



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**REPORT OF THE FOURTH MEETING
OF THE RUNWAY AND GROUND SAFETY
WORKING GROUP**

(RGS WG/4)

(Cairo, Egypt, 05 – 07 November 2017)

The views expressed in this Report should be taken as those of the MID Region Runway and Ground Safety Working Group (RGS WG) and not of the Organization. This Report will, however, be submitted to the RASG-MID 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 Fourth meeting of the Runway and Ground Safety Working Group (RGS WG/4) was held at the ICAO Middle East Regional Office in Cairo, Egypt, from 5 to 7 November 2017.

2. OPENING

2.1 The meeting was opened by Mr. Mashhor Alblowi, Regional Officer, Flight Safety (RO/FLS), ICAO Middle East Regional Office, Cairo. Mr. Alblowi welcomed all the participants to Cairo and wished them a successful and fruitful meeting.

2.2 Mr. Alblowi commended the achievement made by the RGS WG over the past years and highlighted the need to review and update the MID Region Safety Strategy and Safety targets, as deemed necessary, and for in-depth analysis of accidents and incidents related to RGS.

2.3 Mr. Alblowi emphasized that States and stakeholders called for sharing experience and best practices in order to provide recommended actions related to the implementation of the Safety Enhancement Initiatives (SEIs). He also reiterated that the NCLB Initiative and the Runway Safety Go-Team are effective tools to share experience and invited the MID States to benefit from those programmes and request NCLB and Go-Team Visits to enhance runway safety and safety of aerodrome operations.

2.4 In closing, Mr. Alblowi thanked the participants for their attendance and wished the meeting every success in its deliberations.

3. ATTENDANCE

3.1 The meeting was attended by a total of thirty-five (35) participants from nine (9) States (Bahrain, Egypt, Iran, Kuwait, Lebanon, Saudi Arabia, Sudan, UAE and USA). The list of participants is at **Attachment A**.

4. OFFICERS AND SECRETARIAT

4.1 The meeting was chaired by Mr. Mohammad Faisal Al Dossari, Director Air Navigation & Aerodromes Department, General Civil Aviation Authority, UAE.

4.2 Mrs. Nawal Abdel Hady, ICAO MID Aerodromes and Ground Aids (AGA) Expert was the Secretary of 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 and Election of the Chairperson

Agenda Item 2: Global and Regional Development related to RGS

Agenda Item 3:	Implementation of Aerodrome Safety priorities and objectives in the MID Region
Agenda Item 4:	Coordination between RASG-MID and MIDANPIRG in the area of Aerodromes
Agenda Item 5:	AOP Air Navigation Deficiencies
Agenda Item 6:	Future Work Programme
Agenda Item 7:	Any other business

7. CONCLUSIONS AND DECISIONS – DEFINITION

7.1 All RASG-MID Sub-Groups and Task Forces record their 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 and its stakeholders/partners, 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 subsidiary bodies.

8. LIST OF DRAFT CONCLUSIONS AND DRAFT DECISIONS

<i>DRAFT CONCLUSION 4/1:</i>	<i>SURVEY ON ARFF / AEP LEVEL OF IMPLEMENTATION</i>
<i>DRAFT CONCLUSION 4/2:</i>	<i>WILDLIFE HAZARDS MANAGEMENT AND CONTROL (WHMC) PLAN TEMPLATE</i>
<i>DRAFT CONCLUSION 4/3:</i>	<i>AERODROME APRON MANAGEMENT SAFETY AND GROUND HANDLING SERVICES</i>
<i>DRAFT CONCLUSION 4/4:</i>	<i>AERODROME SMS COMPLIANCE AND EFFECTIVENESS TOOL KIT AND AERODROME SMS TRAINING/ WORKSHOP</i>
<i>DRAFT CONCLUSION 4/5:</i>	<i>FURTHER SAFETY ENHANCEMENTS RELATED TO RUNWAY EXCURSIONS</i>
<i>DRAFT CONCLUSION 4/6:</i>	<i>AIRPORT MASTER PLAN</i>

PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA AND ELECTION OF CHAIRPERSON

1.1 The meeting reviewed and adopted the Agenda as at paragraph 6.1 of the History of the Meeting.

1.2 The meeting unanimously agreed to re-elect Mr. Mohammad Faisal Al Dossari, Director Air Navigation and Aerodromes Department, GCAA, UAE as the Chairperson of the RGS WG for the next three meetings.

1.3 The meeting unanimously elected Eng. Angie Ahmed Abd Alla Mostafa, Head of Aerodromes Safety and Standards Administration, Egyptian Civil Aviation Authority as the Vice-Chairperson of the RGS WG.

REPORT ON AGENDA ITEM 2: GLOBAL AND REGIONAL DEVELOPMENT RELATED TO RGS***Outcome of RASG-MID/6***

2.1 The meeting noted the outcome of RASG-MID/6 meeting (Bahrain, 26 – 28 September 2017) and recalled that RASG-MID/6 developed number of Conclusions and Decisions related to RGS as listed at **Appendix 2A**. The meeting noted the follow up actions on Decisions 6/12 and 6/13.

Initiatives to Promote Safe and Efficient Apron Management

2.2 The subject was addressed in WP/3 presented by UAE. The meeting noted with appreciation the Aerodrome Regulator's best practices on Airside Safety Management in UAE including Apron Management, Ground Handling Services and Airside Drivers.

2.3 The meeting noted the work developed by UAE and recognized that similar guidance material should be part of the Detailed Implementation Plan (DIP) for the Safety Enhancement Initiative MID-RAST/RGS/7.

MID Region NCLB Strategy/Plan Related to RGS

2.4 The subject was addressed in WP/4 presented by the Secretariat. The meeting was briefed on the development of the ICAO NCLB Initiative and its objectives on providing enhanced support for States in the effective implementation of ICAO's SARPs, plans and policies in a more coordinated, comprehensive and globally harmonized manner and promoting the resolution of Significant Safety Concerns (SSCs) and Significant Security Concerns (SSeCs), if any.

2.5 The meeting noted that the Muscat Declaration and the MID NCLB Strategy were endorsed by the DGCA-MID/4 meeting (Muscat, Oman, 17 - 19 October 2017). The strategy calls States and stakeholders to coordinate with the ICAO MID Office the provision of required assistance in support to the MID NCLB activities in order to foster the achievement of the regional safety targets that include:

- Regional average EI to be above 70% by 2020; and
- 11 States to have at least 60% EI by 2020.

2.6 The meeting urged States to:

- a) coordinate with the ICAO MID Office the development/finalization of their NCLB Plan of Actions;
- b) coordinate with the ICAO MID Office for the provision of required assistance related to RGS, in support to the MID NCLB Strategy; and
- c) provide voluntary contributions to support the MID NCLB plan/activities related to RGS.

2.7 The meeting reviewed the MID NCLB plan related to RGS and agreed to the followings for the year 2018:

- volunteered States to support the NCLB: UAE, Saudi Arabia and Egypt;
- potential States for NCLB activities: Egypt, Iran, Iraq, Jordan, Lebanon and Sudan; and
- type of activities:
 - visits to support 100% implementation of Certification of Aerodromes, SMS Runway Safety Programmes;
 - support enhancement of EI% in the aerodrome area; and
 - training workshops for aerodrome regulator and aerodrome operators on one or more areas related to RGS such as ARFF, monitoring and reporting runway surface conditions, certification of joint civil-military aerodromes, and safety management for aerodromes operations, modular exams for aerodrome emergency planning.

2.8 The meeting agreed that some areas are considered part of the challenges faced during certification of aerodromes such as ARFF and Emergency Planning at Aerodromes. The meeting agreed that a questionnaire on the level of implementation of ARFF in the MID aerodromes should be developed. A group of experts from Egypt (Champion), UAE and Saudi Arabia volunteered to support the NCLB activities and MID Office on formulating a questionnaire in three-month time for circulation to MID States. The results will be presented to the next RGS WG/5 meeting for further course of actions.

2.9 Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/1: SURVEY ON ARFF/AEP LEVEL OF IMPLEMENTATION

That,

- a) a survey on ARFF/AEP level of implementation be carried out based on the Questionnaire to be developed by 15 February 2018; and*
- b) the results of the survey be presented to the RGS WG/5 meeting for further course of actions.*

2.10 The meeting encouraged and urged potential candidate States to coordinate with the ICAO MID Office their needs related to NCLB activities (Type and tentative dates) not later than 15 January 2018.

Outcomes of The NCLB Aerodrome Certification Workshop/Training

2.11 The subject was addressed in WP/5 presented by the Secretariat. The meeting noted that the ICAO MID Office has successfully conducted the NCLB Workshop on Certification of Aerodromes, graciously supported technically by Egypt and UAE, in Cairo, Egypt, from 1 to 5 October 2017. The Workshop highlighted the challenges and opportunities in the certification processes and provided a forum for sharing experiences and best practices related to the Certification of Aerodromes in the MID Region. The NCLB Workshop Work Programme and outcomes are available at the ICAO MID Regional Office website: <https://www.icao.int/MID/Pages/Meetings/meetings2017.aspx> .

2.12 The outcomes of the NCLB Workshop on Certification of Aerodromes included the following recommendations:

- States and Stakeholders to consider competencies and building capacity of both regulators and aerodrome operators as milestones for the effective implementation of aerodrome certification and aerodrome continued safety oversight and request assistance from ICAO MID Regional Office, if needed.
- ICAO to consider developing more guidance material on:
 - Aerodrome Data Management; and
 - Ground Handling Services and Apron Management.
- States to consider development of clearly defined roles and responsibilities of regulators and aerodrome operators, for resolving aerodrome safety concerns.

REPORT ON AGENDA ITEM 3: IMPLEMENTATION OF AERODROME SAFETY PRIORITIES AND OBJECTIVES IN THE MID REGION

Update on Development and Implementation of SEIs & DIPs related to RGS

3.1 The subject was addressed in WP/6 presented by the RGS WG Chairperson, and WP/13 presented by Sudan and Egypt. The meeting recalled that MID-RAST/RGS/1 is addressed under the CFIT DIPs and that the SEI related to Safety Management System (SMS) has been transferred to Safety Support Team (SST).

MID-RAST/RGS/2

3.2 The meeting noted with appreciation that the DIP actions have been fully completed. It was recalled that the MID-RAST/RGS/2 focuses on the development of guidance material and training programmes to support the creation of action Plans by the Runway Safety Team (RST) and that UAE is the Champion of this SEI. A Summary of Actions related to the MID-RAST/RGS/2 DIP is at **Appendix 3A**.

MID-RAST/RGS/3

3.3 The MID-RAST/RGS/3 focuses on the development of guidance material and training programmes to support Aerodrome Infrastructure and Maintenance Management. It was noted with appreciation that UAE, the Champion of this SEI, has completed four (4) out of the five (5) required actions of this DIP.

3.4 A Summary of Actions related to the MID-RAST/RGS/3 DIP is at **Appendix 3B**.

3.5 The meeting appraised the information presented by Egypt under WP/12 on the subject of Maintaining Operational Safety Level on Aerodromes during construction.

3.6 The meeting was of the view to consider the information contained at **Appendix 3C** on the preparation of the last part of the DIP on Safety Enhancement Initiative (MID-RAST/RGS/3) related to the development of guidance material and training programmes to support Aerodrome Infrastructure and Maintenance Management

MID-RAST/RGS/4

3.7 The MID-RAST/RGS/4 focuses on Aerodrome Safeguarding. Egypt is the Champion of this DIP with the support of UAE and Sudan. A Summary of Actions related to the MID-RAST/RGS/4 DIP is at **Appendix 3D**.

3.8 The meeting noted that the RASG-MID Safety Advisory (RSA) on Aerodrome Safeguarding was endorsed by the RSC/5 meeting in January 2017 and was circulated to all MID States in March 2017. The meeting appreciated the work achieved by the Aerodrome Safeguarding Team composed of Eng. Angie Mostafa and Mrs. Sahar Mostafa from Egypt with the support of Mr. Mohamed Yousif from UAE and Mr. Fakhreldin Osman from Sudan.

3.9 The meeting recommended that the Aerodrome Safeguarding Toolkit as at **Appendix 3E**, previously reviewed by the RGS WG/3 meeting; be circulated to All MID States as an attachment to the RSA-11 on Aerodrome Safeguarding.

3.10 As part of the RGS/4 DIP, Egypt reconfirmed the hosting of the Aerodrome Safeguarding Workshop in Cairo from 4 to 6 December 2017. All MID States are encouraged to actively participate in this Workshop.

MID-RAST/RGS/5

3.11 The MID-RAST/RGS/5 focuses on Wildlife Management and Controls. Sudan is the Champion of this DIP supported by Bahrain, Egypt, Oman and UAE. A Summary of the Planned Actions related to the MID-RAST/RGS/5 DIP is at **Appendix 3F**.

3.12 The meeting noted that the RASG-MID Safety Advisory (RSA) on Wildlife Hazards Management and Control was endorsed by the RASG-MID/6 meeting in September 2017 and was circulated to all MID States on 23 October 2017. The meeting appreciated the work achieved by the MID-RAST/RGS/5 Team composed of Mr. Fakhreldin Osman from Sudan, Eng. Ahmed Arafa from Egypt, Mr. Mohamed Yousif from UAE and Dr. Waleed Elsagheer from Egypt.

