ELEVENTH MEETING OF THE AFI TACTICAL ACTION GROUP (TAG/11)

SUMMARY OF DISCUSSIONS

(Johannesburg, 8 March, 2019)

Prepared by the TAG Secretariat

The views expressed in this Summary of Discussions should be taken as those of the Tactical Action Group (TAG) and not of ICAO. This Summary of discussions will, however, be submitted to the respective parties for necessary action.

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PART I – HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Eleventh meeting of the AFI Tactical Action Group (TAG/11) was held at the offices of the International Air Transport Association (IATA) in Sandown, Johannesburg, South Africa, on 8 March 2019.

2. OPENING

2.1 Mr. Albert Aidoo Taylor, Regional Officer ATM, WACAF Regional Office, thanked IATA, on behalf of ICAO, the ARMA and TAG Core Members, for hosting the event and providing substantial amount of resources and time in supporting the TAG. He expressed his appreciation to the participants for their continued support and commitment to the objectives of the TAG and entreated the Group members to be the instruments for the change which the TAG needs to be effective and relevant.

2.2 He acknowledged the huge amount of work and successes which were chalked by the TAG under the direction of Mr. Seboseso Machobane, the immediate past Regional Officer ATM/SAR, ESAF Regional Office and Secretary of TAG, and thanked Mr. Machobane who retired from ICAO at the end of June 2018 for his distinguished service to TAG and wished him well in his retirement from active service.

2.3 He informed the meeting about the appointment of Ms. Keziah Ogutu from Kenya as the new Regional Officer ATM/SAR, ESAF Regional Office, noting, that Ms. Ogutu has been an active member of the TAG and brings on-board a wealth of experience to help progress ATM issues in the AFI region as a whole, and in particular the work of ESAF and TAG.

2.4 Mr. Protus Seda OTIENO, Assistant Director, Safety and Flight Operations, ATM Africa & Middle East (AME), welcomed the TAG on behalf of IATA. In his welcome remarks, Mr. Otieno expressed IATA's happiness in hosting the TAG. He indicated that the Group had chalked some successes in the past but has in recent years appear to have lost steam. He challenged the team to reinvent itself and revamp in order to bring about the change so desperately needed, and suggested to the TAG to adopt the Go-Team approach of raising issues and addressing them timeously.

3. OFFICERS AND SECRETARIAT

3.1 Mr. Albert Aidoo Taylor, Regional Officer ATM/SAR, WACAF Regional Office assumed the responsibility as Secretary of TAG and moderated the deliberations with the support of Mr. Prosper Zo'o Minto'o, Deputy Regional Director, WACAF Office. Mr Protus Seda Otieno; and Mses. Lindi-Lee Kirkman and Ranganai Dandajena (IATA), Mrs. Tembisa Maphike, ATNS, Ms. Mwanajumaa Kombo, Tanzania provided Rapporteur support.

4. ATTENDANCE

4.1 The TAG/11 meeting was attended by Thirty (30) participants from TAG Core States and Organizations (ARMA, ATNS, ASECNA, KCAA, IATA, IFALPA, IFATCA, WACAF Offices; six (6) invited States (Angola, Cape Verde, Nigeria, Senegal, South Africa and Tanzania) and US FAA. The list of participants is at Attachment A to the report.

5. LANGUAGE

5.1 Discussions were conducted in the English language and documentation was issued in the same language.

6. AGENDA

Agenda Item 1: Adoption of the agenda

The following was adopted as agenda for the meeting:

Strategic Objective	Agenda Item No.	Subject
A	1	Adoption of the provisional agenda
A	2	Review of the status of UCRs and States' responses in 2018
A	3	Progress on States' actions to reduce UCRs
A	4	States/FIRs specific issues
A	5	Review of the outcome of the Sixteenth Meeting of the Air Traffic Services (ATS) Incident Analysis Group (AIAG/16)
A	6	Specific reduced vertical separation minima (RVSM) issues
A	7	Review of the TAG terms of reference (TOR)
	8	Any other business (AOB)

Agenda item 2: Review status of UCRs and States' responses in 2018

2.1 The meeting noted that the monthly teleconferences had ceased since the retirement of Mr. Machobane, the last one was held on 26 April 2018.

2.2 Statistical Reports

2.2.1 The last monthly teleconference was held in April 2018. The UCRs for the remaining months of 2018 therefore could not be analyzed prior to the TAG/11 meeting. Considering the fact that the TAG meeting was for only one day, it was agreed that we could not analyze the UCRs for the remaining months. The TAG agreed that IATA, ICAO, ARMA and AIAG Chair analyze the outstanding UCRs from May to December 2018 and decide as appropriate on the remaining UCRs.

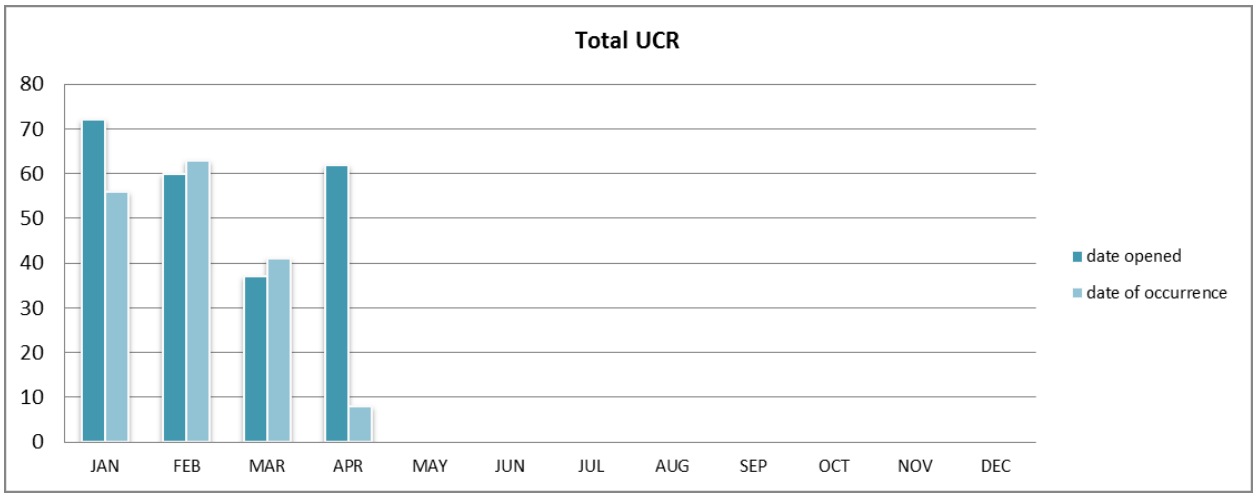

Fig. 1 Date of UCR Occurrence and Date Opened

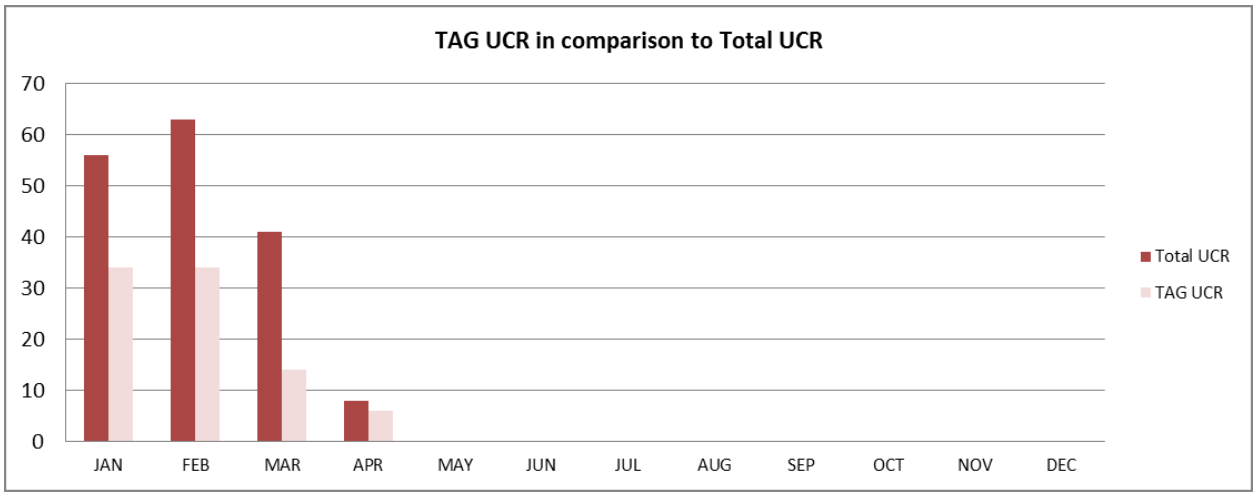

Fig. 2: January 2018 to February 2019, 52% of all events took place in the RVSM airspace (TAG UCR)

