International Civil Aviation Organization

SUMMARY OF DISCUSSION

ICAO MID IWXXM Implementation Webinar

(26-27 May 2021, 08:00 – 12:00 UTC)

1. INTRODUCTION

1.1 The ICAO MID IWXXM Implementation Webinar was successfully held on 26 – 27 May 2021, from 08:00 to 12:00 UTC using MS Teams facility.

1.2 The objectives of the Webinar are to share information on the background, requirements and best implementation practices of ICAO Provisions and World Meteorological Organization (WMO) means of compliance related to the ICAO Meteorological Information Exchange Model (IWXXM).

1.3 The Webinar was attended by a total of one-hundred and four (104) participants from seventeen (17) States (Austria, Bahrain, Belgium, France, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE and USA) and three (3) Organizations/Industries (GCC, IFATCA and WMO). The list of participants is at **Attachment A**.

1.4 The Webinar's materials including, Agenda/Work Programme, presentations and the Summary of Discussion are available at https://www.icao.int/MID/Pages/2021/IWXXM%20Impl.%20Webina.aspx.

2. OPENING REMARKS

2.1 Mr. Christopher Keohan, Regional Officer Meteorology, Europe and North Atlantic Regional Office, welcomed all participants and noted that provisions related to IWXXM became a requirement in Amendment 78 to Annex 3 applicable 5 November 2020. Specifically, the following MET related data shall be disseminated in IWXXM form in addition to Traditional Alphanumeric Code (TAC) form: METAR and SPECI, TAF, SIGMET and AIRMET, Tropical Cyclone Advisory, Volcanic Ash Advisory and Space Weather Advisory Information.

2.2 Mr. Keohan also explained the advantages of providing MET data in IWXXM format in that TAC data is not geo-referenced specifically to aeronautical information which is needed to move towards a System Wide Information Management (SWIM) environment. In addition, national extensions are easier to support in IWXXM and additional information nationally (e.g. reporting wind at various altitudes on approach) can be provided in a standard format.

2.3 Mr. Keohan also noted that only 3 of the 15 States in the MID Region have implemented IWXXM to date and therefore the MID MET SG/9 meeting (7 to 9 December 2020) requested a Webinar to assist States in IWXXM implementation. He thanked the presenters and organizers for taking their time out of their busy schedules to assist the MID Region in this regard and wished all participants a successful Webinar,

3. DISCUSSIONS

3.1 *Background*

SWIM & ICAO ASBU

3.1.1 This session was provided in PPT01 presented by the EUR Data Management Group (DMG) Vice Chair from Belgium.

3.1.2 This presentation described that SWIM consists of standards, infrastructure and governance enabling the management of ATM related information and its exchange between qualified partners via interoperable services. The Webinar noted that within the scope of SWIM there are information exchange services, information exchange models, SWIM infrastructure and a governance layer. Network connectivity and SWIM enabled applications implemented by SWIM users are not considered to be part of the scope of SWIM. IWXXM is one of the information exchange models and a prerequisite for SWIM that lies in the information part of the SWIM scope. The Webinar noted that IWXXM OPMET data distribution is in a new message format, gml, and distributed in a new communication technology, compressed AMHS File Transfer Body Part. The message distribution through the Regional OPMET Data Exchange (RODEX) scheme is 'old school', however a necessary first step towards SWIM.

3.1.3 The current OPMET distribution around the globe and within the EUR Region was provided to the Webinar. The question of how to adapt distribution of data in the SWIM environment was posed and still unknown.

3.1.4 The ICAO structure on SWIM provisions (global level) and implementation (regional level) was also provided. Lastly, the Webinar noted that the new timeline that SWIM has been moved from Block 1 (2019) to Block 2 (2025) in the ICAO Global Air Navigation Plan (GANP) 2019.

METP WG-MIE

3.1.5 This session was provided in PPT02 presented by the EUR DMG Chair from France. The structure of the MET Panel (METP) Working Group on Meteorological Information Exchange (WG-MIE) was provided and consists of 4 work streams: IWXXM Requirements, SWIM Plan, IWXXM Documentation and Support and Coordination.