3.13 As part of the MID-RAST/RGS/5 DIP; the meeting reviewed the WHMC Plan Template Plan as at **Appendix 3G** and recommended its circulation to MID States for their comments before endorsement. The WHMC Plan Template considered as an attachment to RSA-13.

3.14 The meeting agreed that coordination should take place with RASG Steering Committee to expedite the endorsement of the Wildlife Hazard Management and Control Template and to be issued as an Appendix to the existing Circular prior to June 2018.

3.15 Accordingly; the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/2: WILDLIFE HAZARDS MANAGEMENT AND CONTROL (WHMC) PLAN TEMPLATE

That, the WHMC Plan Template be included as an Appendix to the RASG-MID Safety Advisory (RSA) on Wildlife Hazards Management and Control.

3.16 As part of the MID-RAST/RGS/5 DIP, Sudan offered to host the Wildlife Management Workshop during from 26 to 28 September 2018. All MID States are encouraged to promote attendance to this Workshop.

MID-RAST/RGS/6

3.17 The MID-RAST/RGS/6 focuses on Laser Attacks. Egypt is the Champion of this DIP supported by Bahrain, Sudan and UAE. A Summary of the Actions related to the MID-RAST/RGS/6 DIP is at **Appendix 3H**.

3.18 The meeting noted that RASG-MID Safety Advisory (RSA) on Laser Attacks was endorsed by the RSC/5 meeting in January 2017 and was circulated to All MID States on 29 March 2017. The meeting appreciated the work achieved by the MID-RAST/RGS/6 Team composed of Eng. Mahmoud Sharaf, Mr. Mohamed Mostafa from Egypt, Mr. Mohamed Yousif from UAE and Mr. Salah Alhumood from Bahrain.

3.19 The meeting recommended that the Laser Attack Safety Case-Study at **Appendix 3I**, previously reviewed and endorsed by the RGS WG/3 and RSC/5 meetings be circulated to all MID States as an attachment to the RSA-12. Circulating the case study will conclude the successful completion of the MID-RAST/RGS/6 DIP.

MID-RAST/RGS/7

3.20 The MID-RAST/RGS/7 focuses on Safety topics related to Ground Handling Services at the Aerodromes. IATA is the Champion of this DIP. IATA apologized prior to the meeting to come up with a detailed action plan due to other commitments.

3.21 In support of the RASG-MID/6 Conclusion 6/7 on Expansion of the Runway Safety Programme Scope to include Apron; the meeting was of the view to develop a draft DIP as at **Appendix 3J** with the following implementation actions:

- Prepare an Advisory Circular on Apron Management Safety, UAE is the lead supported by Egypt and Saudi Arabia by Q3-2018. (Ms. Michelle Helen Soliman from UAE, Mr. Ahmed Arafa from Egypt and Mr. Ali Adayab from Saudi Arabia)
- A Seminar/Training on “Ground Handling Safety” to be hosted by UAE during the First Quarter of 2019 supported by ICAO, IATA and Ground Handlers.

3.22 Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/3: AERODROME APRON MANAGEMENT SAFETY AND GROUND HANDLING SERVICES

That,

- a. an Advisory Circular be developed on Aerodrome Apron Management Safety; and*
- b. a Seminar on Ground Handling Safety be organized and hosted by UAE and supported by ICAO, IATA and Ground Handlers in the First Quarter of 2019.*

Aerodrome Certification

3.23 The subject was addressed in WP/7 presented by the Secretariat. The meeting reviewed the updated status of Aerodrome Certification in the MID Region as at **Appendix 3K**. It was highlighted that 34 out of 59 International Aerodromes (representing 58%) had been certified in the MID Region. Jordan certified Queen Alia International Airport on 11 December 2016. The meeting also noted that Iran has certified Yazd International Airport (OIYY).

3.24 The meeting noted that Saudi Arabia completed the certification of Taief Airport (not listed in the eANP-AOP Table). In addition, Egypt has certified Aswan International Airport (HESN) as of 29 January 2017, Egypt confirmed that Luxor International Airport (HELX) is in its final stage of certification (certification expected before the end of 2017) and Borg El Arab Intl Airport is planned for certification before the First Half of 2018.

3.25 The meeting noted that the AOP Table of the MID ANP has been amended based on requests from Egypt, Iran and Sudan and now includes 59 International Aerodromes. It was highlighted that States need to notify the air carriers and aerodrome users of any change to aerodrome category or type of use.

3.26 The meeting noted that the RSC/5 meeting reviewed the status of implementation of Aerodrome Certification and agreed that more efforts are needed to meet the target of 75% for year 2017. The meeting was of the view that, considering the political conflict and security situation in Libya, Syria and Yemen the safety target for the end of year 2017 wouldn't be met, and called for more efforts in this regard.

Establishment of Runway Safety Teams in the MID Region

3.27 The subject was addressed in WP/10 presented by the Secretariat. The meeting was briefed on the status of establishment of Runway Safety Teams at International Aerodrome as contained at **Appendix 3L**.

3.28 The meeting noted with appreciation that the percentage of RST establishment reached 56 % (the MID Safety Strategy target is 50% by 2020).

3.29 The meeting reiterated that States should take necessary actions to ensure establishment of RST at international aerodromes and request RS Go-Team visit, as required.

Status of Implementation of Aerodrome Safety Management System in the MID Region

3.30 The subject was addressed in WP/14 presented by the Secretariat. The meeting updated the information related to the implementation of SMS at MID International Aerodromes, as at **Appendix 3M**. The meeting highlighted that having in place an SMS at an aerodrome is different than monitoring its effectiveness. Lack of training and insufficient number of skilled personnel were identified as the main challenges for monitoring the implementation of an effective SMS at aerodromes.

3.31 The meeting encouraged States to request NCLB activities (visit, training workshop, for a State or for group of States) in addition to RS Go-Teams as appropriate.

3.32 The meeting recognized the challenges in monitoring implementation, compliance and effectiveness of aerodrome safety management system in the MID Region. The meeting agreed that an Aerodrome Customized SMS Course and Workshop should be conducted back to back with the next RGS WG meeting with technical support provided by experts from Egypt and UAE. The meeting was of the view that developing an example of an aerodrome SMS toolkit would be an effective tool to be used by both aerodrome operators and aerodrome regulators for the implementation and monitoring the effectiveness of SMS at aerodromes guided by ICAO relevant guidance material and States best practices. A group of experts volunteered to develop the SMS Tool-Kit; Mr. Mohamed Yousif from UAE will lead the group supported by Mr. Mahmoud Fekry from Egypt, and Saudi Arabia. The draft Tool-kit will be presented at the Aerodrome SMS Training Workshop planned to be held back-to-back with the RGS WG/5 meeting. Accordingly; the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/4: AERODROME SMS COMPLIANCE AND EFFECTIVENESS TOOL KIT AND AERODROME SMS TRAINING / WORKSHOP

That,

- a) an aerodrome SMS Training/Workshop be organized by ICAO back-to-back with the next RGS WG/5 meeting with the technical support of Egypt and UAE; and*
- b) sample Aerodrome SMS Compliance and Effectiveness Tool-Kit be developed and presented at the Aerodrome SMS Training/Workshop.*

Review and Update of the MID Region Safety Strategy Targets related to RGS

3.33 The subject was addressed in WP/8 presented by the Secretariat. The meeting reviewed the MID Region Safety Indicators status and Safety Targets related to RGS as detailed at **Appendix 3N**.

3.34 The meeting noted that the identified Runway Safety Targets and Indicators are:

- Reduce/maintain the regional average rate of Runway Safety related accidents to be below the global average rate by 2016 (MID Average rate is 1.39 and the global average rate is 1.48).
- Reduce/maintain the Runway Safety related accidents to be less than 1 accident per million departures by 2016 (MID is 1.54).

Runway Safety Priorities and Analysis in the MID Region and MID Annual Safety Report (ASR)

3.35 The subject was addressed in WP/9 presented by the Secretariat. The meeting noted that eight (8) accidents related to Runway Safety were reported during the period 2012 to 2016 out of 16 (sixteen) reported accidents during the same period as listed at **Appendix 3O**. The meeting noted that there is lack of information related to root causes of the reported accidents related to Runway Safety. The meeting was of the view that in-depth analysis could not be carried out without the collection of reliable accident and serious incidents data.

3.36 The meeting noted that RASG-MID/6 reviewed the preliminary results of the Sixth MID-ASR (September 2017). Based on the analysis of the reactive safety information for the period 2012-2016, and in accordance with the agreed matrix used for the assessment of the different accident categories (frequency x severity), the followings were identified as the Focus Areas for the MID Region:

1. Runway Safety (RS); and
2. System Component Failure.

3.37 The meeting noted that neither Controlled Flight Into-Terrain (CFIT) nor Loss of Control In-Flight (LOC-I) related accidents occurred in the MID Region during the period 2012-2016.

3.38 With respect to the proactive safety information, the meeting noted the following:

- The average Regional USOAP EI score is 70.5% which is above the world average of 64.71%;
- 76.92% of the MID States have achieved the target of 60% EI (10 States); and 3 State have EI below 60%; and
- No SSC is registered in the MID Region.

3.39 The meeting noted the 5th MID Annual Safety Report Review presented by Egypt in PPT1 and recalled that, based on the analysis of the accident data for the period (2011-2015), the main Focus Areas in the MID Region were:

- 1- Runway Safety (RS);
- 2- Loss of Control In-Flight (LOC-I); and
- 3- System Component Failure (SCF).

3.40 The meeting recognized that Runway Excursion contributing factors include: Airport facilities, Metrology, Poor/Faint markings/signs or runway/taxiway closure, Aircraft malfunction, Contained engine failure/power plant malfunction, Errors related to Manual Handling/ Flight controls, Errors related to ground navigation, Errors related to SOP adherence/ SOP cross verification, Continued landing after unstable approach, Long/floated/bounced/firm/off-centre/crabbed landing, Unstable approach, Overall crew performance and Runway/taxiway management.

3.41 The meeting was of the view that Runway contamination is one of the threats and errors involved in Runway Excursion accidents and recommended action as detailed at Para. 3.46, 3.47 & 3.48.

3.42 The meeting highlighted the importance of accident and incidents reporting and implementing RASG-MID/6 Conclusion 6/10 that urged States to comply with Annex 13 provisions related to the release of Final Reports on accidents and serious incidents; and send copy of the Final Report for the accidents and serious incidents involving aircraft of a maximum mass over 5700 kg to ICAO HQ and MID Regional Office. In addition, RASG-MID/6 recommended that records of Runway Safety related accidents, with contributing factors, should be submitted to ICAO MID Regional Office by end of each calendar year.

3.43 With respect to the review/analysis of accidents data, the meeting recognized that RASG-MID/6 agreed that the focus should be on the accidents related to the RS and SCF Focus Areas and that the MID-ASRT should include this in its work programme in order to identify the root causes and contributing factors, as well as the associated safety recommendations.

3.44 In addition; the meeting urged States to send data related to Incidents Reports related to the following areas to the ICAO MID Office in conjunction with the MID ASRT:

- Runway Excursions
- Runway Incursions
- Taxiway Incursions
- Wildlife/Bird strikes
- FOD – Reported over Runways
- Aircraft Ground damages

3.45 The meeting recognized and appraised the work done by Eng. Atef Barakat, Mr. Ahmed Helmy and Mr. Mohamed Mostafa from Egypt who reviewed the 5th MID ASR runway safety issues and made some additional analyses. The meeting agreed that the same group should continue carrying out the same review prior to every RGS WG meeting.

Runway Excursions

3.46 The Subject was addressed in WP/11 presented by Egypt. The meeting noted the information presented by Egypt and agreed to set of proposed useful mitigations that should be taken into consideration for both preventive control and recovery measures.

3.47 The meeting supported the views that runway surface condition reporting system, in terms of quality and timing must therefore be consistent with the aircraft operational performance. Also the provision of adequate visual reference during the final stage of approach, combined with low visibility operations are critical to reduce the risk of runway excursion.

3.48 The meeting supported the need for Advisory Circular of best practices on Monitoring and Reporting Runway Surface Conditions at aerodromes. Group of States volunteered to develop an Advisory Circular, FAA would be the Champion supported by Egypt and UAE, a Draft Circular will be reviewed by June 2018.

3.49 Accordingly, the meeting formulated the following Draft Conclusion:

DRAFT CONCLUSION 4/5: FURTHER SAFETY ENHANCEMENTS RELATED TO RUNWAY EXCURSIONS

That:

- a) *an Advisory Circular on Monitoring and Reporting of Runway Surface Condition, be developed and reviewed before endorsement and circulation to States; and*
- b) *States be urged to report the following incidents on Annual Basis to the ICAO MID Office in conjunction with MID-ASRT.*
 - *Runway Excursions*
 - *Runway Incursions*
 - *Taxiway Incursions*
 - *Wildlife/Bird strikes*
 - *FOD – Reported over Runways*

Follow-up and feedback on implementation of RSAs related to RGS

3.50 The meeting noted that RASG-MID issued so far thirteen (13) RASG-MID Safety Advisories (RSAs), as part of the Safety Enhancement Initiatives (SEIs), out of them five (5) are developed by the RGS WG.