2.2.2 AIRPROX, ATS and Communication events are common to both the RVSM airspace as well as the airspace below FL290. Historically, other categories including aircraft operations and coordination are common to both RVSM and non-RVSM airspace. In 2018, 100% of all coordination, 92% of all communication and 47% of all AIRPROX events took place in the RVSM airspace; whilst only 31% of all ATS events occurred in RVSM airspace. (Fig. 3)

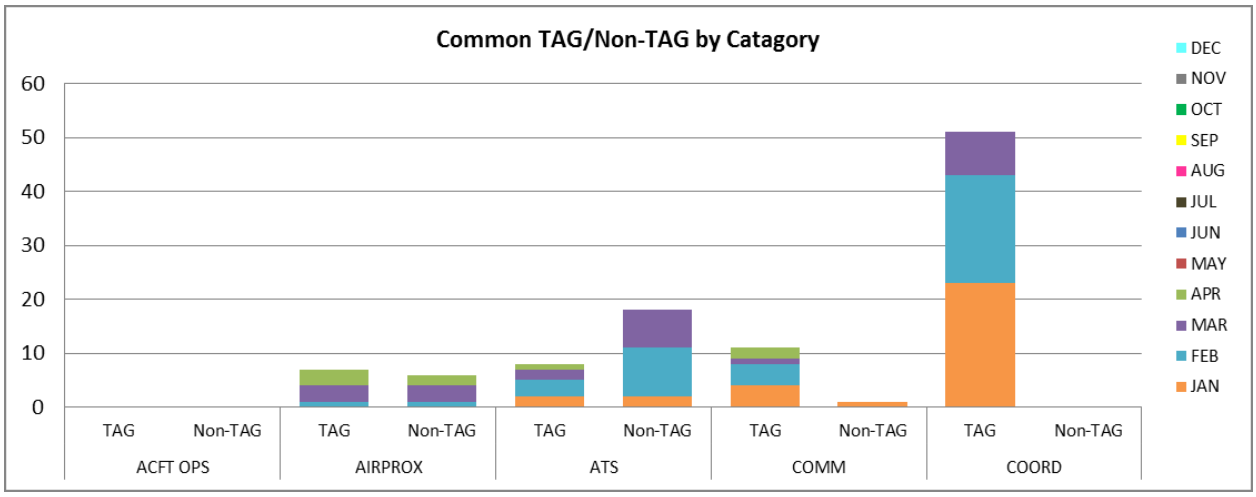

Fig. 3

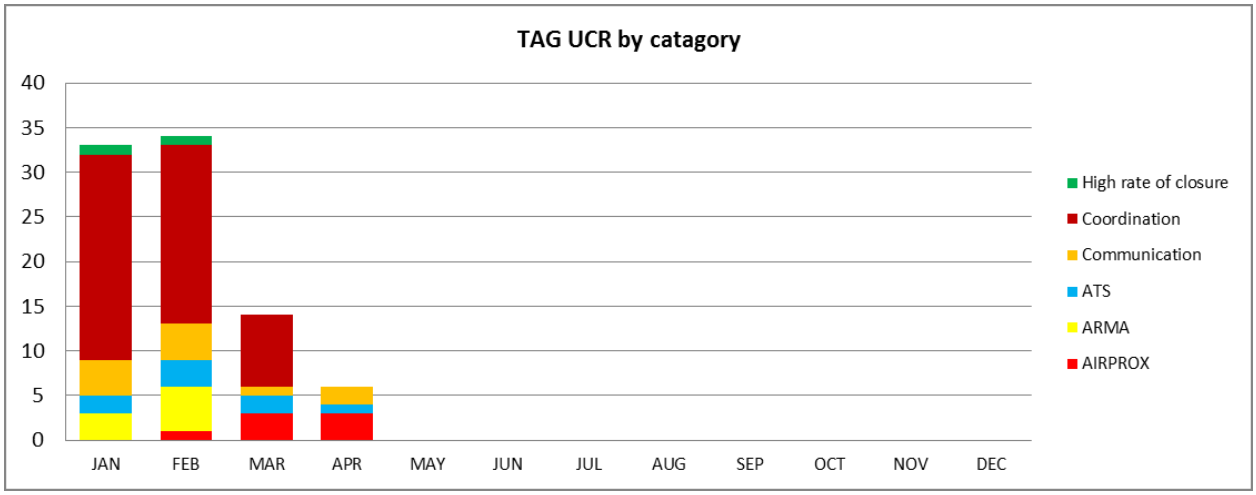

Fig. 4 TAG UCR by Category

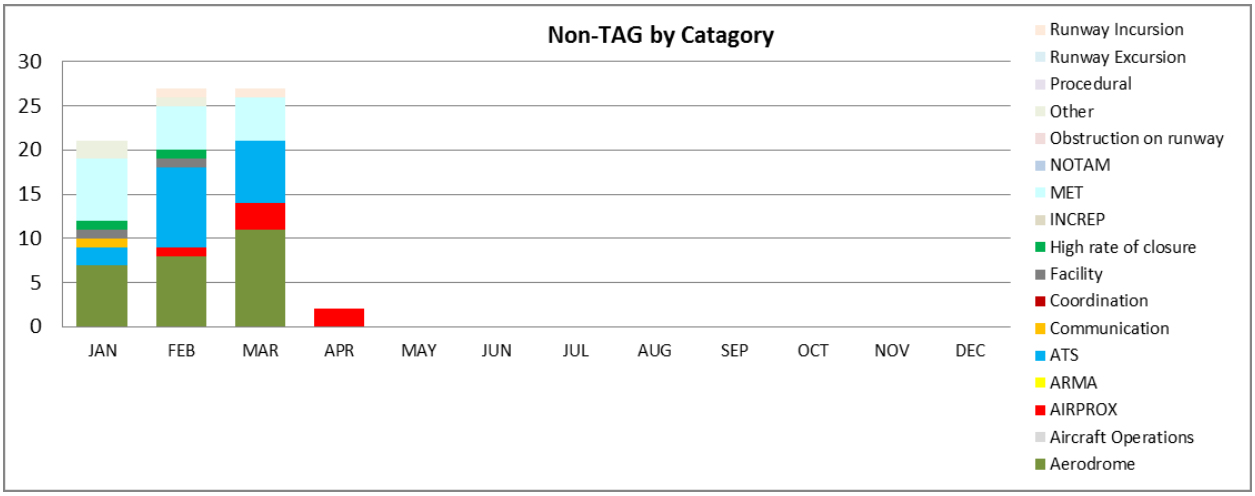

Fig. 5: Non-TAG by Category

2.2.3 In the airspace below FL290, the most prevalent classification of events is aerodrome (34%), followed by ATS (23%) and MET (22%). The TAG recommended for scrutiny action for UCRs in non-RVSM airspace, and pay particular attention to increasing trend of incidents at or in the vicinity of aerodromes.

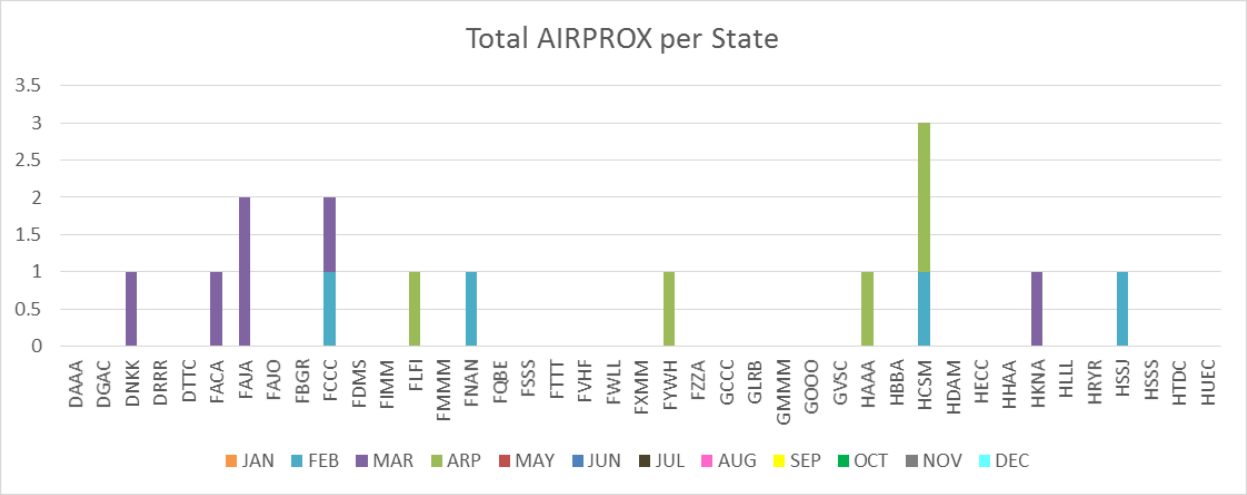

Fig. 6: AIRPROX per State

2.2.4 The TAG took note of the high number of AIRPROXES in Mogadishu FIR and called for an urgent action to address the contributing factors.