3.1.6 Developments of the WG-MIE (subject to MET Panel agreement) were provided to the Webinar and include: proposal for a new IWXXM versioning policy; proposal for ICAO to arrange for an IWXXM State extension repository and develop related guidelines and promotion process for extensions to become part of the main schema; developing a new IWXXM design that would treat an instance of a meteorological phenomenon as a weather object; mitigating restraints posed on IWXXM due to TAC templates; defining a new IWXXM design that can better support features in the SWIM environment; proposing updates to IWXXM to be compliant with the ATM Information Reference Model (AIRM); proposing that TAC be removed as a standard in ICAO Annex 3 within the Block 2 timeframe (2025-2030); and propose to METP that WG-MIE should coordinate implementation of interregional IWXXM information exchange including implementing METNO procedure globally and develop a work package to test the full AMHS File Transfer Body Part (FTBP) connectivity between adjacent regions.

WMO developments related to IWXXM

3.1.7 This session was provided in PPT03 presented by a member of the WMO Task Team on Aviation Data (TT-AvData).

3.1.8 This presentation described the WMO approval process in releasing an update to the IWXXM schema. The fast track amendment procedure is used for amendments that have minor financial or operational implications (e.g. minor version or patch release). This approval process usually takes six months from the completion of the draft amendment to implementation of the decision. The in-session / between technical commission sessions amendment procedure is used for amendments that have a noticeable financial or operational implications (e.g. major version release). This approval process usually takes eight months or more to complete.

3.1.9 This presentation also contains many links related to IWXXM; description of the version numbering; new versioning scheme expected to be operational by November 2021; compatibility with new versions (compatible for a patch change to a product – n.n.**n** -; not compatible for major and/or minor change to a product - **n**.**n**.n -); validation description for schema (document blueprint) and schematron (script); collectives and aggregation; extensions; use of Aeronautical Information Exchange Model (AIXM) in IWXXM; georeferencing; links to the AIRM that describes the ATM system-wide reference vocabulary for defining ATM information noting that work is in progress to refresh the mappings of AIRM to IWXXM version 3.0; and limitations of IWXXM induced by TAC counterparts were described.

Guidelines for the Implementation of OPMET Data Exchange using IWXXM

3.1.10 The session was provided in PPT04 presented by a member of the EUR DMG from Austro Control.

3.1.11 Guidelines for the Implementation of OPMET Data Exchange using IWXXM has been developed and delivered by the METP to the PIRGs for consideration as guidance in the respective ICAO Regions. This document in the Middle East is EUR Doc 012 as approved by MIDANPIRG and located on the ICAO MID website.

3.1.12 The Webinar reviewed the history of the document; current and new functionalities and capabilities for the originating unit, National OPMET Centre (NOC), Regional OPMET Centre (ROC), Inter-regional OPMET Gateway (IROG) and Regional OPMET Data Bank (RODB). Technical aspects of IWXXM such as file naming, bulletin headers, operating principles, translation details, data collection, transmission and routing, compliance testing and aeronautical information metadata were reviewed.

Harmonization of METNO procedure

3.1.13 This session was provided in PPT05 presented by the EUR DMG Chair from France.

3.1.14 This presentation described the main goal of harmonizing the METNO procedure is to improve interregional and regional coordination on the notification of changes for OPMET data. The Webinar noted that the WG-MIE plans to propose to all ICAO regions (eventually through the METP) a harmonized METNO procedure to assure a global and an efficient mechanism of notification. The first phase of harmonization between the EUR and APAC Regions has been achieved.

3.1.15 The general principles of harmonizing the METNO procedure were described as well as the function of the focal point (which maybe a regional group) managing regional updates to OPMET data distribution.

Interregional IWXXM coordination

3.1.16 This session was provided in PPT06 presented by the EUR DMG Chair from France.

3.1.17 This presentation describes that interregional IWXXM data exchange requires a full AMHS path with FTBP and that the file naming comply with regional guidance available (e.g. MID Doc 012). The traffic / bandwidth should also be monitored as IWXXM is implemented in more States. The notification of IWXXM exchange should be done through the METNO procedure. Steps on interregional IWXXM data exchange were provided to the Webinar.

Steps on IWXXM implementation

3.1.18 This session was provided in PPT07 presented by the EUR DMG Vice Chair from Belgium.

3.1.19 This presentation described the suggested steps on IWXXM implementation that included tasks to be conducted by the aeronautical MET Provider, NOC (MET Switch), National AFS COM Centre, ROC/IROG and RODBs. Testing and validation and OPMET data registration as well as interoperability (AMHS, IWXXM and RODB) were also described.