3.51 The meeting recalled that RASG-MID/6 meeting recognized the need to monitor the implementation of the RASG-MID Safety Advisories in the MID Region and tasked the different RASG-MID subsidiary bodies to follow-up with States and stakeholders the implementation of the issued RSAs.

3.52 Egypt, Sudan and UAE confirmed using the RSAs which are found helpful in Aerodrome Certification, RST establishment and safety oversight.

3.53 The meeting recalled the need to promote the RSAs and agreed to the following initiatives:

- a. Preparation of Questionnaire on States feedback on the RSAs' implementation. Champion: Eng. Angie, Egypt (By end of January 2018).
- b. Preparation of Power Point Presentation on RASG-MID' RSAs to be delivered to regional aviation events related to Aerodromes to promote and expedite their implementation. Champion: Mr. Ahmed Helmy, Egypt. Target date: February 2018.
- c. Promotion on ICAO MID website (ICAO MID Regional Office).
- d. Preparation of USB Tool-Kit including RSAs (to be sponsored by stakeholders).
- e. Promotion Brochures. Champion : Ms. Michelle Soliman, UAE. Target Date : February 2018.

REPORT ON AGENDA ITEM 4: COORDINATION BETWEEN RASG-MID AND MIDANPIRG IN THE AREA OF AERODROME SAFETY

ASBU Implementation

4.1 The subject was addressed in WP/15 and WP/16 presented by the Secretariat. The meeting recalled that ASBU Modules B0-SURF and B0-ACDM, which have been identified by the MID Region Air Navigation Strategy as priority one, are directly related to aerodrome operations and need to be coordinated and reviewed by the RGS WG.

4.2 The meeting noted the information related to sub-elements of both B0-A-CDM and B0-SURF and was of the view to consider the main elements contained in the current MID eANP Volume III, until further discussion by ANSIG.

B0-SURF

4.3 The meeting recalled that B0-SURF aims at enhancing safety and efficiency of surface operations through implementation of Advanced Surface Movement Guidance and Control System (A-SMGCS Level 1-2). In this respect, it was highlighted that Basic A-SMGCS provides surveillance and alerting of movements of both aircraft and vehicles on the aerodrome thus improving runway/aerodrome safety.

4.4 The Advanced Surface Movement Guidance and Control Systems (A-SMGCS) is an expansion of the Surface Movement Guidance and Control Systems (SMGCS) to improve capacity and safety by making use of modern technologies and a higher level of integration between the various functionalities.

4.5 A-SMGCS Levels 1-2 related to B0-SURF are to be implemented by a number of agreed international airports as included in the MID Region Air Navigation Strategy. Name of the applicable airports and implementation Performance Indicators/Supporting Metrics and Targets are included in Volume III of the MID eANP.

B0-ACDM

4.6 The meeting recalled that B0-ACDM aims at Improved Airport Operation through Airport Collaborative Decision Making (A-CDM). It was highlighted that A-CDM implementation will enhance surface operations and safety by making airspace users, ATC and airport operators better aware of their respective situation and actions on a given flight.

4.7 The Work Programme and the presentations delivered during the Seminar are available at the ICAO MID Regional Office website: <http://www.icao.int/MID/Pages/2015/A-CDM%20Seminar.aspx>.

4.8 The meeting recalled the MSG/5 Draft Conclusion 5/1 that urged States to develop their action plan for A-CDM implementation in line with the MID Air Navigation Strategy.

4.9 UAE was of the view that A-CDM is required for 2 International Aerodromes only in UAE and requested removal of the third Aerodrome DUBAI/Al Maktoum (OMDW) from the applicable airports list.

4.10 The meeting reviewed the agreed targets and updated the status of implementation of both ASBU Modules B0-ACDM and B0-A-SURF, as reflected at **Appendices 4A and 4B**, respectively.

4.11 The meeting highlighted that B0-ACDM implementation progress is below expectation and some States requested additional training and Workshop to have a better understanding and support implementation at airports.

Helideck/Offshore Aerodrome Regulatory Framework

4.12 The subject was presented in WP/17 presented by UAE. The meeting noted the information shared by UAE on regulatory framework that has been implemented to support the safety oversight of helicopter landing areas on fixed or floating off-shore facilities used for mineral exploitation (for the exploration of oil and gas), research or construction, limited to the UAE and within UAE territorial waters.

4.13 The regulatory framework was adopted in partnership with the aviation industry in the UAE. This approach has gained the support of stakeholders; it illustrates commitment to the promotion of a safe aviation infrastructure and to the principles of the UAE's State Safety Programme.

4.14 The meeting was of the view that MID States are encouraged to adopt a regulatory approach guided by UAE best practices for their Helideck/Offshore aerodromes.

Heliport

4.15 The meeting recalled that MIDANPIRG/16 agreed on Conclusion 16/9 - *Establishment of Heliports database*.

4.16 As a follow up to the MIDANPIRG Conclusion 16/9, information was received from three (3) States (Bahrain, Jordan and Oman). Jordan and Oman has no civil Heliports hence; requirement is not applicable to both of them. Bahrain has confirmed establishment of a Heliport Database, as required.

Increase of Aerodrome Capacity Associated with Increased Airspace Capacity

4.17 The subject was addressed in WP/18 presented by the Secretariat. The meeting was of the view that increasing of Airport Capacity associated with the increase of Airspace Capacity mandate the need for a coordinated phased Airport Master Plan and recognized the importance of a systematic and consultative approach for long-term development of an airport expansions thereby enhancing safety and efficiency of aircraft operations while increasing capacity.

4.18 The meeting recalled that ICAO Global and MID Air Navigation Plans, present States with a comprehensive planning tool supporting a harmonized global Air Navigation System and that the GANP's Block Upgrade planning approach addresses user needs, regulatory requirements and the needs of Air Navigation Service Providers and Airports.

4.19 The meeting recalled that Annex 14 Volume I, does not include specifications relating to the overall planning of aerodromes such as separation between adjacent aerodromes or capacity of individual aerodromes or to economic and other non-technical factors that need to be considered in the development of an aerodrome, and that general information on those subjects is included in the 2nd Edition, 1987 of the Airport Planning Manual (Doc 9184), Part 1, and that the Manual on Certification of Aerodrome Doc 9774 required the aerodrome manual to include a plan of the aerodrome showing the main aerodrome facilities for the operation of the aerodrome.

4.20 Egypt, Kuwait, Sudan and UAE strongly supported the need for a requirement for Airport Master Plan to be developed for each international aerodrome. The meeting encouraged States CAAs and Airport Operators to develop long term Airport Master Plans that provides for an explicit, traceable and transparent method of decision-making at all levels of the organization to have all the required information readily available to make the right decision at the right time following consultative and systems engineering approach.

4.21 The meeting was of the view that, as a first step, States are encouraged to incorporate provisions in their national regulations to require the development of Airport Master Plan.

4.22 Accordingly; the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 4/6: AIRPORT MASTER PLAN

That, ICAO, to consider:

- a) review, and if necessary develop SARPs on airport master planning requirements for all aerodrome open for Public use to support airport capacity enhancements; and*
- b) update and amend, as appropriate, the guidance material contained at the Airport Planning Manual Doc 9184 - Part 1.*

That, States, are encouraged to:

- a) require their aerodrome operators to have in place an Airport Master Plan for all international airports as a first step; and*
 - b) provide information to the ICAO MID Office on the status of implementation of airport master plan, as required.*
-

REPORT ON AGENDA ITEM 5: AOP AIR NAVIGATION DEFICIENCIES***Review of the AOP Air Navigation Deficiencies***

5.1 The subject was addressed in WP/19 presented by the Secretariat. The meeting recalled that MIDANPIRG/16 (Kuwait, 13 - 16 February 2017) re-iterated Conclusion 15/35 of MIDANPIRG/15 on Air Navigation Deficiencies that urge States to:

- a. use the MID Air Navigation Deficiency Database (MANDDD) for the submission of requests for addition, update, and elimination of Air Navigation Deficiencies, including the submission of a specific Corrective Action Plan (CAP) for each deficiency; and
- b. submit a Formal Letter to the ICAO MID Regional Office containing the evidence(s) that mitigation measures have been implemented for the elimination of deficiency(ies) when requesting the elimination of deficiency(ies) from the MANDDD.

5.2 The meeting agreed that the identification and reporting of Air Navigation Deficiencies by User-Organizations contribute significantly to the enhancement of air navigation safety in the MID Region. Nevertheless, the meeting noted with concern that the use of the MID Air Navigation Deficiency Database (MANDDD) is far below expectations.

5.3 The meeting noted with concern that the majority of deficiencies listed in the MANDDD have no specific Corrective Action Plan (CAP) and urged States to implement the provisions of MIDANPIRG Conclusion 15/35 related to elimination of Air Navigation Deficiencies, in particular, the submission of a specific Corrective Action Plan (CAP) for each deficiency.

5.4 The meeting reviewed and updated List of Deficiencies in the AOP field as at **Appendix 5A**.

REPORT ON AGENDA ITEM 6: FUTURE WORK PROGRAMME

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

6.2 The meeting agreed on a two-day Aerodrome Safety Management System Seminar/Workshop to be organized by ICAO back-to-back with the next RGS WG/5 meeting. UAE and Egypt offered their technical support to the Seminar.

6.3 Taking into consideration the expected dates for the RASG-MID/7 meeting scheduled to be in the First Quarter of 2019 and the RSC/6 meeting scheduled to be held in Cairo, Egypt, 25-27 June 2018, it was agreed that the RGS WG/5 meeting be planned for the November 2018. Accordingly, the meeting agreed on the following tentative schedule for 2018:

- Wildlife Hazard Management and Control Workshop: 4 - 6 September 2018 hosted by Sudan
- RGS WG/5: 25 - 27 November 2018
- Aerodrome SMS Workshop: 28-29 November 2017

6.4 In addition, the meeting also noted with appreciation the interest of UAE to host the “Ground Handling Services Safety” Seminar in the First Quarter of 2019.

REPORT ON AGENDA ITEM 7: ANY OTHER BUSINESS

7.1 The meeting noted that South Sudan, JUBA/Juba (HSSJ) is included in the list of International Aerodromes required in the MID Region (MID e-ANP Volume I and II – AOP tables). Sudan confirmed that they do not oversight Juba International Airport. The meeting requested the ICAO MID Office to verify the case of Juba Intl Airport in coordination with the ESAF Office and ICAO HQ, in order to take necessary action for its removal from the MID eANP.

APPENDICES

APPENDICES

APPENDIX 2A

RASG-MID/6 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS
<p>CONCLUSION 6/2: SAFETY MANAGEMENT IMPLEMENTATION</p> <p><i>That States, regional and international organizations are invited to share tools and examples, which support effective safety management implementation, to be considered for posting on the ICAO safety management implementation website.</i></p>
<p>CONCLUSION 6/4: SHARING OF SAFETY RECOMMENDATIONS</p> <p><i>That,</i></p> <ul style="list-style-type: none">a) <i>States be urged to share their Safety Recommendations after investigation of accidents and incidents; and</i>b) <i>MID-SST to coordinate with MID-ASRT, ICAO and stakeholders the development of a RASG-MID Safety Advisory to consolidate a set of safety recommendations addressing the Focus Areas and Emerging Risks in the MID Region.</i>
<p>CONCLUSION 6/5: ADOPTION OF ISAGO AND IGOM FOR GROUND HANDLING OPERATIONS</p> <p><i>That, States be invited to:</i></p> <ul style="list-style-type: none">a) <i>encourage airlines and aerodrome operators to implement the procedures contained in the IATA Ground Operations Manual (IGOM) for harmonization purpose and to improve safety of Ground Handling Operations; and</i>b) <i>use the IATA Safety Audit for Ground Operations (ISAGO) as a source of safety data which provide complementary information for the safety oversight activities of ground handling operations services.</i>
<p>CONCLUSION 6/6: DEVELOPMENT OF ADDITIONAL GROUND HANDLING OPERATIONS PROVISIONS</p> <p><i>That, ICAO be invited to consider the development of additional Ground Handling Operations provisions.</i></p>
<p>CONCLUSION 6/7: EXPANSION OF THE RSP SCOPE</p> <p><i>That, ICAO be invited to consider the expansion of the ICAO Runway Safety Programme (RSP) scope to include the movement area (including aprons).</i></p>

CONCLUSIONS AND DECISIONS
<p>DECISION 6/12: RASG-MID SAFETY ADVISORY - WILDLIFE MANAGEMENT AND CONTROL</p> <p><i>That, the RASG-MID Safety Advisory (RSA/13) on Wildlife Management and Control at Appendix 3I is endorsed and be published by the ICAO MID Office.</i></p>
<p>DECISION 6/13: AMENDED RASG-MID SAFETY ADVISORY/12 – LASER ATTACK SAFETY GUIDELINES</p> <p><i>That, the revised version of the RASG-MID Safety Advisory (RSA/12) on Laser Attacks at Appendix 3J is endorsed and be published by the ICAO MID Office.</i></p>
<p>CONCLUSION 6/14: REVISED MID REGION SAFETY STRATEGY</p> <p><i>That, the revised version of the MID Region Safety Strategy at Appendix 3N is endorsed (IP/3)</i></p>

APPENDIX 3A

DIP Tracking for MID-RAST/RGS/2

Development guidance material and training programmes to support the creation of action plans by local aerodrome Runway Safety Teams (RST)

RGS/2 DIP Deliverable	Target Date	Status	Comments
✓ Develop and issue Stop Bar guidance documentation for consideration of LRSTs	End April 2014	Completed	RASG-MID Safety Advisory (RSA-01) circulated to States on 2 November 2014 (Ref: ME 4-14/253).
✓ Organize a Workshop for Regional RST Go-Teams	End June 2014	Completed	3 June 2014 – see <i>RASG-MID/4 WP/7 - Outcome of MID-RRSS/2</i> for details.
✓ Develop and issue regulatory framework supporting establishment of LRSTs	End September 2014	Completed	RASG-MID Safety Advisory (RSA-02) circulated to States on 20 January 2015 (Ref: ME 4-15/014).
✓ Develop and issue a model checklist for LRSTs	End December 2014	Completed	RASG-MID Safety Advisory (RSA-03) circulated to States on 16 March 2015 (Ref: ME 4-15/078).