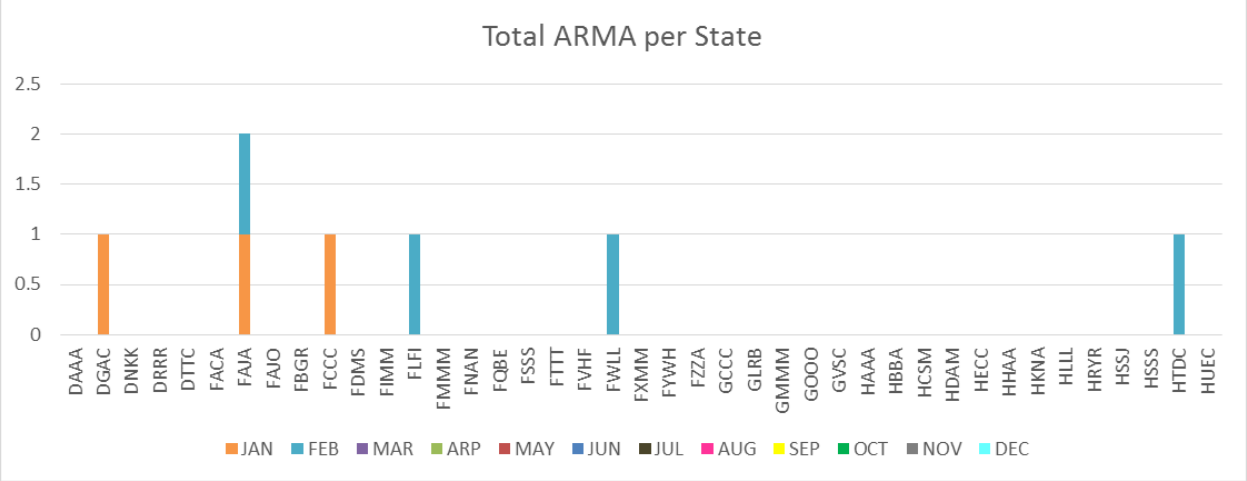

Fig. 7: Total ARMA Events per State

2.2.5 South Africa (FAJA and FACA) is the biggest contributor to ATS events with 23% followed by Somalia (HCSM) with 19%. Kenya (HKNA), with 11% is third and South Sudan (HSSJ) and Tanzania (HTDC) each contribute 8%.

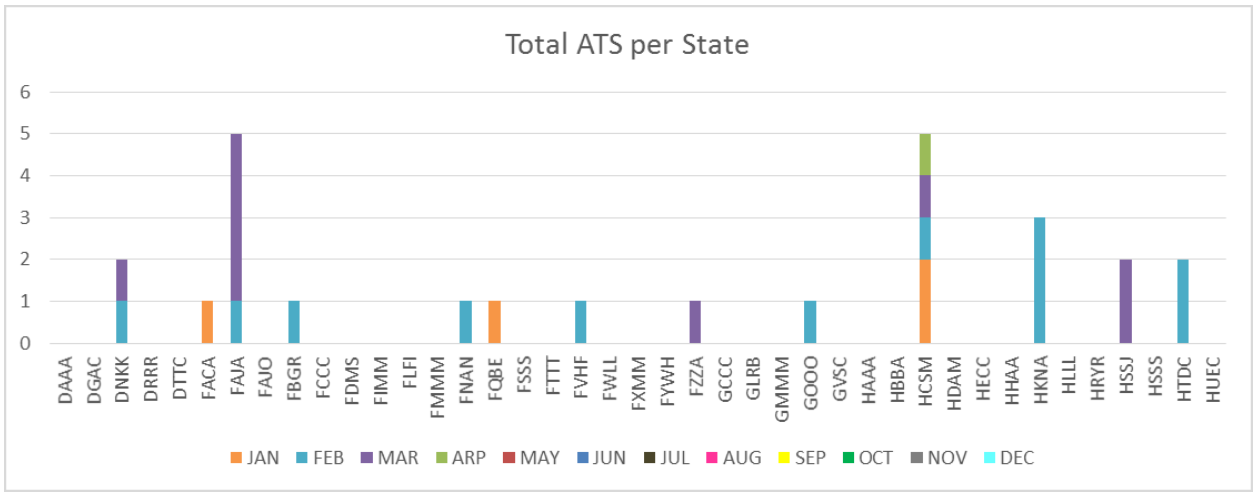

Fig. 8: ATS Events by State

2.2.6 South Africa (FAJA and FACA) is the biggest contributor to ATS events with 23% followed by Somalia (HCSM) with 19%. Kenya (HKNA), with 11% is third and South Sudan (HSSJ) and Tanzania (HTDC) each contribute 8%.

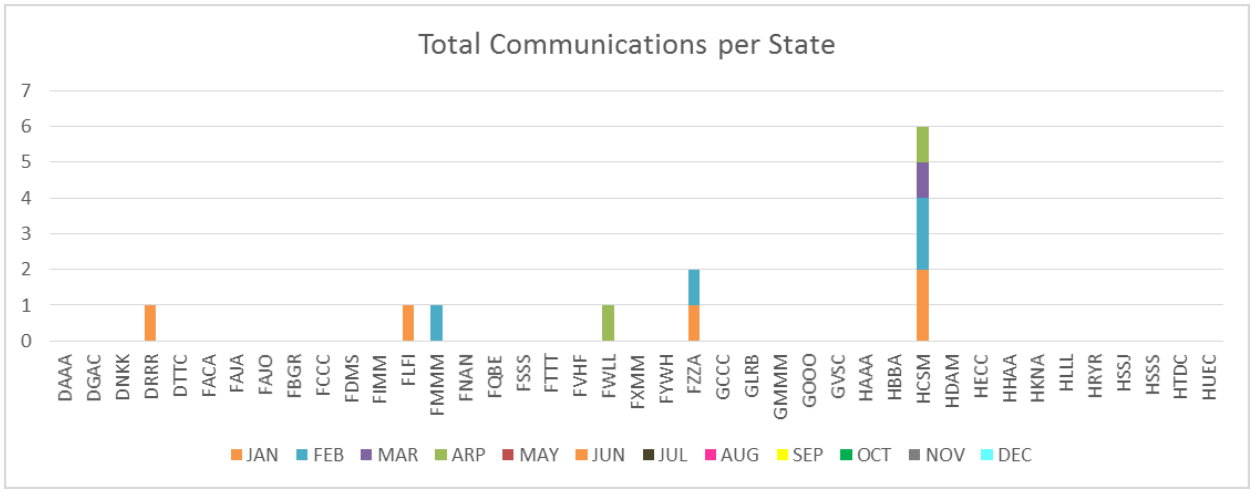

Fig. 9: Communication

2.2.7 The highest contributor to communications is Somalia (HCSM), who accounts for 50% of all Communication events for 2018 thus far. DRC (FZZA) is the next highest contributor with 17%. The meeting recommended for FIR Coordination Meetings to be conducted under the aegis of ICAO to address the trend of unsatisfactory condition reports in Mogadishu and Kinshasa FIRs.