Example of IWXXM implementation in Belgium

3.1.20 This session was provided in PPT08 presented by the EUR DMG Vice Chair from Belgium.

3.1.21 This presentation describes IWXXM implementation in Belgium and provided issues identified and actions taken to mitigate those issues. Specifically, validation was performed in steps in order to reduce the risk of validation. These steps included 4 levels: level 1 – well-formed XML document; level 2 – level 1 plus stations known; level 3 – level 2 plus XSD schema validation; and level 4 – level 3 plus schematron validation. Furthermore, in order to prevent test messages and untrusted messages from being routed, conditional messaging was used to route/process based on attributes such as permissible usage, translation centre etc. In addition, to address TAC to IWXXM translation difficulties for non-polygon areas, it was decided not to limit the number of polygon coordinates to 7. Other issues were also addressed such as different versions of a report received; database catalogue; RODB reply messages for compiling collections of reports of different sources or different IWXXM versions; and non-delivery report handling for user without extended AMHS capabilities.

3.1.22 In the future, Belgium plans to generate IWXXM at source and develop web services in the context of SWIM.

Example of IWXXM implementation in Austria

3.1.23 This session was provided in PPT09 presented by the EUR DMG member from Austria.

3.1.24 This presentation described the history of IWXXM implementation in Austria which included MET-Switch and RODB IWXXM capabilities history as well as experiences related to the test exchange of IWXXM-data with several States. Future plans include: generation of IWXXM at source; providing SWIM functionalities via RODB; and define and implement IWXXM-monitoring.

Overview of Appendix H of the EUR AMHS Manual (EUR Doc 020)

3.1.25 This session was provided in PPT10 presented by the ICAO MID Region (RO-CNS).

3.1.26 This presentation described the advantages of AMHS in contrast to many limitations of AFTN such maximum message length. ICAO Docs for AMHS were referenced with an emphasis on Appendix H of EUR Doc 020. The advantages of using ATS Message Handling Service includes: practically unlimited message length; virtually no limit on the number of addresses of a message; provision of non-delivery reports and indication of the subject of a message.

3.1.27 Extended ATS service levels used for IWXXM includes: 1) FTBP that supports conveyance of binary data and IPM Heading Extensions (IHE). The AMHS profile for IWXXM is incorporated in Appendix H of EUR Doc 020. The profile specification is established for application by AMHS User Agents (UA)s submitting and/or receiving OPMET data in IWXXM format through a P2/P3 or a P2/P7 interface.

3.1.28 Other topics described includes: data compression; ATS priority and indicator; Interpersonal Message (IPM); Interpersonal Notification (IPN); information model; originator/recipient AMHS address; and conformance tests that are divided into three categories.

Status of IWXXM Implementation in the MID States

3.1.29 The Webinar learned of the status of IWXXM Implementation in several of the MID States as provided in the following table:

Table – Status of IWXXM Implementation in the MID Region

State	Expected implementation date	Comment
Bahrain		
Egypt		
Iraq		
Iran		
Jordan	Q3 2021	Upgraded MET-Switch; connection to COM expected shortly followed by conformance test
Kuwait	End 2021/ early 2022	
Lebanon	End 2023	
Libya		
Oman	End 2021/ early 2022	
Qatar	Mid 2021	Testing IWXXM v3.0 between MET and COM Centres
Saudi Arabia	Q2 2022	IWXXM v3.0
Sudan		
Syria		
United Arab Emirates	complete	Becoming compliant at national aerodromes
Yemen		

4. WEBINAR CONCLUSIONS AND RECOMMENDATIONS

- **IWXXM advantages** include:
  - use of aeronautical information;
  - use of geographical mapping – IWXXM mandates 2.5D for geospatial representation;
  - enforces correct format noting that TAC has significant format issues for TAF and SIGMET – also note that verification can be made through IWXXM validation performed by the originator;
  - use of IWXXM extensions which allows for flexibility on providing additional meteorological information nationally; and
  - serves as a pre-requisite for SWIM noting there are other pre-requisites for SWIM implementation (e.g. AIXM, FIXM, AIRM).