APPENDIX 3B

DIP Tracking for MID-RAST/RGS/3

Development guidance material and training programmes to support Aerodrome Infrastructure and Maintenance Management

RGS/3 DIP Deliverable	Target Date	Status	Comments
✓ Conduct a MID-Regional Runway Safety Seminar	End June 2014	Completed	4 June 2014 – see <i>RASG-MID/4 WP/7 - Outcome of MID-RRSS/2</i> for details.
✓ Organize a Regional Aerodrome Certification Workshop	End June 2014	Completed	4 June 2014 - see <i>RASG-MID/4 WP/7 - Outcome of MID-RRSS/2</i> and <i>RASG-MID/4 WP/8 - Runway Safety Related Issues</i> .
✓ Develop a MID-Region Aerodrome Certification toolkit for States.	End March 2015	Completed	RASG-MID Safety Advisory (RSA-05) circulated to States on 10 September 2015 (Ref: ME 4-15/261).
✓ Develop and issue guidance material on periodic surveillance audits of Aerodrome Infrastructure and Maintenance	End March 2016	Completed	RASG-MID Safety Advisory (RSA-10) was circulated to States on 22 August 2016 (Ref: ME 4-16/232).
Develop and issue guidance material on proactive oversight of Aerodrome Infrastructure Development	End November 2017	In Progress	Draft to be circulated to members for review by end November 2017.

APPENDIX 3C

GUIDANCE MATERIAL ON PROACTIVE OVERSIGHT OF AERODROME INFRASTRUCTURE DEVELOPMENT

MAINTAINING OPERATIONAL SAFETY LEVEL ON AERODROMES DURING CONSTRUCTION

1. Introduction

1.1 Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can endanger operational safety. Safety considerations are essential and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project and to enhance the day-to-day airport maintenance operations.

1.2 Safety must be an integral part of each activity. Full participation, cooperation, and support are necessary and required to ensure the safety at airfield

1.3 In accordance to (State) National Regulation part xxxx (x), xx (State Advisory Circular) No. xxx Chapter (xx), a Work Safety Plan should be prepared by the Aerodrome Operator prior to commencement of any aerodrome construction/development project, so as to ensure that necessary precautions shall be undertaken with the aim to accomplish highest safety levels during construction/development works.

1.4 As the Airport Operator is responsible for maintaining operational safety during construction by putting all construction activities under control and providing sufficient warning for pilots, So, The Airports Entity in Charge should prepare methodology of Construction Safety at airports in order to help the airport operator and contractor in the preparation of Safety Construction documents, in case of performing of any projects within Movement area at airports taking into account the obligation on implementing National regulation.

1.5 Construction safety methodology provides a good framework for good practice for mitigating and controlling the risks emitted from construction at airfield during aircraft operation.

1.6 Consequently, good practice methodology is particularly needed in order to collect relevant and accurate data on Construction project and its location at airfield to identify all components of hazard as an initial step to put suitable safety measures to ensure safety during Construction activities.

1.7 Contractors are charged with the responsibility for conducting their operations in a manner that will provide safe working conditions for all employees and the protection of the aircrafts is exposed to the project.

2. Construction Safety Methodology Consisted of Four Sections as following

2.1 Procedures to establish Construction safety plan by committee comprising representatives from the Airport management, Air Traffic Control, Airport Maintenance Department, and contractors' agent.

2.2 General precautions should be obligated by contractors before and during construction activities at airfield.

2.3 Explanation of work in progress checklist reference to ECAR 139 and EACs 139.

2.4 Procedures to implement displaced threshold before the commencement of any work on the RWY.

3. Basic Safety Precautions should be Taken into Account by Contractor to Prevent Negative Effect on Aircraft Operation during Work Activities

3.1 Prevent employees, subcontractors, suppliers, and vendors or equipment from intruding upon the movement area, without the knowledge and concurrence of the Airport Operations Supervisor.

3.2 Prevent trash, water, dirt, dust, debris, or other transient materials with Foreign Object Damage (FOD) potential from entering into or remaining in construction and/or maintenance areas, whether on runways, taxiways, aprons, or in related safety areas. Further, the Contractor shall not allow any material or equipment to obscure pavement markings, pavement edges, or detract from the visibility of runway/taxiway markings or lighting.

3.3 Not use any vehicles, equipment, excavations, stockpiles, or other materials which could degrade or otherwise interfere with the electronic signals from radios or electronic navigational aids.

3.4 Smoking by personnel is prohibited on the movement area.

3.5 Ensure proper radio communication coordination between the construction and air traffic control tower as required in the movement area.

3.6 Remove all bird attractions, such as edibles (food scraps, etc) or other miscellaneous garbage, trash, or pooled water while on or near the airports.

3.7 Secure all material and equipment, such as lightweight construction materials, to prevent displacement from wind or jet blast.

3.8 Provide and monitor adequate and proper fencing, barricading, marking, and lighting of construction, maintenance or other sections that are temporarily closed to normal airport use.

3.9 Ensure that no hot work welding or cutting operations which may provide an open flame or hot surface are performed until a permit obtained to conduct such operations.

APPENDIX 3D

DIP Tracking for MID-RAST/RGS/4

Aerodrome Safeguarding

RGS/4 DIP Deliverable	Target Date	Status	Comments
✓ Safeguarding Guidance Toolkit	April 2016	Completed	RASG-MID Safety Advisory (RSA-11) on Safeguarding of Aerodromes was circulated to States on 29 March 2017 (Ref: ME 4-17/066).
Regional Workshop	December 2017	In-Progress	The Workshop will be hosted by Egypt in Cairo from 4-6 December 2017 with speakers provided by Egypt and UAE. Invitation Letter (Ref: AN 5/26-17/278) for Aerodrome Safeguarding Workshop was circulated to States on 12 October 2017.

APPENDIX 3E

Safeguarding Regulatory System
Toolkit

These guidelines are developed by the Runway and Ground Safety Working Group (RGS WG), as part of MID-RAST/RGS/3 DIP deliverables, based on the work of the Egyptian Civil Aviation Authority in collaboration with the ICAO MID Regional Office within the framework of RASG-MID the Regional Aviation Safety Group - Middle East (RASG-MID).

Disclaimer

This document is intended to provide guidance for civil aviation regulators, aerodrome operators and other stakeholders involved in aerodromes infrastructure and maintenance.

The document has been compiled by members of the aviation industry to enhance aviation safety. It is not intended to supersede or replace existing materials produced by the State or in ICAO SARPs. The distribution or publication of this document does not prejudice the State's ability to enforce existing National regulations. To the extent of any inconsistency between this document and the National/International regulations, standards, recommendations or advisory publications, the content of the National/International regulations, standards, recommendations and advisory publications shall prevail.

DRAFT

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ADVICE NOTE 1

INTRODUCTION

1. BACKGROUND

1.1 Safeguarding has been identified by the MID Region Annual Safety Report Team (RAST) as one of three main risk areas (Focus Areas) to be addressed under the MID Region Aviation Safety Group (RASG-MID) framework.

1.2 The MID-RAST RGS has undertaken a Safety Enhancement Initiative (SEI) to develop guidance material and training programs to support creation of action plans for Safeguarding.

1.3 The Detailed Implementation Plan (DIP) for the SEI included the action to develop and issue regulatory framework supporting establishment of Safeguarding teams.

2. PURPOSE

The purpose of this circular is to propose a regulatory framework to support the creation and success of a national Safeguarding System supported by the following elements:

(Chapter 1)

1- **Primary Regulations** to be included in the national regulations that are relevant to Safeguarding stakeholders who hold primary responsibility for Safeguarding of aerodromes. Ministerial decrees that may have been or are to be issued to promote aerodrome safeguarding (e.g. providing for coordination between Aviation and local planning authorities, establishment of a national aerodrome safeguarding committee, establishment of aerodrome safeguarding areas underlying the OLS, PANS-OPS, OAS surfaces and other critical areas that must be safeguarded so as to ensure safe operations of aircraft and national aerodromes) are to be also included. In the model framework this has been identified as the Civil Aviation Authority and Aerodrome Operator,

(Chapter 2)

2- **Supporting Regulations** to be included in the national regulations relevant to other Authorities who have not been identified as primarily responsible for safeguarding of aerodromes.

(Chapter 3)

3- **Guidance Material** to be developed in support of the regulations and to provide details regarding the conduct of the Safeguarding entity. This is to be considered in conjunction with ICAO annex 14 and related documents as well as PANS-OPS and related documents.

(Chapter 4)

4- **Oversight Material** to be developed and added to the existing safety oversight procedures of national regulators. This material can also be used by the Safeguarding stakeholders for their internal safety assurance processes.

USING THIS CIRCULAR

The Table of Contents provides key points of the regulatory framework supporting the creation of a nation aerodrome Safeguarding management system.

The reader will go through the steps of building its own safeguarding management system and could make any changes to any part the way it suite their needs and assure the implementation of acceptable level of aerodrome safeguarding.

This circular as it serves to further empower national authorities in their efforts to support establishment of Safeguarding system through model national regulation, guidance materials.

DRAFT

CHAPTER 1

PRIMARY REGULATION

1.1 Application

It is recommended the below model regulation be included in the national regulation relevant to the stakeholder primarily responsible for aerodrome safeguarding in order to support the development of a national aerodrome safeguarding management system. In this example those stakeholders are the CAA and Aerodrome Operator.

The regulation is high level, noting it is aligned with aerodrome certification and safety management system principles. The regulation also provides a positive requirement for the CAA and aerodrome operator to ensure participation of all relevant stakeholders

1.2 Model Regulation

Aerodrome Safeguarding Management System

1.2.1 The ECAA Should:

- 1.2.1.1 Ensure that rights are established in the national law and relevant regulations, for Safeguarding of all aerodromes according to ICAO requirements including control of human activity within safeguarding areas, with definition of the word human activities (construction; lights; material used; change of land use; laser;) and clear statement on the Local Planning Authorities' mandatory duty to report any existing and proposed human activity within aerodrome safeguarding areas to the CAA for assessment;
- 1.2.1.2 Review and endorse:
 - Safeguarding requirements for each aerodrome and,
 - Safeguarding management system that has been put in place by the aerodrome operator;
- 1.2.1.3 Audit aerodromes operators to ensure efficient implementation of the aerodrome safeguarding management system;
- 1.2.1.4 Carry out safeguarding regular inspections;
- 1.2.1.5 Ensure that CAA safeguarding personnel are invested with judicial officer's right to access to such places as may be necessary to carry out the safeguarding inspections and audits and testing;
- 1.2.1.6 Define the entities invested with the power to impose the national law penalties in the event of detection of aerodrome safeguarding violations

1.2.2 The Aerodrome Operator should:

- 1.2.2.1 Establish safeguarding management system acceptable to CAA that, as a minimum complies with the requirements of the national safeguarding regulation and includes requirements such as:
 - a. Establishment of safe guarding team with clear organizational structure;
 - b. Establishment of obstacles' monitoring system and procedures.
 - c. Ways of identifying obstacle and Dealing with them
 - d. Procedures and documentations needed to contact CAA for assessment of new development around aerodromes; and
 - e. Land use roles and restrictions.
 - f. Terrain and obstacles data collection, according to QMS

- 1.2.2.2 Comply with the requirements stipulated in the CAA National Regulations and related laws regarding Safeguarding;
- 1.2.2.3 Establish, lead and implement Safeguarding requirement to promote safety and the exchange of safety-relevant information; and
 - Put in place Safeguarding monitoring system, and procedures for implementation
 - Require the organisations operating or providing services at the aerodrome to be involved in such system.

1.2.3 Supporting Ministerial Decree(s) should include:

- 1.2.3.1 Definitions/ description and purpose of OLS and other protection surfaces which define distances and slopes needed for Runway, Radar and Navigation Aids in addition to any other restriction needed.
- 1.2.3.2 Establishment of Safeguarding committee. The Committee shall convene regularly, identify and review national aerodrome safeguarding issues, review and decide on permit applications referred thereto concerning existing or proposed constructions located within the areas underlying the aerodrome safeguarding areas, examine possible solutions and needs for action. Minutes of such meetings, should be kept for reference and information as required.
- 1.2.3.3 Recommended Composition of the National Safeguarding Committee includes, but not limited to, representatives of:
 - a. Civil Aviation Authority
 - b. Aerodrome Operator;
 - c. Radar and Air Navigation Service Providers (ILS, VOR, MICOWAVE....);
 - d. Operational representative; and
 - e. Other Stakeholders as needed.