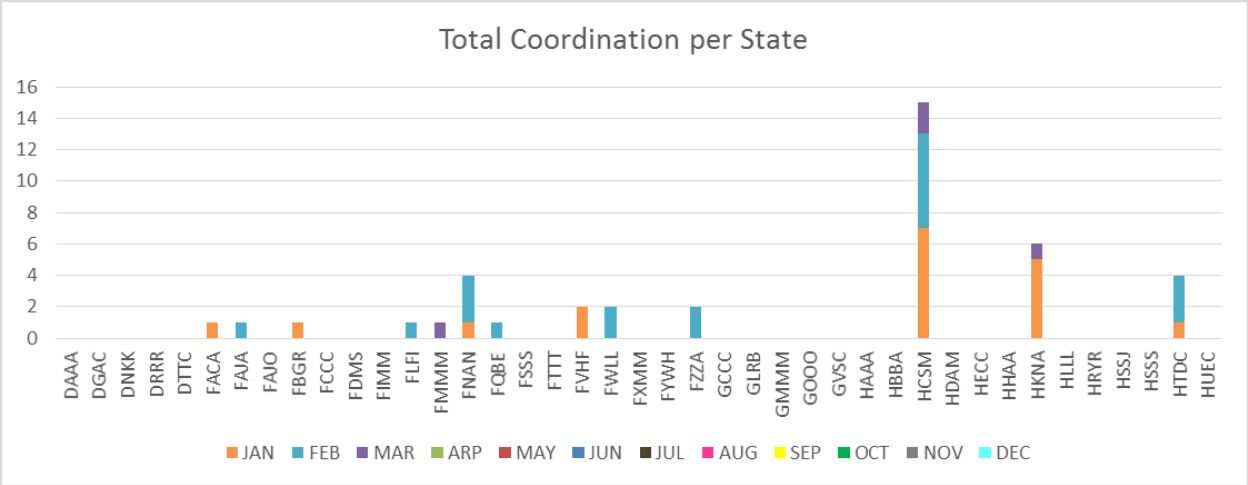

Fig. 10: Coordination

2.2.8 37% of coordination events took place in Somalia (HCSM) whilst Kenya (HKNA) accounts for 15% whilst Angola (FNAN) and Tanzania (HTDC) each contribute 10%

2.2.9 IATA presented a total of Eighty-Nine (89) UCRs which remain open to the TAG for assessment and appropriate action in accordance with TAG Terms of Reference. However, considering the fact that the face-to-face meeting was just a day's session, it was decided that the TAG/11 was unable assess all the open UCRs. The secretariat was therefore requested to liaise with IATA, ARMA, AIAG Chairman to review the open UCRs for the records and appropriate actions.

2.2.10 The TAG noted that 61% in RVSM UCRs were filed late and called on States, ANSPs and Airlines to endeavour to file UCRs promptly to enable effective trend analysis and timely action were necessary to address safety risks.

2.2.11 Action Items:

a) **States/ANSPs should be sensitized about the increasing trend of incidents at or in the vicinity of aerodromes and be requested to identify and take proactive measures to resolve the causes and contributing factors, and inform ICAO of corrective actions taken;**
b) **Somalia be informed of the high number of AIRPROXES in Mogadishu FIR which is safety risk and request for urgent action to address the unsatisfactory conditions in the FIR;**
c) **The meeting recommended for FIR Coordination Meetings to be conducted under the aegis of ICAO to address the trend of unsatisfactory condition reports in Mogadishu; and**
d) **IATA, ICAO, ARMA and AIAG Chair should analyze the outstanding UCRs from May to December 2018 and decide as appropriate on the remaining UCRs.**

Agenda Item 3: Progress on States' actions to reduce UCRs

Verbal updates were provided by some of the States/ANSPs that were invited to the TAG/11.

3.1 South Africa

3.1.1 South African reported that the analysis of UCRs as identified by the AIAG and the recommendations made will help in addressing the causes of ATS infringements and AIRPROXES. South Africa informed the TAG that the increase in number of incidents were partly due to increase in air traffic movement in some sectors thereby increasing the number of coordination and ATC workload, high number of ongoing ATC

training, and brain-drain of high number of well-trained and experienced air traffic controllers leaving the service to seek greener-pastures externally. Furthermore, the increase in the high number of incidents from high rate of climb was attributable to incorrect usage of phraseology, pilot procedures and weather restrictions.

3.1.2 IFALPA promised to provide some information and operational guidance material for pilots with respect to high rate of climb.

3.2 Tanzania

3.2.1 Tanzania reported that the recommendation which were made by TAG/10 contributed immensely towards the actions taken to address the challenges which were encountered in the past, resulting in installation of new ATS equipment and facilities, thus resulting in significant reductions in incidents, especially in Dar es Salaam.

There is significant traffic growth mostly in Kilimanjaro and in Zanzibar – where traffic has tripled over the last few years. Introduction of new radars and training of a number of ATCOs are expected to address ATC capacity challenges as a result of growing traffic.

Dar es Salaam ACC had a lot of coordination issues with Lusaka ACC which necessitated many meetings between the two ATC units to review the LOPs, and establishment of a team to investigate root causes to the recurring coordination failures. The underlying causes have been identified and action is being taken on both sides to resolve the problems. The TAG requested Tanzania to provide periodic updates of progress in the implementation of corrective actions.

3.3 Angola

3.3.1 Angola informed the TAG of ongoing activities to legally and functionally separate the Air Navigation and Airports services. There is ongoing reorganization of the Luanda airspace and upgrade of ATM systems to enhance operational safety and efficiency. An aggressive refresher and Aviation English Language Proficiency training of air traffic controllers. Twenty-Two (22) controllers received refresher and English training, 46 ACC and 6 APP controllers received refresher training in 2018; refresher training is planned to continue in 2019.

Angola will host some aviation meetings including CAFSAT Network Management Committee/19, SAT FIT/14 and SAT /24 meetings in Luanda in June 2019.

3.3.2 IATA presented Angola with the outcome of Communication survey which was conducted with the support of its member airlines in October 2018, pursuant to APIRG conclusion. The result of the survey indicates a score of 50% readability for Angola. Some specific portions of the Luanda FIR recorded high numbers of communications failure. However, it was reported that the availability of CPDLC compensated for the lack of VHF radio communications.

3.3.3 In response, Angola reported that some pilots have been calling on other means on communications (e.g. CPDLC) when ATC expected a call on VHF, there causing frequency-separation and confusion in ATC operations. Angola was requested to publish procedures as appropriate to indicate the primary, secondary and other back-up communication modes to resolve any ambiguity and reduce the safety risks resulting from communication failures.

3.3.4 Angola was reminded of an ICAO State Letter which was sent to the State on serious incidents of coordination failures with neighbouring FIRs/ATC units following SAT/23 meeting in Durban in June 2018. Angola has neither acknowledged receipt nor provided evidence of addressing the safety risks reported, and was accordingly requested to take the necessary steps to address the recurring trend of communication and coordination failures in the Luanda FIR.

3.3.5 Overall, the TAG commended Angola for the significant improvement to ATS infrastructure and services and urged the State and service providers to stay the course of improvements.

3.4 ASECNA

3.4.1 ASECNA informed the TAG that Air Portugal was not using CPDLC which is primary means of communications in Oceanic and requested IATA's assistance to enable Air Portugal comply with the requirements. The report was collaborated by Senegal CAA and informed the meeting that Portugal was informed about the problem and requested to help resolve the issues. However, the situation has not improved.

3.4.2 ICAO was requested to advise if the use of CPDLC can be mandated for aircraft operating in the high-seas. The FAA urged that the use of CPDLC should be considered alongside the need to achieve and maintain the required RVSM Target Levels of Safety, and gave the example of EUR/NAT region where the use CPDLC was mandated by PIRG, noting, that APIRG could consult with all other stakeholders and coordinate the implementation of appropriate technology over the high seas.

3.5 Carbo Verde

Carbo Verde reported of coordination and transfer of control challenges with Dakar Oceanic regarding CPDLC next data authority. The TAG request ASECNA and Carbo Verde to have a side meeting to agree on a common solution to the problem and amend the ATC LoPs accordingly for applicability.

3.6 Action Required:

a) IFALPA provides information and operational guidance material for pilots with respect to high rate of climb;

b) Tanzania to provide periodic updates on progress made in the implementation of corrective actions to address the high number of coordination failures with its neighbouring FIRs;

c) Angola is urged to publish procedures as appropriate to indicate the primary, secondary and other back-up communication modes to resolve the ambiguity of pilots communicating on other modes other means expected by ATC;

d) Angola to respond to the ICAO State Letter on serious incidents of coordination failures with neighbouring FIRs/ATC units following SAT/23 meeting in Durban in June 2018, take appropriate corrective actions and provide evidence of the effectiveness of such actions in addressing the recurring trend of communication and coordination failures in the Luanda FIR;

e) Sal and Dakar Oceanic FIRs to find a common solution to the transfer of control challenges with regards to CPDLC next data authority and amend their ATC LoPs accordingly for implementation; and

f) ICAO is requested to advise if the use of CPDLC can be mandated for aircraft operating in the high-seas.

Agenda Item 4: States/FIRs specific issues

4.1 Somalia / Mogadishu FIR

4.1.1 The TAG reviewed all the incidents in the Mogadishu FIR and concluded that Mogadishu was either the highest or among the highest in all the UCR indicators namely, ATS events, AIRPROXES, Communication Failures, Coordination Failures. The TAG took note of the recurring incidents of Mogadishu FIS issuing positive ATC Clearances and Instruction in Class G airspace and further noted, that all the incidents occurred within RVSM airspace. The TAG was also briefed of the lack of coordination between Yemen (Sanaa FIR) and Mogadishu thereby exacerbating an already precarious operational environment.