    Note: for more information reference links provided in PPT03
- **WMO and ICAO related issues** include:
  - WMO and ICAO to synchronize the timeline of the approval of Annex 3 (requirements) by ICAO and the approval of IWXXM (means of compliance) by WMO as well as reduce the frequency of significant changes to the schema;
  - continue mapping to the AIRM;
  - discussions commenced on relaxing TAC restrictions in IWXXM (e.g. reporting a maximum use of 4 Runway Visible Range observations; minimum and maximum Temperature shall be provided in pairs; maximum number of points (7) used in

describing a SIGMET polygon);

- forthcoming IWXXM developments should focus more on operations in the SWIM environment;
- use of TAC in the long term in that TAC could be replaced with rendered text and/or graphics from IWXXM reports; and
- removal of WMO AHL in context of SWIM – note this can currently be done for national use.

- **IWXXM production** should consider:
  - cost of using a vendor which may provide TAC to IWXXM translation on the MET Switch;
  - cost of using vendor if extensions are needed (likely a higher cost than without extensions needed);
  - IWXXM production provided at source;
  - cost of development in-house;
  - coordination between MET and COM needed (e.g. for testing and adding/updating AMHS addresses for external distribution); and
  - implement IWXXM Schema version 3.0 (https://schemas.wmo.int/iwxxm/3.0/html) which meets Amendment 78 to Annex 3 requirements – *note that the next update is expected to be available at the end of 2021 which will meet Amendment 79 and Amendment 80 to Annex 3 requirements*.
- **IWXXM extensions** allow for flexibility on providing additional meteorological information nationally;
  - though METAR and TAF have a remarks section to provide for national use the use of this is discouraged by ICAO for global exchange and there is no common format – also note that WMO 306, Vol I.1 states for the RMK in a METAR: *The indicator RMK denotes the beginning of a section containing information included by national decision which shall not be disseminated internationally*;
  - IWXXM extensions on the other hand have a structured format on providing extra meteorological information that meets national operational needs and for this reason serves as a motivator to implement IWXXM;
  - IWXXM extensions can be used now and aviation stakeholders should be informed of the availability of this information; and
  - a proposal for ICAO to consider setting up a common repository of State extensions defined is being made.

    Note – examples of extensions from the U.S. is provided at the following link: https://nws.weather.gov/schemas/iwxxm-us/3.0/uml/index.html.
- **Regional IWXXM exchange**
  - exchange IWXXM within the Region in accordance to the Regional OPMET Data Exchange scheme – in MID, send to ROC Jeddah and back-up ROC Bahrain;
  - it is important to monitor the available bandwidth of the AMHS-links as it is expected that the number of IWXXM-data will increase;
  - inform of exchange changes (e.g. content of bulletins) via METNO on an AIRAC Cycle (process and guidance expected to be provided by WG-MIE to the PIRGs by the of 2021);
  - use AFS - IWXXM cannot use AFTN or AMHS with basic services only and therefore uses AMHS with extended service - including FTBP & IHE; and

- o if a destination (UA or AFS Centre) cannot receive IWXXM data, non-delivery report will be reflected in the delivery report received by the sender;
- o most of the States in the MID Region have the ATS extended services capabilities and need to enable it. Furthermore, MID ROC Plan required all Main COM centres to implement ATS extended Services (FTBP).

- **Inter-regional IWXXM exchange**
  - o needs global coordination – to be considered by the METP WG-MIE;
  - o inform of exchange changes (e.g. content of bulletins) via METNO on an AIRAC Cycle (process and guidance expected to be provided by WG-MIE to the PIRGs by the end of 2021); and
  - o ICAO EUR and MID Regions may be able to exchange IWXXM data after inter-regional link between Nicosia and Jeddah is available (Q3 2021).
- IWXXM impact to ATIS and VOLMET
  - o there are no apparent IWXXM impacts to ATIS noting ATIS depends on meteorological information disseminated locally and not internationally as with METAR;
  - o VOLMET contains METAR and depending on a regional air navigation agreement, TAF and SIGMET may be required on VOLMET as well, noting that the elements in these products are contained in IWXXM; and
  - o the means of obtaining data required for flight and other aviation stakeholders is expected to be obtained through SWIM services within this decade.

5. CLOSING

5.1 Mr. Christopher Keohan, Regional Officer Meteorology, Europe and North Atlantic Regional Office, thanked all participants for their active participation and fruitful discussion and valuable outcomes. He indicated that from an ICAO perspective, the objectives of the Webinar were met as the Webinar shared information on the background, requirements and best implementation practices of ICAO Provisions and World Meteorological Organization (WMO) means of compliance related to IWXXM.

