ATM/SAR Inspector/ANR Directorate
	Mr. Yasir Rabih Hassan	Director of Air Traffic Management
SYRIA	Mrs. Ghadeer Hossieno	Head of Aeronautical Information Services Section
	Mr. Hassan Hamoud	Air Traffic Management Director
	Mr. Muhammad Salamah	Deputy Air Traffic Management Director
	Mrs. Nada Mahfoud	ANS Inspector
	Mr. Tarek Al Jourf	Air Navigation Department
UAE	Mr. Ahmed Saleh Al Shehhi	Senior Specialist – Airspace Management
	Mr. Ahmed Yousif Mohamed Yousif Al Obeidli	Senior Manager Air Navigation Section – GCAA

State	Name	Title
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	Mr. Hamad Rashid Al Belushi	Senior Expert Air Traffic Management
	Mr. Muayyed Abdulla Alteneiji	Director Air Traffic Management
	Mr. Nasser AL Kharusi	Senior Specialist-Airspace Management
	Mr. Omar Obaid Al Abdouli	Manager ATC
	Mr. Saqr Obaid Al Marashda	Senior Manager – Airspace Management
YEMEN	Mr. Abdullah Abdulwareth Al-Eryani	General Director Air Navigation – ANS Sector (CAMA)
	Mr. Abdullah Ahmed Alhudaifi	SMS / QMS Expert
	Mr. Ahmed Mohamed Alkobati	Advisor at ANS Sector
	Mr. Abdullah Mohammed Othman	Manager of ACC
	Mr. Awsan Anwar Ahmed Taher	Director of ATM/Aden Intl Airport
	Mr. Hussein Hussein Al-Abed	Manager of ANS Operations
	Mr. Ibrahim Mohammed Jaber	Director of ANS Statistics
	Mr. Mahmood M. Abdul Razak	Consultant-ATS
	Mr. Mazen Saeed Farag Saeed	ANS Focal Point
	Mr. Younis Al-Khader	Director General of Air Navigation (CAMA – Aden)

Org.	Name	Title
AACO	Mr. Mohamad Akel	Specialist – Economics and Technical Departments
ACAO	Eng. Hicham Bennani	Safety and Air Navigation Expert
EUROCONTROL	Mr. Keith Crawford	Senior ATFCM Expert
	Mr. Tihomir Todorov	Head of Section Airspace Design
IATA	Mr. Jehad Faqir	Assistant Director Safety & Flight Operations - Middle East & North Africa
	Ms. Zainab Khudhair	Manager Safety and Flight Operations for Africa and the Middle East
MIDRMA	Mr. Fareed AL Alawi	MIDRMA Manager
	Mr. Fathi Al-thawadi	MIDRMA Officer
	Mr. Amal Jo Antony	Data Analyst
ICAO EASF	Mrs. Keziah A. Ogutu	Regional Officer, ATM/SAR
ICAO MID	Mr. Mohamed Smaoui	Acting Regional Director (ARD)
	Mrs. Muna Alnadaf	Regional Officer, Communications, Navigation and Surveillance (RO/CNS)
	Mr. Radhouan Aissaoui	Regional Officer, Information Management (RO/IM)
	Mr. Ahmad Amireh	Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR)
	Mr. Ahmad Kavehfirouz	Regional Officer, Air Traffic Management (RO/ATM)
	Ms. Dina El Karimy	Technical Assistant (ATM/SAR & ASF)
	Mr. Mohamed Hamed	Marketing Assistant
	Mr. Ayman Ramadan	ICT Assistant

- END -