4.1.2 The TAG was apprised of ongoing projects coordinated by ICAO TCB which included relocation of Mogadishu FIS from Nairobi to Mogadishu on 18 June 2018, implementation of CPDLC and a roadmap for providing positive ATC service with a target date of June 2019, though there are challenges in obtaining approval of the enabling Act of Parliament.

4.1.3 The TAG considered the all the reports and discussion on UCR in the Mogadishu FIR and debated whether the conditions therein meet the technical requirements and prerequisites in ICAO Doc (9937 and 9574) for RVSM implementation and sustainable operations. The meeting recalled the AFI region decided to implement RVSM as a block to avoid the more complicated RVSM transitional issues.

4.1.4 The TAG recalled that its primary responsibility was to monitor unsatisfactory condition reports which have the potential to reduce the regional RVSM TLS and therefore expressed grave concerns about the situation in the Mogadishu FIR for being the highest contributor and threat to maintaining the AFI Region RVSM safety targets. Consequently, the TAG with reference to its mandate and TOR decided that the conditions prevailing in Mogadishu FIR is a specific situation and accordingly called for specific actions to resolve the safety risks.

4.1.5 Action required:

a) The following tactical actions were agreed by the Group:
b) TAG Technical missions (comprising of ICAO, IATA, ARMS and Airline operators) to Mogadishu;
c) Secretariat is requested to obtain status report of the ICAO TCB project for Mogadishu and provide a briefing to the TAG;
d) TAG members are to liaise with ICAO and support ongoing activities which are aimed at upgrading the airspace from Class G to Class A;
e) ARMA was urged to consider conducting a Mogadishu specific Collision Risk Assessment,
f) A comprehensive UCR report be sent to ICAO regarding the high number of incidents in the FIR, particularly in the airspace over the high seas.
g) ICAO should organize a Coordination Meeting with respect to Mogadishu FIR and ensure the participation of adjacent States/FIRs/ATC units, in particular Sanaa and Asmara; and
h) FIRs co-ordination meeting with Mogadishu should among others should the existing airspace structure, route network, Hotspots and applicable ATC procedures.

4.2 Democratic Republic of Congo /Kinshasa FIR

4.2.1 The TAG was briefed on the report of the IATA coordinated communications surveys conducted for Kinshasa which showed that a decrease from 80% in 2017 50% in 2018 dropped to 50%.

4.2.2 Considering the size and position of Kinshasa FIR in the middle of the region and the challenges in coordination with adjacent FIR/ATC units, TAG recommended that Technical mission should be conducted to the DRC, and urged ICAO to facilitate the organization of a Kinshasa FIR Coordination meeting at a suitable date and ensure the participation of adjacent States/FIRs/ATC units.

4.3 FIR Coordination Meetings for States/FIRs with high numbers of Coordination Failures

4.3.1 The TAG recommended for inter FIR Coordination meetings to be held for the following FIRs:

a) Addis Ababa
b) Gaborone or Lusaka FIRs; and
c) Kinshasa

4.3.2 ICAO was requested to facilitate the organization of the inter FIRs Coordination Meetings, endeavour to ensure participation of all neighbouring FIRs and/or ATC centres.

4.3.3 Action Required:

a) ICAO to facilitate Coordination Meetings for Addis Ababa, Kinshasa and either Gaborone or Lusaka FIRs, and ensure the participation of neighbouring FIRs and/or ATC Units to resolve the high numbers of Coordination Failures;

b) ICAO is requested to coordinate a TAG Technical Mission to the DRC back-to-back with a Kinshasa FIR Coordination meeting, and at a suitable date to ensure the participation of adjacent States/FIRs/ATC units.

Agenda Item 5: Review of the outcome of the Sixteenth Meeting of the Air Traffic Services (ATS) Incident Analysis Group (AIAG/16)

5.1 The Group noted that the AIAG/16 meeting reviewed 61 UCRs.

5.2 The TAG discussed the Findings and Recommendations from AIAG/16 and made the following observations on the outcome:

5.3 Findings:

The TAG observed that the number of UCRs recorded had again continued to reduce, indicating a higher probability that the measures taken by the TAG and States/ANSPs might be yielding positive results. The meeting resolved not to be complacent but assiduously work towards further reduction in the number of UCRs, being mindful of the AFI ANS Performance Target requiring all States to continuously reduce the rate of aircraft proximity (AIRPROX) occurrences in their managed airspace to attain and maintain a level of zero (0) AIRPROX by the end of 2020.

5.4 The under listed were identified as causes and contributory factors to UCRs:

- ATM Operations and Airspace Structure (largest cause of concern, particularly in Mogadishu)
- Procedural Non-Compliance
- Human Factors
- Communications
- Equipment
- Data and Display
- Cockpit
- Drone Encounter
- ATS issued instructions in G Airspace.
- ATS Lack Situational Awareness in G Airspace
- Weather
- In HSSJ, Human Factor due to busy airspace with combined APCH and TWR.
- Lack of SIDS /STARS
- Use of non-standard phraseology

5.5 Recommendations:

States/ANSPs

- Conduct ATC Units Capacity Assessment and increase staffing levels as appropriate
- Place more emphasis on implementation of Safety Management Systems
- Place more emphasis on ATC refresher training to include contingency procedures
- Implement training for ATS supervisors to enhance effective supervision
- Implementation of Safety Nets
- Promote and Implement Just Culture
- Review of ATM Procedures and implementation of Civil/Military Cooperation

- Implementation of Change Management along with new concepts of operation and equipment
- Establish and enforce regulations on Remotely Piloted Aircraft Systems (RPAS)
- Establish and publish VHF/CPDLC/HF usage procedures in AIPs
- Improve regulatory oversight of ANS Providers
- Resolve deficiencies uploaded in the AANDD regularly and inform ICAO to validate resolution of the deficiencies.

5.6 AIAG Secretariat

- Review Methodology and Table, to read Causal Factors, use ICAO Designators, include feedback timelines, and development of a formal feedback mechanism for individual State responses to AIAG
- Present comprehensive report on AIAG activities to APIRG

5.7 ICAO

- Inform States of deficiencies identified by AIAG through individual State Letters
- Upload deficiencies identified by AIAG on the AFI Air Navigation Deficiency Database (AANDD) and urge International organizations (IATA, IFALPA, IFATCA) to monitor AANDD for resolution of deficiencies
- Urge States with outdated AIP to update as appropriate
- Assist with airspace organization, coordination and review of procedures to improve safety and efficiency of flight operations

5.8 IATA and Airspace Users

- Encourage the use of IFBP in FIRs where still applicable.
- Aircrew should comply with procedures calling for establishing contact 10 minutes call prior to entering a new FIR.
- Aircrew to be encouraged to submit detailed reports.
- Publish Special Emphasis Bulletin on IFBP for pilot and ATC Situation Awareness and understanding that ATS is advisory only.
- Airline operators are encouraged to equip and operate ADS-C/CPDLC
- Airline operators are urged to file and submit Air Safety Reports
- IATA to submit de-identified reports of UCRs to AIAG members prior to AIAG meetings to allow better preparations.

5.9 Mogadishu FIR

- Reorganize and establish Class-A airspace and implement applicable procedures
- Investigate “Hot Spots” over HARGA, EVEBU, MOGDU, AVEDA, RAGGS and implement corrective measure
- Provide ATS refresher training on advisory services to air traffic advisory personnel
- Consider separating Approach Control Unit and Aerodrome Control Tower functions
- Upgrade of all communications
- Be requested to provide feedback on ASRs/UCRs.

5.10 Follow-up mechanism:

The TAG is urged to conduct the monthly teleconference to review UCRs, obtain feedback from states on implementation of corrective actions.

Agenda Item 6: Specific reduced vertical separation minima (RVSM) issues

6.1 Coordination Failures

6.1.1 The TAG was informed of the outcome of ARMA's initiatives to identify and address risks associated with coordination failures which has encouraged some FIR/ACC's to voluntarily report coordination failures to ARMA.

6.1.2 Previously, equipment failure was reported and identified as a contributing factor, however this has decreased significantly. Currently, Human Factors at ACC had been identified as the main contributing factor to coordination failures. The revised RVSM Large Height Deviation definition now includes the resultant outcome of coordination failures and reads as follows:

6.1.3 Large Height Deviation (LHD). A vertical deviation from an ATC assigned or coordinated altitude that results in an error of 300 ft. or more. The deviation may be the result of human error, equipment malfunction or environmental factors such as turbulence, and should be reported in accordance with the LHD types.