It is also recommended to include the herein below listed provisions in the Primary regulation provisions related to the following:

- a. Definitions Obstacle Limitation Surfaces Obstacle Limitation Requirements
- b. Terrain and Obstacle Data Collection
- c. Obstacles Restriction and Removal
- d. Inspection
- e. Assessment
- f. Exemption
- g. Shielding Principle
- h. Objects outside OLS
- i. Other Objects
- j. Land Use Hazard
- k. Enforcement

CHAPTER 2

SUPPORTING REGULATION

2.1 Application

- 2.1.1 It is recommended the following model regulation be included in the national regulation relevant to the stakeholder who are critical to the success of the Safeguarding Management system, but are not primarily responsible for the establishment of the system.
- 2.1.2 The critical stakeholders are:
- a. Local Planning Authority
 - b. Any land Owner (personnel or organization)
 - c. Communication and Advertising Companies

2.2 Model Regulation

- 2.2.1 **Local Planning Authority (Housing Law) should:**
- a. Ensure that issued building permits for constructions within the aerodrome safeguarding areas do not have adverse impacts on safety of aircraft operation;
 - b. Ensure that safeguarding violations are removed or reduced as monitored.
 - c. Effect continuous coordination with Civil Aviation Authorities before any:
 - change of Land Use
 - planning of new Urban areas
 - d. Ensure that the property owner shall be responsible compliance with the maximum d height and other conditions, if any, stipulated in the Aviation permit issued, using the right tools of measurements.
- 2.2.2 **Land owners (personnel or organizations) should:**
- a. Notify CAA, sufficiently in advance, prior to commencement of any procedures for type of development on their land if such is located in the vicinity of an aerodrome. The said notification should include, inter alia, detailed particulars of the land (boundaries, elevation of highest point) and details of the proposed development.
 - b. Comply with CAA's conditions or restrictions on the proposed development, if any.
- 2.2.3 **Communication and Advertising Companies should:**
- a. Notify CAA, sufficiently in advance, prior to commencement of any procedures for carrying out any installations within areas underlying the aerodrome safeguarding protection surfaces. The said notification should include, inter alia, detailed particulars of the proposed installation, as appropriate (e.g. location, elevation of highest point, frequencies etc.).
 - b. Comply with CAA's conditions or restrictions on the proposed installation, if any.

CHAPTER 3

GUIDANCE MATERIAL

3.1 Application

The following guidance is recommended to be adopted to support the model regulation for the aerodrome safeguarding stakeholder. In this example that stakeholder is the Aerodrome Operator.

3.2 Model Guidance for Aerodrome Safeguarding Management System

Aerodrome Safeguarding Management System

3.2.1 The Aerodrome Operator should:

- a. Develop charts of the OLS, PANS OPS and other protection surfaces within and outside the aerodrome on charts as per ICAO requirements (national regulation requirements) and seek endorsement thereof by CAA;
- b. Coordinate with Local Planning Authority and other authorities to improve safety outside aerodrome;
- c. Establish an adequately staffed and equipped aerodrome safeguarding entity;
- d. Organize, coordinate and implement aerodrome safeguarding programs to ensure protection of the airspace essential to the safe operation of aircraft at and around the aerodrome.
- e. Coordinate and promote the exchange of information and the joint inspections of areas underlying the aerodrome safeguarding surface, with the aerodrome safety management team as well as businesses and communities in the vicinity of the aerodrome as appropriate;
- f. Ensure the aerodrome safeguarding entity is supported by a Policy and Procedures manual including clear details of the organizational structure, job descriptions, procedures for inspection, reporting of inspection results, dealing with existing and potential obstructions etc.
- g. Identify existing removable and non-removable obstacles at the aerodrome and outside the aerodrome (location, height, nature and use), and undertake the mandatory reporting actions, as appropriate;
- h. Implement suitable strategies and procedures to remove hazardous obstacles or when this is not immediately possible, to undertake the necessary actions to manage and mitigate the risk, including publication Aeronautical Information Publication.

Note: The criteria used to establish and chart the several types of the aerodrome safeguarding surfaces are contained in ICAO Annex 14, ICAO PANS OPS document ICAO Annex 4 — Aeronautical Charts, and related documents thereof.

3.2.2 CAA should:

- a) Establish and implement national safeguarding system to promote safety inside or outside all aerodromes; which include but not limited to:
 1. Develop the Aviation law and regulations of safeguarding foundation and enforcement according to ICAO annex 14 and related documentations and State rules.
 2. Assign Safeguarding team/division in charge of safeguarding and auditing of the aerodromes.
 3. Support technical and audit operator's safeguarding team/departments.

4. Review and approve aerodromes' OLS maps according to national regulations.
 5. Have Obstacles assessment system policy and procedures.
- b) Arrange with Local Planning Authority, concerned ministries and all other parties on aerodrome safeguarding as follows:
1. Provide formal notifications of safeguarding protection area on maps for each aerodrome to the relevant Local Planning Authority.
 2. Review all urban future development within State level .to ensure that none may adversely affect aerodrome future development.
 3. Review and approve different land use locations (industrial, commercial in addition to any wind-farms, electricity poles, communication antennas and advertising high masts).
 4. Review all new roads and bridges including light poles and traffic patterns in area adjacent to aerodromes.
 5. Other information as may be necessary, for example, landscaping details to enable the birdstrike potential to be assessed, or the types of cladding materials proposed so that the potential for radar reflection can be modeled.
 6. As part of the Aerodrome Certificate, CAA has to review/ accept all Obstacles data and the relevant aeronautical studies and make sure that publication in the AIP is made as per the relevant regulations.
 7. Audit and support operator's safeguarding Monitoring system to take necessary actions when needed.
 8. Taking all measures to ensure that obstacles are removed, lowered, marked or lit.
 9. Apply law enforcement in case of violations.
 10. liaise with appropriate planning authorities and companies that erect tall structures, to determine potential infringements. Every effort should be made to implement the OLS standards and limit the introduction of new obstacles. However, when a new obstacle is detected, the aerodrome operator must ensure that the information is passed on to pilots, through NOTAM, in accordance with the standards for aerodrome reporting procedures set out in the relevant regulations.

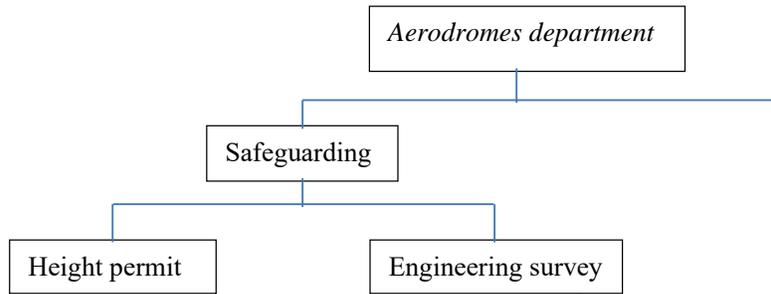
3.2.3 Aerodrome Safeguarding Division should:

Have Specialized training to ensure:

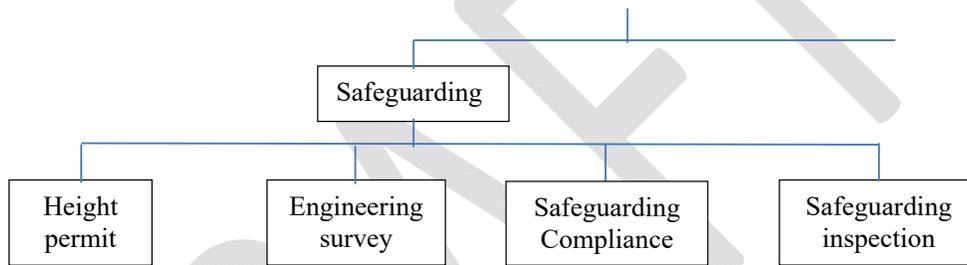
- a) Understanding safeguarding management and obstacles assessment.
- b) Familiarization of safeguarding duties; responsibilities and data collection.
- c) Good use of safeguarding tools.
- d) Accurate obstacle data collection and reporting.
- e) Put in place and implement an effective plan for monitoring including contingency monitor.
- f) Development and implementation of safeguarding filing system.
- g) Detection of changes in the obstacle environment, marking and lighting and in human activities or land use on the aerodrome and the areas around the aerodrome, as defined in coordination with the competent authority.
- h) Take the necessary actions to report to the procedure any changes of the status of the existing critical obstacles and any proposed development that is likely to be higher than the critical obstacles within the area depicted by the procedure designer.
- i) Immediately report to CAA any violation or potential obstacle or new buildings, navigation aid equipment's or changes of use to any building within the aerodrome fence.
- j) Conduct an obstacle survey by competent surveyor to establish the initial coordinates and details of obstacles and conduct periodic surveys thereafter.

- k) Ensure that the runway and taxiway strip areas are free from obstacles or objects which are considered hazardous to aircraft operations unless required to be there for air navigation purposes.
- l) Mitigate the risks associated with changes on aerodrome and its surroundings identified with the monitoring procedures.
- m) Define the scope, limits, tasks and responsibilities for the monitoring in coordination with the relevant local authorities and air traffic services providers, and other relevant authorities.
- n) Assess and mitigate the risks caused by human activities and land use which shall include but not limited to the following:
 - Obstacles and the possibility of induced turbulence;
 - Use of hazardous, confusing, and misleading lights;
 - Dazzling caused by large and highly reflective surfaces;
 - Sources of non-visible radiation, or the presence of moving, or fixed objects which may interfere with, or adversely affect, the performance of aeronautical communications, navigation and surveillance systems; and
 - Non-aeronautical ground light near an aerodrome which may endanger the safety of aircraft and which should be extinguished, screened, or otherwise modified so as to eliminate the source of danger.
- o) Protect area around the aerodrome visual aid outside aerodrome boundary all means of land acquisition (leasing, purchasing etc) or preventing new developments or extensions to existing structures from infringing the OLS.
- p) Report to CAA any infringement or potential infringement of the OLS of nature and location of obstacles, and any subsequent addition, or removal of obstacles for action as necessary, including amendment of the AIS publications.
- q) Take necessary measures to assess the risks resulting from an infringement of OLS to identify whether or not the object creates an unacceptable risk or not, and carry out the necessary actions to remove the obstacle or mitigate the risk as appropriate to protect aircraft using the aerodrome.
- r) Publish and mark, when needed and where necessary, and make visible by means of lights any remaining obstacles.
- s) Provide electronic obstacle data for all obstacles in Area 2 (the part within the aerodrome boundary) that are assessed as being hazardous to air navigation.

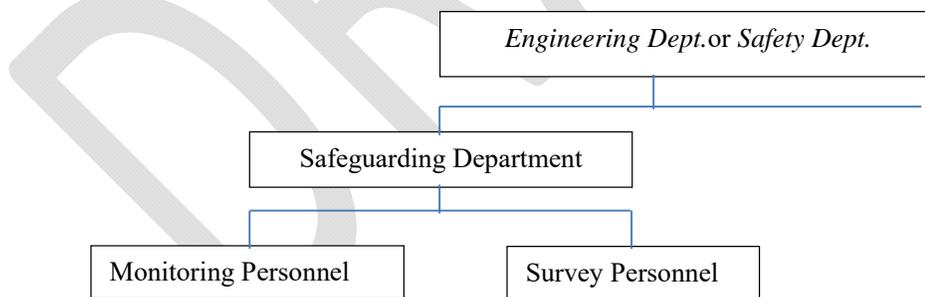
**Examples of Typical Organizational Structure
of Aerodrome Safety Management System**



CAA Safeguarding Structure (Basic)



CAA Safeguarding Structure (Advanced)



Operator's Safeguarding Structure

CHAPTER 4

OVERSIGHT MATERIAL

4.1 Application

It is recommended the below questions are incorporated in existing safety oversight processes of national regulators in order to oversight the implementation and effectiveness of the model primary and supporting regulations.

The materials in section 4.2 may also be used by the aerodrome safeguarding prim stakeholder who holds primary responsibility for aerodrome safeguarding as part of their internal assurance audit processes.

The below checklists elements are recommended for aerodrome safeguarding activities.