5.2 Mr. Keohan expressed his gratefulness to the speakers from Austria, Belgium, France, ICAO MID Regional Office and WMO as well as the support from the ICAO MID Region.

5.3 Lastly, WMO kindly offered to investigate restarting an IWXXM support group (e.g. google group) that would assist States in providing information addressing their implementation concerns.

ICAO MID

ATTACHMENT A

ICAO MID IWXXM Implementation Webinar

(26-27 May 2021, 08:00 – 12:00 UTC)

List of Participants

State Org/Industries	Contact	Title
Austria	Mr. Michael Pichler	Austro Control
Bahrain	Mr. Abdulaziz Ebrahim Albalooshi	MET IT Administrator
Belgium	Mr. Wim Demol	Skeyes
Egypt	Mr. Ahmed Abdalsatar Mohamed Alkholy	Director Of Cairo Airport Forecast Center
	Mr. Yasser Abdelgwad Elsayed	Deputy Director of Cairo Airport Forecast Center
	Mr. Mahmoud Abdrahem Abdou	Meteorologist of Cairo airport forecast center
	Mr. Tayseer Mohamed Abdel Kareem	ATS General Manager
	Mr. Samer Hussein Emam	G.M. Airspace Affairs and AIS
	Mr. Sherif Abdelrazek Aql Badr	Aeronautical Telecommunication Inspector
	Mr. Ahmed Abdelwahab M. El Morady	Senior ANS/ATM Inspector
	Mr. Ahmed Mostafa M. Arman	Senior CNS Inspector
	Mr. Adel Abd-Alhalim Mahmoud	Director of Developing and Design
	Mr. Ahmed Mohammed Zoulfakar	Meteorologist Inspector
	Mrs. Nadia Abdel Fattah Elsebaey	First Specialist in International Affairs Dept
	Mrs. Hala Ismail Abdelhamid Hasanen	Acting Director of Management of International Conferences & Agencies Int'l Affairs Department
	Mr. Ibrahim Mohammed Gaballah	Meteorologist
	Mr. Walid Ibrahim Mohammed	Director of Operation in IT
	Ms. Sahar Abdel Salam	AIS Manager – R&D Specialist
	Mr. Eslam El Sayed Abdel Fatah	AIS Officer
	Mr. Ahmed Abdel Latif Mohamed	AIS Officer
	Mr. Mohamed Soudi Nasr	AIS Officer
France	Mr. Patrick Simon	Toulouse ROC & RODB Manager, Météo France
Iran	Mr. Majid Yarandi	Aero-ICT General Manager
	Mrs. Narges Assari	AIS Expert-in-charge
	Mr. Alireza Khodadoost	Software Department Chief
	Mr. Sina Peyman	CNS Expert
Iraq	Mr. Ibrahim Sabah Naiem	AWOS System Supervisor
Jordan	Mr. Dafi Mohammad M. Elryalat	ANS Inspector
	Mr. Areej Said Khaled Al Ajou	ANS Inspector
	Mr. Yaser Mustafa Issa Ziad	Chief of AFS Engineering Division
	Mr. Mahmoud Hatem M. Ibrahem	Chief of Comm. & Navigation