6.1.4 In addition, a new trend of LHD, Code E - Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of Human Factors (e.g. late or non-existent coordination; incorrect time estimate/actual; flight level, ATS route, etc. not in accordance with agreed parameter has been included as contributing factor to LHD.

6.1.5 The TAG was informed on the increasing number of coordination failure between Sanaa and Djibouti, Sanaa and Mogadishu and also between Sanaa and Asmara ACCs both of which have significant impact on the AFI RVSM TLS.

6.1.6 The meeting considered the political and security situation in the region which are likely to contribute to the challenges in the airspace. The TAG requested ARMA to compile the details of incidents to ICAO Regional Office for coordination and onward transmission to the ICAO MID Office and possibly Headquarter to address the unsatisfactory condition reports involving Sanaa and Asmara.

6.1.7 The TAG recommended that States and ANSPs in the airspaces and ACCs where high coordination failures were experienced, need to investigate and identify Human Factors causes which leads to coordination failures, and take appropriate steps to address them, including awareness programmes to mitigate human error induced coordination failures.

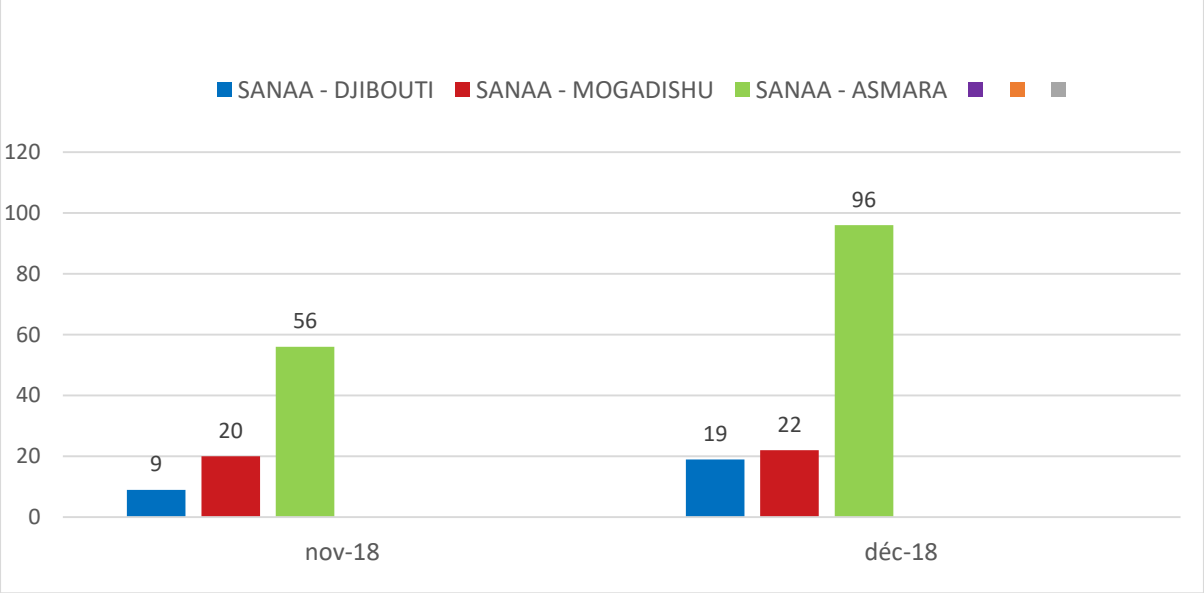

Fig. 11: ATS Coordination

6.1.8 Under-reporting of Large Height Deviation (LHD) from the mathematicians working on the RVSM TLS does help in providing accurate assessment of the safety situation in the AFI region.

6.1.9 The meeting acknowledged the giant strides made by the ARMA over the past 10 years and applauded the contributions made by South Africa, ATNS and in particular recognized the pioneering work done by Mr. Kevin Ewels, the immediate past manager of the ARMA. The TAG welcome Mrs. Nonjabulo Gumede as the new manager of the ARMA and assured her of the Group's support and partnership in meeting the objectives of ARMA.

6.2 Report of Collision Risk Assessment (CRA) 12

6.2.1 The Collision Risk Assessment (CRA) is influenced by the work of TAG and AIAG processes. The TAG was presented with the ninth post-implementation collision risk assessment for RVSM in AFI which addresses two of the AFI RVSM Safety Policy objectives, namely an assessment of the technical vertical collision risk measured against a Target Level of Safety (TLS) of 2.5 × 10-9 fatal accidents per flight hour, and an assessment of the total vertical collision risk measured against a TLS of 5 × 10-9 fatal accidents per flight hour. The technical and total vertical collision risk assessments are based on the data and information available from AFI RVSM operations during the calendar year 2017 as collected and collated by ARMA.

6.2.2 The CRA 12 2017 estimate of the technical vertical collision risk was 1.2 x 10-10 fatal accidents per flight hour, i.e. approximately a factor of 20 smaller than the technical vertical TLS. This estimate was smaller than its CRA 11 2016 counterpart. The decrease was essentially attributable to a decrease in the estimate of the probability of vertical overlap parameter, Pz (1000) of the technical vertical collision risk model. The decrease in the estimate of the probability of vertical overlap is believed to fall within the variation in the height monitoring data used to estimate this probability.

6.2.3 The CRA 12 2017 estimate of the total vertical collision risk was 58.6 x 10-9 fatal accidents per flight hour, i.e. 12 times the total vertical TLS. It was approximately 1.6 times larger than its CRA 11 2016 counterpart. The increase in the CRA 12 2017 estimate of the total vertical collision risk represented the combined effect of increases in the probabilities of vertical overlap due to improper flight level crossings and flying at wrong flight levels. The former increased by a factor of approximately 1.2 and the latter by a factor of approximately 1.8.

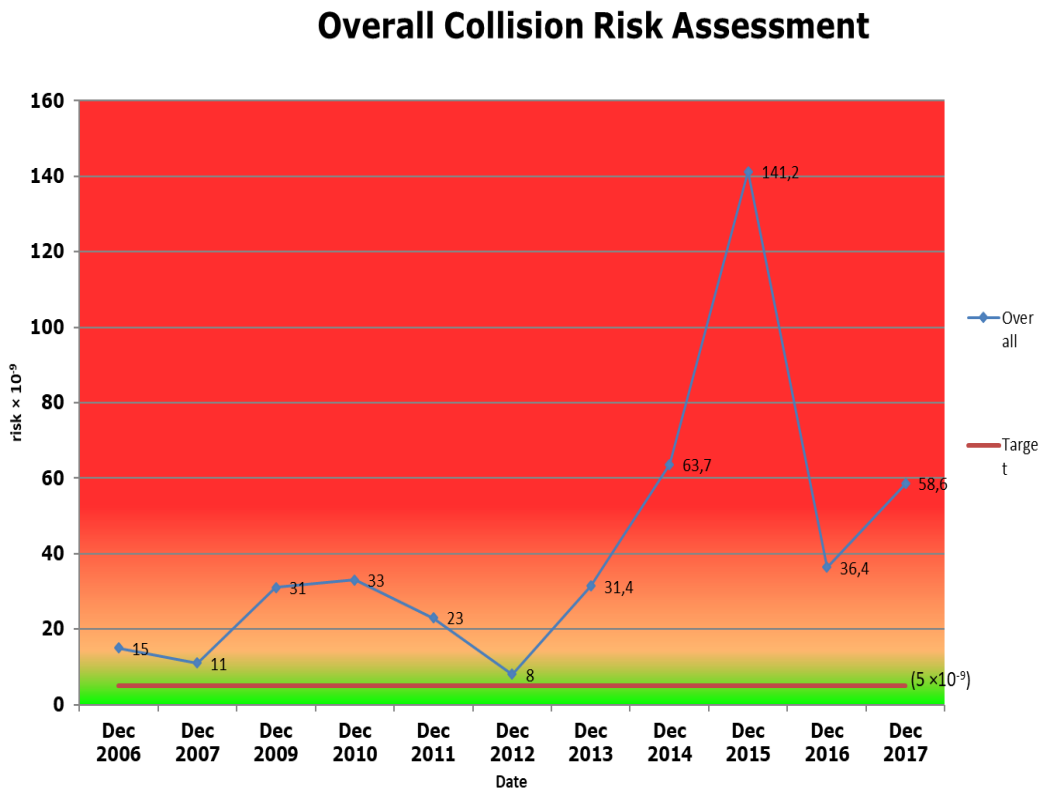
Overall Collision Risk Assessment
160
140
120
100
80
60
40
20
0
risk × 10⁻⁹
15
11
31
33
23
8
31,4
63,7
141,2
36,4
58,6
(5 ×10⁻⁹)
Dec 2006
Dec 2007
Dec 2009
Dec 2010
Dec 2011
Dec 2012
Dec 2013
Dec 2014
Dec 2015
Dec 2016
Dec 2017
Date
Over all
Target