4.2 Model Oversight Checklists

Model Checklist: Elements for Safeguarding Management System (within each of CAA and Aerodrome Operator)

Model Checklist: Elements for Aerodrome Safeguarding Division Terms of Reference

Model Checklist: Elements for Aerodrome Safeguarding Division Composition

Model Checklist: Elements for Composition of CAA Committee for Aerodrome Safeguarding

Model Checklist: Scope of Works of Aerodrome Safeguarding entity at the Aerodrome

Model Checklist: Scope of Works of Aerodrome Safeguarding entity at CAA

All were published with the first Advisory

APPENDIX A
SAFEGUARDING CHECKLISTS

INTRODUCTION

- The checklists were developed to give guidance for the purpose of:
 - Starting Safeguarding System, or
 - As guidance for implementation and Obstacle Monitoring.
 - These checklists are result of Egypt's best Practice in Safeguarding with support of UAE, and England experience.
 - It's up to each State to adjust the checklists to suit their national regulation and their view of implementation as long as keeping main line.
 - List of References:
 1. Annex 14 V.I
 2. Annex 15 (e.TOD)
 3. Annex 4 (Aeronautical Charts)
 4. Doc. 9137 Part 6
 5. Doc. 9774
 6. WGS-84 Manual9674
 7. Doc. 9981 ICAO PANS Aerodromes.
-

APPENDIX 3F

DIP Tracking for MID-RAST/RGS/5

Wildlife Management Control

RGS/5 DIP Deliverable	Target Date	Status	Comments
✓ RSA for Regulatory Framework & Guidance Materials	August 2016	Completed	RASG-MID Safety Advisory (RSA-13), <i>Wildlife Management Regulatory Framework & Guidance Materials</i> , was circulated to States on 23 October 2017 (Ref: ME 4-17/292).
Templates on WHMP	End November 2017	In Progress	The Templates have been drafted and presented to RGS WG/4 (Cairo, Egypt, 5-7 November 2017), The Templates was reviewed and will be circulated to MID States (as an Appendix 1 to RSA-13) for their comments before endorsement.
Wildlife Management Control Workshop	September 2018	In Progress	Sudan has offered to host the Workshop in Khartoum in September 2018.

APPENDIX 3G

RASG-MID SAFETY ADVISORY – 13 ATTACHMENT

(RSA-13 – Appendix 1)

XXX 2017



Guidance on Wildlife Hazard Management and Control Plan Template

Date of Issue:	
Revision No:	1
Document Ref. No.:	RASG-MID/RAST/RGS/5 –Appendix 1
Owner:	RASG-MID

These guidelines are developed by the Runway and Ground Safety Working Group (RGS WG), as part of MID-RAST/RGS/** DIP deliverables, based on the work of the Sudanese Civil Aviation Authority, the United Arab Emirates Civil Aviation Authority and the Egyptian Civil Aviation Authority in collaboration with the ICAO MID Regional Office within the framework of the Regional Aviation Safety Group - Middle East (RASG-MID).

Disclaimer

This document has been compiled by members of the aviation industry to provide guidance for civil aviation regulators, aerodrome operators and other stakeholders in order to enhance aviation safety. It is not intended to supersede or replace existing materials produced by the States national regulators or in ICAO SARPs. The publication of this document does not prejudice the National Regulator's ability to enforce existing national regulations. To the extent of any inconsistency between this document and the National/International regulations, standards, recommendations or advisory publications, the content of the National/International regulations, standards, recommendations and advisory publications shall prevail.

ANYNAME? AERODROME

WILDLIFE HAZARD MANAGEMENT PLAN

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COMPANY/AERODROME NAME**WILDLIFE HAZARD MANAGEMENT PLAN (WHMP)****Issue 1****Date:****Chapter 1****1.1 Goals and Objectives**

The goal of this WHMP is to minimise risk for passengers and flight crews by reducing wildlife hazards and associated risks to aircraft and airport operations caused by wildlife activities on and in the vicinity of the airport.

The objectives of the WHMP are to:

- Target high and moderate risk species and habitats that primarily support them both on and off the airport
- Ensure compliance with all relevant airport operational and environmental legislation and regulations
- Ensure that adequate systems are in place to define roles, responsibilities and procedures for managing wildlife risks at [ANY AIRPORT]
- Define the methods by which wildlife hazards are managed at [ANY AIRPORT]
- Develop performance goals and targets for management of wildlife issues and outline how these will be assessed and reviewed

[Add to or delete as appropriate]

1.2 The Airport

[ANY AIRPORT] is situated in the [LOCAL GOVERNMENT AREA NAME] in [STATE/TERRITORY]. A description of the airport is provided in Table 1 below.

Table 1 - [ANY AIRPORT] general information

Element	Description
Airport location	[DESCRIPTION]
Surrounding land use(s)	[DESCRIPTION]
Elevation	[DESCRIPTION]
Airport ownership	[DESCRIPTION]
Airport operator	[DESCRIPTION]
Traffic profile	[DESCRIPTION]
Runways no./ designation	[DESCRIPTION]
Navigation aids	[DESCRIPTION]
Communications	[DESCRIPTION]
Hours of operation	[DESCRIPTION]

Climate	[DESCRIPTION]
Other	[DESCRIPTION]

1.3 The Management of the Wildlife / Bird Strike Risk (Policy Statement)

[ANY AIRPORT] is committed to ensuring the safety of aircraft using [ANY AIRPORT]. While the safety of aircraft at [ANY AIRPORT] is paramount, it is not possible to prevent all wildlife strikes. The WHMP aims to reduce the frequency and severity of strikes by focusing management efforts on species and habitats that constitute significant hazards to aircraft that operate at [ANY AIRPORT].

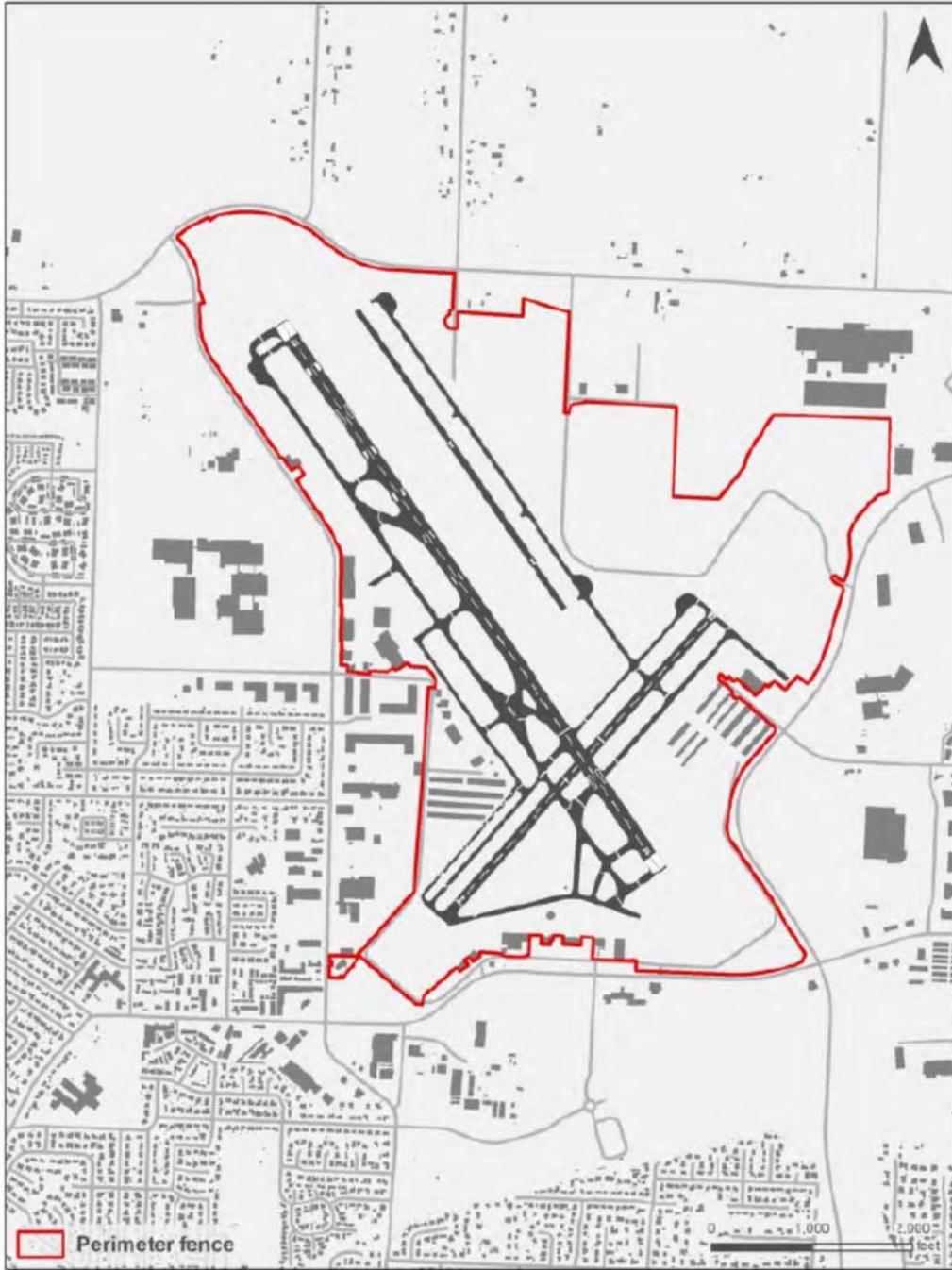
[Add to or delete as appropriate or insert your existing airport policy relating to wildlife management]

ANYAIRPORT have measures in place, which are aimed at deterring wildlife and birds from settling, and flying on and in the lower flight paths in the vicinity of the airfield as is reasonably practicable.

These measures include:

- Hazard Identification and Risk Assessment of bird activity (see SMS Doc)
- A Wildlife Hazard Management Plan (WHMP)
- Control procedures introduced aimed at reducing the presence of wildlife ~~birds~~ on the airfield and therefore reducing the risk of a wildlife / bird strike.
- The effective use of resources and equipment?
- A suitably trained wildlife / bird Control Co-Ordinator (WCCO) to oversee the Wildlife Hazard Management Plan

These measures reflect the principles of safety management which the Aerodrome Operator is required to apply to all aspects of aircraft operations within its responsibility.



Airport Layout Plan

Wildlife Hazard Management Plan

Chapter 2

1. Roles & Responsibilities

The roles and responsibilities of ANYAIRPORT staff are important elements of the Aerodrome Operator's Safety Management System and a contribution to the effectiveness of the WHMP. All staff will have a thorough understanding of their roles within the plan. The roles and responsibilities are detailed below:

1.1. Aerodrome Manager/**wildlife/bird** Control Manager

The Overall accountability for bird control lies with the Aerodrome Licence holder/Director/Safety Action Group (SAG), However, the responsibility could be delegated to the Aerodrome Manager/BCCO whose core responsibilities are to:

- Assess the **wildlife/bird** strike risk level
- Determine policy and produce and review the WHMP
- Implement the WHMP
- Ensure the inclusion in the Aerodrome manual is correct

The role includes the following tasks:

- Monitoring and acting on **wildlife/bird** behavior on and in the vicinity of the Aerodrome
- Implementation of habitat management i.e.: Vegetation policy, maintenance programmes in accordance with WHMP and to review and introduce modifications to this programme when necessary
- Analyse and interpret the log records of bird control activity and bird strike Reports and ensure this information is promulgated to all stakeholder and the accountable person
- Regular surveys of **wildlife/bird** concentration and movements in the local area. Liaising with local **wildlife/bird** watchers associations for further information
- Liaise with local land owners and game keepers to obtain information on farming plans, game conservation etc
- Seeking advice and assistance where appropriate from Local Planning Authority and outside specialists on matters requiring expert advice
- To ensure the WHMP reflect the current policy of the CAA and best practice in the aviation industry.

Wildlife Hazard Management Plan

1.2. **Wildlife/bird Control Co-Ordinator (WCCO) and Deputy (or equivalent position)**

The overall responsibility for **wildlife/bird** control lies with the Aerodrome Manager/**wildlife/bird** control manager however the day-to-day management and efficient implementation of the WHMP lies with the wCCO. (The wCCO should have had some training on the subject and preferably have an active interest in bird control)

Their role includes the following tasks:

- Advise the Aerodrome Manager on all matters relating to **wildlife/bird** activity and **wildlife/bird** strike prevention
- Plan and organise all **wildlife/bird** control operations in accordance with the WHMP
- Ensure bird control operations are implemented in accordance with the WHMP
- Supervise bird control record keeping
- Assist with the supervision of intelligence gathering and planning
- Ensure the correct maintenance of the **wildlife/bird** control equipment
- Provide information and communications between all interested parties/stakeholders
- Provide a periodic (could be quarterly, six monthly or annual) **wildlife/bird** control report to the accountable person/s