State Org/Industries	Contact	Title
	Mr. Yousef Arafat	Supervisor of Comm. & Navigation
	Ms. Lina Ahmad Yousef Abuawad	AFTN/AMHS System Engineer
	Mr. Amer Mohammed T. Yousef	AFTN/AMHS System Engineer
	Mr. Abdelhalim A. Jundi	AFTN/AMHS System Engineer
	Ms. Suzan Saqor M. Alzoubi	Chief of Communication Systems
Kuwait	Ms. Fatemah Al-Dabbou	Electronic Engineers
	Mr. Naser Al-Hubail	Head of AFTN
	Mr. Hasan Al-Attar	Communication Engineers
Lebanon	Mr. Marc Wehaibe	Acting Director of Meteorological Dept
	Mr. Abdel Rahman Zawawy	Head of Forecasting Department
	Mr. Faysal Al Banna	Acting Head of Ground Observation Division
	Mr. Wissam Abou Khoucheeh	Forecaster – Meteorological Department
	Mr. Said Mohammed Elgharli	Chief of Meteo. Telecommunication
	Mr. Wissam Mahmoud Dordab	Head of Meteorological Observation Section
Oman	Mr. Said Al Harthy	Director of MET Technical Services
	Mr. Juma Al Maskari	Director of MET Technical Services
	Mr. Majid Al Hakmani	Chief of MET Application & Network
	Mr. Malik Al Huseini	Chief of Aviation Weather Forecast
Qatar	Mr. Hany Ahmed Sallam	Network Engineer
	Mr. Ahmed Al-Eshaq	Air Navigation Director
	Mr. Mehdi Sahbi	Electronic Engineer
	Mrs. Pamela Erice	AIM Supervisor
	Mrs. Sheila Brizo	PANS-OPS Specialist
	Mr. Asiri Christo	AIM Officer
	Dr. Ahmad Abu Obeid	Meteorological Consultant
	Mr. Al-Sendibad Said Shehadeh	Maintenance Engineer
	Mr. Hany Ahmed Sallam	Network Engineer
	Mr. Majid Fahad Alkuwari	Electrical Engineer
	Mr. Karl Alexander P. Vasquez	Network Engineer
	Mr. Khalid Hussain Abdulla	Electronics Engineer
Saudi Arabia	Mr. Hussain M. Alghubari	Accident and Incident Manager
	Mr. Saad Mohammed Almajnooni	Information and Regional Centers, GD
	Mr. Ridha Dridi	Technical and Safety Advisor
	Mr. Faisal A. Alzahrani	Automation Engineering Supervisor
	Mr. Mohammad Abdullah Mahnashi	System & Technical Supervisor
	Mr. Fahad Yahya Aseeri	ATM System Specialist
	Mr. Tariq Abbas A. Alsulamani	Computer Engineer

State Org/Industries	Contact	Title
	Mr. Bassam Ahmed A. Alghamdi	Air Navigation Safety Inspector
	Mr. Faris Abdulwahab Alzahrani	Air Navigation Safety Inspector
	Mr. Jamal Ageel Al-Anazi	Air Navigation Safety Inspector
	Mr. Khalid Alhazmi	Communication Engineer
	Mr. Rakan Abdulhameed Abalary	ASD Reporting and Analyzing Data Specialist
	Mr. Mohammad Al Shareef	Manager of Observation Asset
	Mr. Fawzi Zin Alabidine	Meteorological Regulation Director
	Mr. Majed Khalid Majoub	Traffic Officer
	Mr. Mansour Murtakh Punjabi	Traffic Officer
	Mr. Abdulkareem S. Mahjoub	Traffic Officer
	Mr. Sami Al Wafi	Forecaster
Sudan	Eman Hassan Sultan	Meteorologist
	Hussein Babiker Gadalla Ahmed	Aviation meteorologist focal point
	Mr. Mohamed Awadallah Alsheake	Senior Meteorological Authority
	Mr. Shakir Salaheldin Mohamedsaeid Algamal	Air Traffic Controller
Syria	Mr. Nadim Salim	Director of CNS
	Mr. Khaled Rajab	Deputy of Director of CNS
	Ms. Ola Faraj	Head of AFTN Department
	Mr. Ayman Moussa	Chief of AFTN Section
	Mr. Aiham Ahmad	Chief of Communication
UAE	Mr. Jacob Avis	Inspector Air Navigation CNS
	Mr. Herman Groenewad	Senior Inspector - AN
	Ms. Mouza Mohammed Al Sawafi	Search and Rescue Inspector
	Mr. Robert Nova Bara	Air Navigation Inspector
	Mr. Sultan A. Mohamed Lootah	Inspector – Air Traffic Services
	Mr. Ahmad Saleh Aljasmi	Aviation Weather Forecaster
USA (FAA)	Mr. Joe Knecht	IT Specialist, Interprise Product Support
	Mr. Michael Graf	Meteorologist/International Liaison
GCC	Mr. Said Hamed Alsarmi	Meteorological Expert
IFATCA	Mr. Raouf Helmy	IFATCA Representative Middle East
WMO	Mr. B. L. Choy	Hong Kong Observatory on behalf of WMO TT-AvData
ICAO	Mr. Christopher Keohan	RO/MET – ICAO EUR/NAT
	Ms. Muna Alnadaf	RO/IM – ICAO MID
	Mr. Radhouan Aissaoui	RO/CNS – ICAO MID

State Org/Industries	Contact	Title
	Mr. Hany Bakr	RO/AVSEC/FAL – ICAO MID
	Mrs. Manal Wissa	Programme Analysis Associate – ICAO MID

- END –