Fig 12

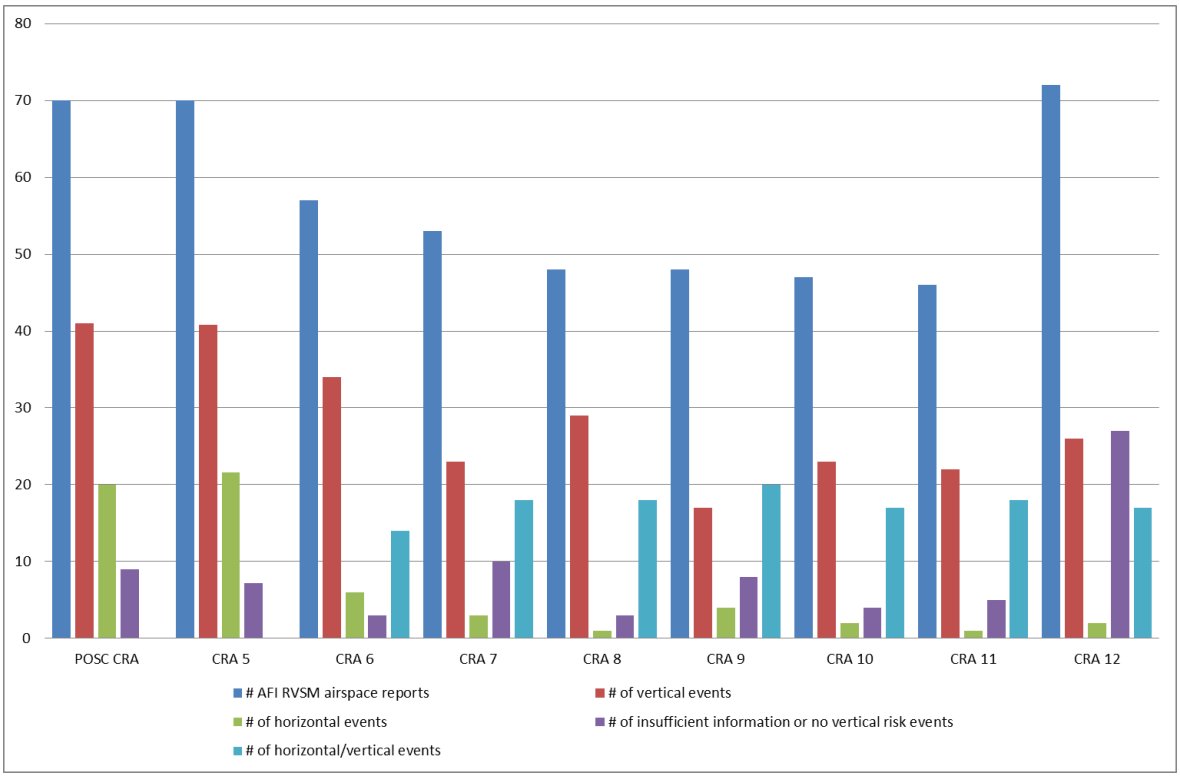
80
70
60
50
40
30
20
10
0
POSC CRA
CRA 5
CRA 6
CRA 7
CRA 8
CRA 9
CRA 10
CRA 11
CRA 12
AFI RVSM airspace reports
of vertical events
# of horizontal events
# of insufficient information or no vertical risk events
# of horizontal/vertical events

Fig 13

6.2.4 Coordination failures contributed significantly to flights operating at incorrect flight levels.

6.2.5 Non RVSM approved aircraft pose a risk in RVSM airspace which has been debated on many occasions and will continue to be pursued. It is believed that TAG/ARMA is managing the occurrences of Non RVSM approved aircraft as best as possible currently.

6.2.6 RVSM system safety must be promoted at every available opportunity so as to reach all RVSM system role-players. i.e. Aircraft Operators, Maintenance Organisations, CAAs, and ANSPs.

6.2.7 The implementation and use of the ICAO Strategic Lateral Offset Procedure (SLOP) within AFI should be encouraged, where applicable, to counteract the adverse effect of very accurate GNSS navigation on vertical collision risk. The safety benefits of the SLOP were not worked into CRA/12 2017 as the implementation of the SLOP has not been completed in AFI Region.

6.2.8 There remain several factors that require the estimate of the total vertical collision risk to be treated with caution. The estimate is most likely affected by under-reporting of vertical events involving large height deviations. Continued efforts to bring the total vertical risk further down to below the total vertical TLS and to improve the event reporting in AFI must be sustained.

FIR/UIR	CRA 12 2017			CRA11 2016	CRA 10 2015	CRA 9 2014	CRA 8 2013
	n_x(opp)	n_x(equiv)		nx(equiv)	n_x(equiv)	n_x(equiv)	n_x(equiv)
Accra	0.003518	0.003675		0.02147	0.02926	-	-
Addis Ababa	-	-		-	-	-	-
Algiers	0.054032	0.059434		0.11381	0.1323	0.09244	0.1446
Antananarivo	0.014816	0.014831		0.01166	0.03665	0.03866	0.03414
Asmara	-	-		-	-	0.01249	-
Beira	0.082251	0.082341		0.15083	0.1175	0.1004	0.1141
Brazzaville	0.017984	0.018808		0.015836	0.1639	0.04408	0.04509
Cape Town	0.000000	0.000006		0.000005	0.000535	0.002702	0.00132
Dakar	0.09205	0.092379		0.072278	0.07351	0.1118	0.1524
Dar Es Salaam	-	-		-	-	-	0.08339
Entebbe	-	-		-	0.02104	0.04153	0.03458

Gaborone	-	-		0.02864	0.05985	0.05603	0.08668
Harare	0.227894	0.228386		0.20042	0.2708	0.2073	0.1714
Johannesburg	0.000049	0.000088		0.00079	0.000493	0.000630	0.00107
Johannesburg Oceanic	-	-		-	-	-	-
Kano	0.102758	0.102794		0.13266	0.1465	-	-
Kinshasa	0.011898	0.011906		-	-	0.02332	0.05528
Lilongwe	-	-		-	-	-	-
Lomé	0.017351	0.018994		-	-	-	-
Luanda	-	-		-	-	-	-
Lusaka	0.035025	0.035304		0.03739	0.03052	0.01617	0.04030
Mauritius	0.005546	0.005548		0.00376	0.005661	0.005167	0.00593
Mogadishu	0.057898	0.057944		0.07546	0.09931	0.03721	0.05657
Nairobi	0.042348	0.045538		0.05673	0.06137	0.01217	0.04528
N'Djamena	0.099002	0.099079		0.21169	0.2142	0.1444	0.09560
Niamey	0.07014	0.071261		0.19777	0.1767	0.04139	0.06608
Roberts	0.019510	0.019516		0.02175	0.01983	0.03652	0.03557
Seychelles	0.014568	0.014830		0.01814	0.01312	0.01123	0.01928
Windhoek	0.011423	0.012615		0.01950	0.01859	0.01867	0.01316

Fig. 14

6.2.9 The TAG reiterated the need for all FIRs must submit RVSM safety data for the assessment every month to improve the distribution of the assessment area and therefore urged all States/FIRs to submit all the RVSM data from 2016 to 2018 as soon as practically possible to be included in the next Collision Risk Assessment.

FIR/UIR	No of months processed	Flight time estimate for 2016 (hrs)
Accra	11	33,798.96
Addis Ababa	-	
Algiers	11	142,441.87
Antananarivo	12	20,181.32
Asmara	-	
Beira	12	30,759.35
Brazzaville*	(6+7+4) *12 / 36 = 5.7	30,408.80
Cape Town	8	20,057.55
Dakar*	(3+12+12+0) * 12 / 48 = 6.8	67,053.77
Dar Es Salaam	-	
Entebbe	-	
Gaborone	-	
Harare	10	16,760.46
Johannesburg	10	74,102.82
Johannesburg Oceanic	-	
Kano	12	15,658.12
Kinshasa	5	34,694.28
Lilongwe	-	
Lomé	12	5,475.10
Luanda	-	
Lusaka	9	11,115.84
Mauritius	11	14,358.42
Mogadishu	8	73,007.67
Nairobi	5	77,585.40
N'Djamena	7	39,064.26
Niamey*	(11+12) * 12 / 24=11.5	52,483.15
Roberts	11	7,772.22
Seychelles	10	20593.08
Windhoek	12	16,020.93
Total	**209.9**	**803,393.37**

Fig 15

6.2.10 The agreed TAG to assist ARMA to:

a) encourage AFI States in the implementation of Strategic Lateral Offset Operations (SLOP);
b) urge the appropriate APIRG structures to review the AFI route network; and
c) assist, if possible, those FIRs mentioned in the paper to submit RVSM air traffic flow data.