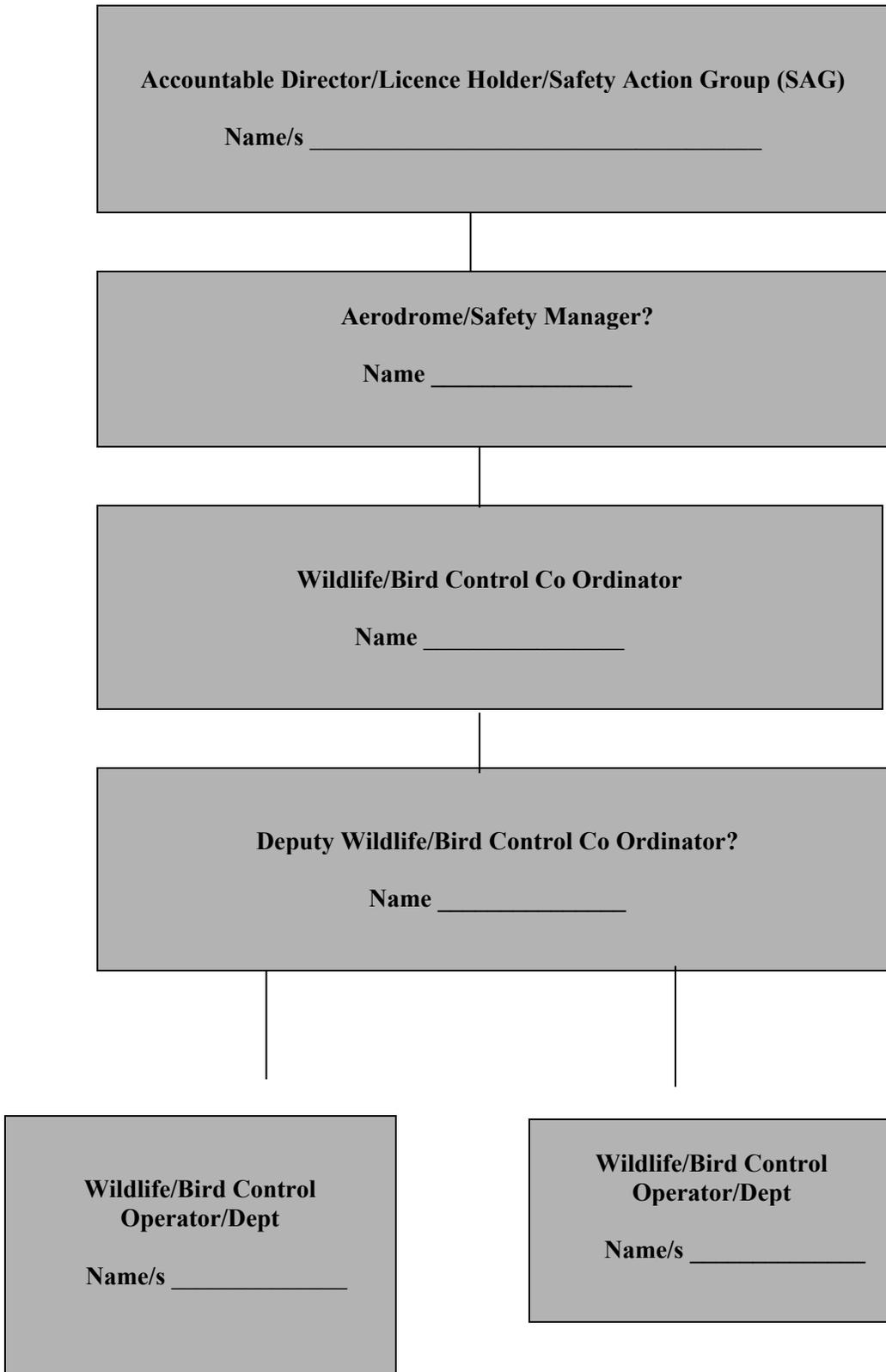
1.3. **The Wildlife/Bird Control Operator Performs the Front Line Role**

Their role includes the following tasks:

- Maintain proactive surveillance of **wildlife/bird** activity on the airfield
- Implement active **wildlife/bird** control measures in accordance with the WHMP
- To reduce wherever possible any identified **wildlife/bird** strike risk
- Record **wildlife/bird** and **wildlife/bird** control activity including any dispersal methods used
- Record and report actual, potential or suspected **wildlife/bird** strikes

*Note: **Appendix E Key Roles and Responsibilities** in **RSG ***** provides a guide for the key roles and responsibility, for further information can be found: ICAO Airport Service Manual, part 3, Wildlife Control and Reduction, 3.3 Role of the Airport Operator and 3.4 Role of Bird/ Wildlife Strike Control Coordinator and ACI Wildlife Hazard Management Handbook Section 2*

2. **Flow Chart**



Wildlife Hazard Management Plan

Chapter 3

1. Hazard Identification

In order to manage the risk of a wildlife/bird strike, _____ aerodrome has developed a procedure for obtaining information regarding the potential wildlife/bird strike risk. wildlife/bird Activity on and in the vicinity of the airfield is assessed on a regular basis and a Hazard Log/Risk Assessment produced.

Probability and severity of a risk vary with species, i.e. geese or skylark and time of year for a particular species i.e. rooks peek in March/April.

*Note: Appendix c in RSG *** provides a guide for the Risk Analysis for further information can be found: ICAO Airport Service Manual, part 3, Wildlife Control and Reduction, ch 6 , icao doc 9859 and ACI Wildlife Hazard Management Handbook Section 3*

2. Example Hazard Log

HAZARD IDENTIFICATION	RISK ASSESSMENT DONE	RISK ACCEPTABLE?
Wood pigeon activity on the south side of the aerodrome	03/07/08 and filed in ref	Yes

3. **Example Risk Assessment** carried out for
Bird Activity on the Aerodrome

Significant Hazards identified from (name source) eg MOR	Severity Value (S) <i>(see 1)</i>	Likelihood Value (L) <i>(see 1)</i>	Level of Risk (S x L) <i>(see 2)</i>	Control Measures to be Implemented	Action By:	Revised Level of Risk <i>(see 3)</i>
Wood pigeon activity on the south side of the aerodrome						

1. For Severity and Likelihood Value, refer to Risk Assessment Matrix attached
2. For Level of Risk, multiply Severity Value x Likelihood Value
3. For Revised Level of Risk, repeat Severity Value x Likelihood Value after implementing control measures

<u>Level of Risk Key:</u>	
1 to 4	Risk Acceptable
5 to 9	Risk undesirable (but tolerable)
10 to 25	Risk Unacceptable

Wildlife Hazard Management Plan

Chapter 4

Risk Reduction

Prevention of a bird strike is not always possible, so to reduce the risk a WHMP has been formulated and introduced as part of [Anynames](#) Aerodromes Safety Management System (SMS).

Our Airfield activities include (Examples: the correct use of the 'Scarecrow Bio-acoustic system', trained staff, recording bird activity and dispersal, habitat management i.e. vegetation removal/cutting and/or grass treatment, culling activity with the local gun club).

Good control should be achievable on the airfield: however, off airfield, control could be less achievable. (See page 10)

Wildlife Hazard Management Plan

Chapter 5

1. Bird strike Reporting

- 1.1. Bird/wildlife incidents are defined in(*demonstrate your incident reporting system , this system may be electronic or other*). These are:

1. Confirmed Strikes
2. Unconfirmed Strikes
3. Serious incidents

- 1.2. The airfield records all bird strikes as far as it is able. This data is submitted to the CAA by electronic/other format standard reporting form.

The form can be found in (Aerodrome Reference Document _____)

2. Online Reporting

The UAE online reporting system, can be used as a guide to establish reporting system of incident reported

<https://www.gcaa.gov.ae/en/rosi/Pages/home.aspx>

Wildlife Hazard Management Plan

Chapter 6

1. Bird/Wildlife Management of the Airfield

1.1. ICAO defines the vicinity of an aerodrome as a 13km bird circle surrounding the airfield. The **anytime** aerodrome conducts annually a survey of 'Off airfield' issues. These include current developments and proposed developments such as for example:

- Landfill sites (food waste attracts gulls and starlings which travel up to 30 miles)
- Aggregate developments (large areas filled with water attract feral geese etc)
- Industrial developments with flat roofs (these provide a safe breeding habitat for gulls and waders)
- Sustainable Drainage Schemes (SUDS) which attract feral geese and wildfowl
- Amenity planning (short grass and bird feeding by the public attract various species)
- Golf Courses (water and short grass attract feral geese etc)
- Nature Reserves (designed to improve bio-diversity attract several species)

Airport Developments

1.2. The **airport operator** ~~seeks to have input into planning decisions and land use practices within the 13km bird circle for liaison with non-airport agencies and local landowners~~ for any development that may attract significant numbers of hazardous birds/wildlife. Any new developments (**crop harvesting, seed planting, ploughing, establishment of land or water features, hunting, etc., that might attract birds/wildlife**) are subjected to the aerodrome safeguarding policy and to a risk assessment process and changes to the proposal sought or opposed if a significant increase in bird activity is likely and bird strike risk is increased as a result

2. List All Sites Below (High Risk within 5km)

2.1. These sites identified are all within 5km of the airfield and are listed below, numbered in order of risk to the aerodrome, with a summary of the site, and these sites are illustrated on the Bird Circle map /**wild life attraction maps**

1. **Anyname mere**
2. Anyname water park
3. Anyname nature reserve
4. Anyname refuse disposal site

- 2.2. These sites are outside the 5km ~~bird circle~~, but fall within the ICAO 13km circle surrounding the airfield, however they attract significant wildlife /bird species and are included for the purpose of bird/wildlife management off airfield.

3. List All Sites Below (Low Risk outside 5km but within 13km)

5. **Anyname Fishing Club**
6. Anyname Housing Development

EXAMPLES of what a LOW/HIGH Risk Site Information Plan Might Look Like:

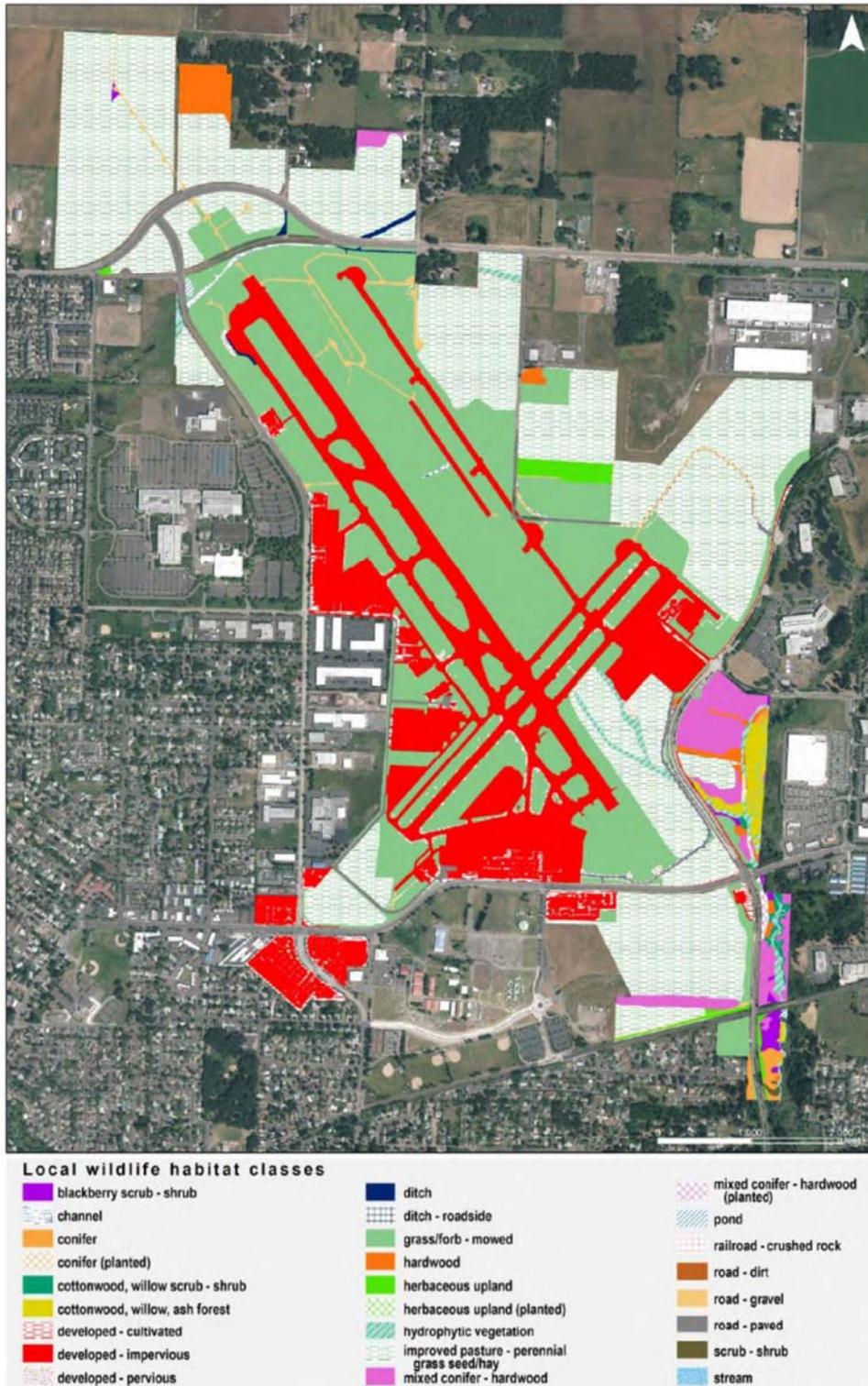
Protocol of site information for priority targets