6.3 Implementation of Strategic Lateral Offset Procedure (SLOP) in the AFI Region

6.3.1 SLOP reduces the risk of aircraft passing directly over each other and was identified in the synopsis of the Mid Air collision which occurred involving a B738 and HS125, as a procedure that can prevent such incidents from happening in the AFI region.

6.3.2 States were requested via State Letter Ref. ES AN 4/45 – 945 to respond not later than 28 February 2013 as to the status of SLOP implementation within their FIRs. A review conducted by ARMA in order to establish the number of FIR's that have officially published and implemented the procedure indicated only 50% of the AFI States have implemented to date. The result of SLOP implementation in the AFI region is required for use in the annual RVSM Collision Risk Assessment.

6.3.3 The TAG meeting recalled that the under mentioned Conclusion which was adopted by APIRG 17 was a contributing factor to non-implementation of SLOP by some AFI States:

CONCLUSION 17/43: IMPLEMENTATION OF STRATEGIC LATERAL OFFSETS (SLOP) IN THE AFI REGION

That, AFI States implement SLOP within their areas of responsibility, by the AIRAC effective date of 30th November 2010, in line with provisions in PANS-ATM Doc 4444 Chapter 16 and the following guidance:

a) SLOP will be applied in those oceanic FIRs where fixed routes are established;

b) SLOP will be applied in all areas of the continental AFI Region except in those areas where ATC separation is provided by surveillance, unless approved by the State; and

c) SLOP will be applied in oceanic random routing areas (AORRA and IORRA) with effect from the target date of AIRAC date of 2 June 2011

6.3.4 Most States/FIRs which have not as yet implemented SLOP quoted **APIRG CONCLUSION 17/43 (b)** as above as their reason and basis for non-implementation.

6.3.5 The ARMA has a requirement to establish the number of AFI FIRs in which SLOP has been implemented, pursuant to the above mentioned APIRG Conclusion. The primary objective of collecting the information on implementation is to use the data in the AFI RVSM Collision Risk Assessments. In addition, the information will be used to assess the AFI States' status of implementation of the APIRG Conclusions. The results of the survey conducted by ARMA are reflected hereunder:

FIR	Implemented SLOP (Yes/No)	Evidence Received (Yes/No)
Accra	Yes	Yes
Addis Ababa	No	
Algiers	No	Yes
Antananarivo	Yes	Yes
Asmara	No	
Beira	Yes	Yes
Brazzaville	Yes	Yes
Cape Town	No	Yes
Dakar (Terrestrial)	Yes	Yes
Dar Es Salaam	No	
Entebbe	No	
Gaborone	No	
Harare	Yes	Yes
Johannesburg	No	Yes
Johannesburg Oceanic	No	Yes
Kano	Yes	Yes
Kinshasa	Yes	Yes
Lilongwe	No	
Luanda	Yes	Yes
Lusaka	No	
Mauritius	No	
Mogadishu	Yes	Yes
Nairobi	No	Yes
N'djamena	Yes	Yes
Niamey	Yes	Yes
Roberts	Yes	Yes
Seychelles	Yes	Yes
Windhoek	No	Yes

Fig 16

6.3.6 The TAG made an observation that all the States in the AFI Region which have not as yet implemented SLOP are States accredited to the ESAF office and recommended that the ARMA and ICAO should provide more education of SLOP to provide better clarification on ICAO provisions, applications, processes, benefits and delineation of roles and responsibilities of States, ANSPs and airspace users.

6.3.7 The TAG agreed with ARMA that **APIRG CONCLUSION 17/43 (b)** will have to be amended as it gave States the option to opt out of SLOP implementation in their respective FIRs. The Collision Risk Assessment study is an expensive task undertaken by ARMA and should be used to the full benefit of the region in improving our safety levels and meeting global standards and in the spirit of ICAO No Country Left Behind initiative.

6.3.8 The TAG was informed that the data required for next CRA had to be submitted by 31 May 2019. The TAG therefore recommended for proactive actions to be taken by all stakeholders in providing the requisite data before the 31 May 2019. In this regard, the TAG requested:

a) ICAO, ARMA and FAA to provide AFI States, with all documents and guidance materials relating to SLOP including sample AIP Supplement (AIP SUPP), by 11 May 2019;

b) States that have not as yet implemented SLOP to publish AIP SUPP for SLOP implementation by 25 April 2019 to take effect on 23 May 2019;

c) States to ensure that aircraft and pilots are approved for SLOP operations; and

d) ICAO to initiate the process and request APIRG to review **Conclusion 17/05 (b).**

6.9 Action Required:

a) ARMA is requested to compile the details of incidents of coordination failures and LHDs and submit to the ICAO ESAF Regional Office for coordination and onward transmission to the ICAO MID Office to address the unsatisfactory condition reports involving Sanaa and Asmara FIRs.

b) States/ANSPs which recorded high numbers of coordination failures be urged to investigate and identify Human Factors causes which lead to coordination failures, and take appropriate steps to address them, including awareness programmes to mitigate human error induced by coordination failures.

c) States/ANSPs be urged to report all vertical events involving large height deviations and take the necessary corrective action to reduce the total vertical risk further down to below the total vertical Target Level of Safety.

d) States/FIRs which have not yet done so are urged to submit all the RVSM data from 2018 to 2019 as soon as practically possible to be included in the next Collision Risk Assessment CRA 13, and establish a mechanism for submission of monthly data to ARMA.

e) AFI States are encouraged to implement Strategic Lateral Offset Operations (SLOP);

f) Secretariat to coordinate with States/ANSPs and Airspace Users to facilitate a review of the AFI route network;

g) ARMA and ICAO should provide more education of SLOP to provide better clarification on ICAO provisions, applications, processes, benefits and delineation of roles and responsibilities of States, ANSPs and airspace users;

h) ICAO to take the necessary action for amendment to APIRG CONCLUSION 17/43 (b) to provide better understanding and remove any ambiguity in the implementation of SLOP in airspaces where ATC separation is provided by surveillance; and

i) ICAO and ARMA should collaborate to provide RVSM post implementation awareness training to RVSM National Programme Managers or Focal Points.

Agenda Item 7: Review of TAG and Terms of Reference

7.1 The TAG reviewed and adopted new Terms of Reference, Work Programme and Standard Operating Procedures during its eighth meeting in 2015 as attached in **Appendix A** to this working paper.

7.2 The Group reviewed the status of implementation of the new TOR, work programme and SOP, updated and aligned the provisions in them to effectively address current and emerging challenges, and agreed on implementation processes to ensure that the objectives therein are fully achieved.

7.3 Action Required:

a) ICAO as the TAG secretariat and TAG members were entreated to ensure full operationalization of TOR, work programme and SOP;

b) ICAO was requested to ensure that the monthly TAG teleconferences resumes from April 2019;

c) States be requested to confirm/update the contact details of RVSM National Programme Managers or Focal Points; and

d) ICAO and ARMA to conduct seminars for State agencies and RVSM NPM/Focal Points to inform and/or update them on RVSM requirements and post implementation responsibilities of States, ANSPs and Airspace Users and other stakeholders.

Agenda Item 8: Any Other Business

8.1 Search and Rescue

8.1.1 Request was made if SAR could be included in the TAG work programme. The TAG was informed that the fifth edition of the GANP includes SAR. Furthermore, SAR was part of the AFI Air Navigation Performance Targets and included in the revised Abuja Safety Targets. The TAG was also briefed of ongoing SAR project coordinated by the AFI Plan and in collaboration with AFCAC, Regional Economic Commissions and some funding support from the African Development Bank. However, SAR does not form part of the current mandate of TAG.

8.2 Effective Communications

8.2.1 Senegal indicated that its communications to other States and organizations were not readily responded to and urged for prompt responses, noting, that some of the issues had safety implications.

9. Closing Remarks

Mr. Protus Seda OTIENO, Assistant Director, Safety and Flight Operations, ATM Africa & Middle East (AME) in his closing remarks entreated all to make the TAG work.