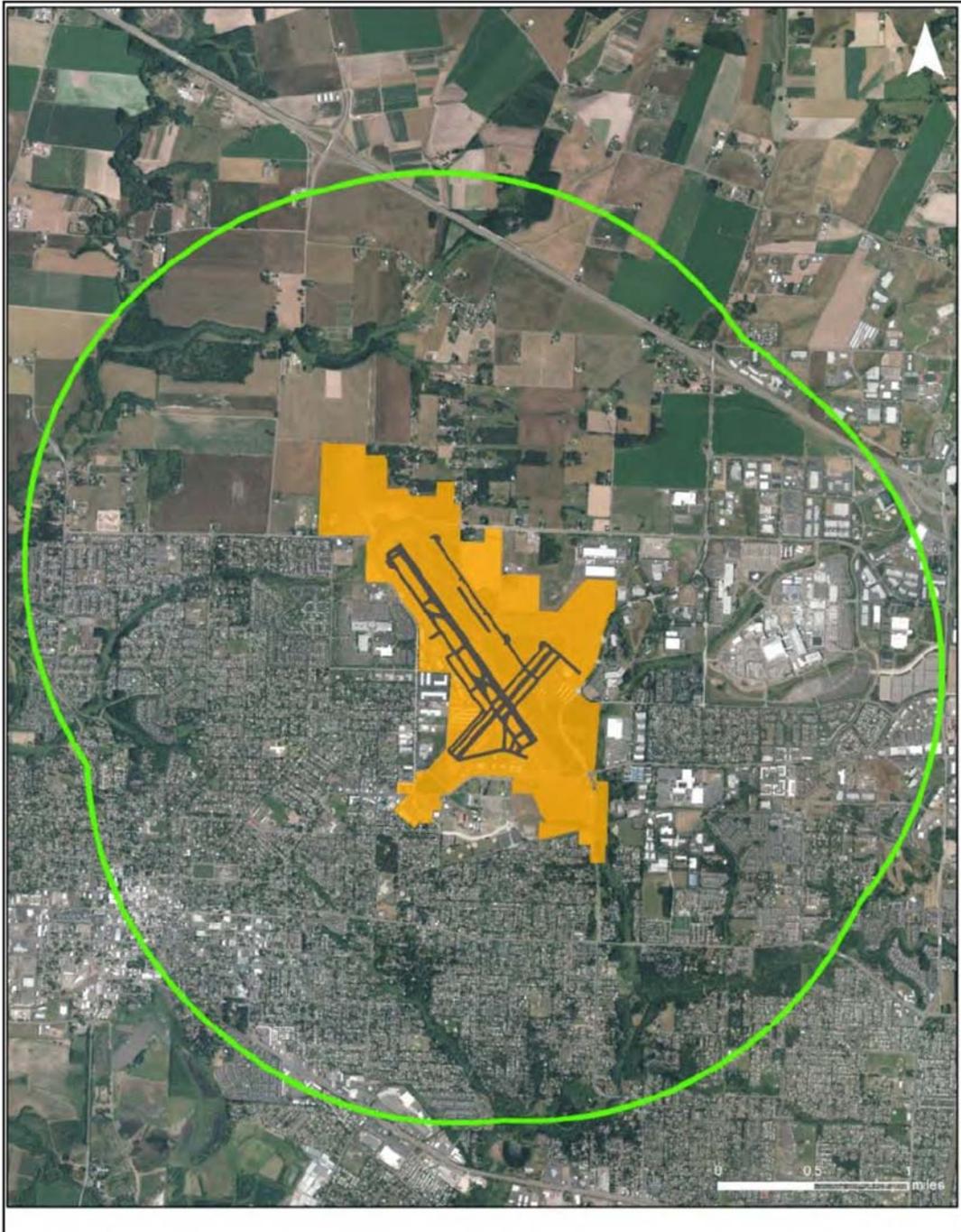
Ref: 5	Risk: LOW	Site:	Name of site		
Description	Medium sized fishing lake?				
Os grid ref	SJ813713		Co-ordinates	381375	371375
Distance from airport	6.4 miles		Bearing in degrees	178.50	
Contact	Name of Fishing Club or person in charge.		Telephone		
Month visited/date			Time		
Site description					
Area/size of water body	Approx				
Adjacent terrestrial habitat					
Photograph					
Aerial photograph					
Usage	Private fishing club. No public access and no sign of disturbance other than fishing.				
Management	Well-managed site by the Fishing Club Committee and happy to provide updates on bird activity when requested?				
Species name	Population count		Acitivity		
Canada Geese	4		roosting		
Coot	3		present		
Mallard	8		present/ roosting		
Little Grebe	1		Calling (territorial display)		

Ref: 1	Risk: HIGH	Site:	Anyname Mere	
Description	Mere with island			
Os grid ref (Optional)	SJ766785	Co-ordinates		376750 378434
Distance from airport	2.8 miles	Bearing in degrees		219.00
Contact	Could be Local Council		Telephone	
Month visited/date		Time		
Site description				
Area/size of water body	Approx			
Adjacent terrestrial habitat				
Photograph				
Aerial photograph				
Usage	There appears to be public access around most of the mere's perimeter. There is evidence of dog walking and recreational use by family and children for picnics etc that could be a bird attractant.			
Management				
Species name	Population count	Acitivity		
Canada Geese	200	feeding		
Moorhen	1	present		
Lapwings	300+	present		
Mallard	30	feeding/ roosting		
Coot	6	territorial disputes		
Swans	2	feeding		
Black Headed Gulls	40	present		

EXAMPLES of what a site plan might look like:







Insert Maps / Bird Circle Map

Plot the sites identified on to the Bird Circle map

Wildlife Hazard Management Plan

Chapter 7

Aerodrome Ornithology

Wildlife/Bird control personnel are able to identify correctly and be familiar with the behavior of all birds species commonly encountered on the airfield and identified with in this WHMP. This information can be found in the WHMP file (wildlife/bird description and possibly a photograph).

Add photographs of most common species with a description and some information in regards to behavior and seasonal activity.

APPENDIX 3H

DIP Tracking for MID-RAST/RGS/6

Laser Attacks

RGS/6 DIP Deliverable	Target Date	Status	Comments
✓ RSA for Guidance Material	September 2016	Completed	RASG-MID Safety Advisory (RSA-12) on Laser Attacks Safety Guidelines was reviewed by RGS WG/3 and was circulated to States on 29 March 2017 (Ref: ME 4-17/067).
✓ Amended RSA-12	September 2017	Completed	Amended RASG-MID Safety Advisory (RSA-12) on Laser Attacks Safety Guidelines was circulated to States on 23 October 2017 (Ref: ME 4-17/291).
✓ ICAO to issue State Letter to promulgate regulations on Laser Attacks	June 2015	Completed	Letter issued by ICAO MID on 3 September 2015.
✓ RSA with Case Studies	November 2017	Completed	Draft has been prepared and previously reviewed by RGS/3 and endorsed by RSC/5. RGS/4 Meeting recommended its circulation to States as an Appendix to RSA-12

RASG-MID SAFETY ADVISORY – 0X

(RSA-0X)

xxxx 2017



MID-Region

Case Study on Laser Attacks

Date of Issue:	xxxxxx
Revision No:	1
Document Ref. No.:	RASG-MID/MIDRAST/RGS/SEI/06-Appendix 1
Owner:	RASG-MID

These guidelines are developed by the Laser Attacks team - Runway and Ground Safety Working Group (RGS WG), as part of MID-RAST/RGS/6 DIP deliverables, based on the work of NANSC under supervision of the Egyptian Civil Aviation Authority in collaboration with the ICAO MID Regional Office.

Disclaimer

This document is intended to provide guidance for civil aviation regulators, aerodrome operators, air traffic service providers and aircraft operators regarding establishment of Laser Attacks incidents database and a model case study for laser attacks in order to mitigate the risk of laser attacks pointed at an aircraft/ATC tower. Especially, during critical phases of flight, which can cause Loss of Control In-flight (LOC-I) or going around.

This document has been compiled by members of aviation industry to enhance runway safety. It is not intended to supersede or replace existing materials produced by the National Regulator or in ICAO SARPs. The distribution or publication of this document does not prejudice the National Regulator's ability to enforce existing National regulations. To the extent of any inconsistency between this document and the National/International regulations, standards, recommendations or advisory publications, the content of the National/International regulations, standards, recommendations and advisory publications shall prevail.

Regional Safety Advisory

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INTRODUCTION

BACKGROUND

Laser (Light Amplification by Stimulated Emission of Radiation) illumination increase every year all over the world. Including the MID Region as reported in ICAO annual safety report 2014, also a CANSO survey has shown laser attacks are on the increase, moreover, FAA had the same results.

In the last three years, there has been an increasing number of laser-beam attacks affecting daily night operations at 3 airports, especially during critical phases of flight (90% of laser illumination was during approach phase at Alpha airport). Hand-held laser-beam attacks affected aircraft and ATC Tower CAP; moreover, Laser illumination, dazzling light and fireworks negatively impacts flight safety, creates hazards. And the safety of pilots eyes, aircraft operations and passengers alike.

Handheld lasers vary in strength, colour and wavelengths (400-700 nm). That is why class and colour classify Lasers. While the FAA says the lasers cause a safety concern, no accidents or aborted take-offs or landings have been reported yet. However, in worst-case scenario, Laser attacks can cause (Go around or, Loss of control in critical positions "LOC-I "or, Damage pilot's eyes).

As a response to that issue, I created a data base of laser beam attacks for 3 years. And as a sample, I started with the main three airports Alpha, Bravo and Charlie. Moreover, I interviewed a random sample of laser pens traders to know the different causes of the phenomenon. There were 230 reported incidents of laser illumination (218 at Alpha, 10 at Bravo, and 2 at Charlie airports) during the study period (3 years for Alpha and 2 years for bravo and Charlie. Total of 7 years), plus (16 dazzling lights, 4 fireworks. Plus 3 laser attacks on ATC Tower) on Alpha airport.

- Occurrence Register at Alpha airport during 3 years shown below:

Location Incident type	Arrival			On ground			TOWER CAP		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Laser Beam	126	60	32	3	NIL	1	1	1	1
Dazzling Light	12	2	2						
Intense Fireworks	1	NIL	3						

Table 1: Occurrence Register at Alpha Airport for 3 Years

- Occurrence Register at Bravo and Charlie airports during two years as shown below:

Location Incident type	Bravo		Charlie	
	Year 1	Year 2	Year 1	Year 2
Laser Beam	3	7	1	1

Table 2: Register at Bravo and Charlie Airports during 2 years

The main sources of laser are Hand held laser and outdoor Laser light shows inside clubs at night events.

We initiated a plan includes a variety of mitigation methods consists of control and recovery methods, with timetables, procedure for pilots and ATCOs (checklists), Moreover, training and active reporting system at Alpha airport, hazard identification, safety analysis, system gaps, and risk assessment. My study confirms ICAO results because the majority of attacks were during approach phase at Alpha airport during year one.

Finally, we may be able to gradually reduce number of laser-beam incidents, and reduce the severity of a laser beam event when it occurs. Laser incidents reduction percentage during 3 years was almost 70 %. Although, the target was 10% per year at Alpha airport.

PURPOSE

The purpose of this case study is to propose model for practical application by CAA to provide ATCO and pilot best practices (checklists). Applying ICAO protection zones by Plotting the LFFZ, LCFZ, and LSFZ at Alpha airport with AUTOCAD. Provide effective coordination between all stakeholders by establishing Local Laser Working Group (LLWG). How to manage and control risk by identifying hazards and assesse risk with Root cause and gap analysis. Establishing data base to provide trends for Alpha/Bravo/Charlie airports. Finally, to provide Mitigation Measures and Safety recommendations to achieve Safe operations at Alpha airport. Then rolling out the plan progressively to airports across country. As a start Charlie and Bravo Airports. Data provided in this case study may be used parallel with guidance materials provided by CAA to establish training campaign for pilots, awareness campaign for ATCO and Public awareness campaign. Also, it may be used as an oversight audit tool by CAA.

Chapter 1

RISK MANAGEMENT

1.1_ Causal Factor:

1. The lasers are too easily available at low cost, although it is illegal to aim a laser at an aircraft.
2. Laser pens are useful and fun, but they are all too often misused.
 - One is misuse by the general public.
 - Antisocial or criminal persons.
3. Beam diversion is very low. Laser beam often fills an entire cockpit at thousands of feet away.
4. People still do not understand how potentially dangerous this is.
5. Lack of awareness and training for pilot/ATCOs, lack of recovery methods.
6. Lack of proper procedure for pilots and ATCOs.
7. Insufficient regulations, laws.
8. Lack of coordination between different stakeholders.
9. Street sellers show off the power of laser pointers by pointing at an aircraft in front of the buyers/children to impress them with their products.
10. Use of lasers in outdoor light shows.

1.2 Hazard Identification:

1.2.1 Primary hazard:

1. Distraction.
2. Glare.
3. Temporary Flash blindness.
4. Eye injuries.

1.2.2 Methods:

A) Reactive:

- Safety reporting (service providers).

B) Proactive Hazard Identification Methods Through:

The proactive approach is required, so that the hazard is recognized and addressed before it could turn into an occurrence.

- Safety monitoring. (Data base for 3 years).
- Safety trends analysis. (ANSP) 3 years (Time, Location, Color, Type...).
- Safety assessment. (ANSP).
- Surveys.

1.2.3 Hazard Sources Identification:

The main sources of laser are:

- 1- Hand held laser and.
- 2- Laser light shows in clubs at night events.

1.3 Hazard Severity/Probability:

1.3.1 Hazard Consequence:

Laser attacks can cause:

- A- Go around or.
- B- Loss of control in critical positions "LOC-I".
- C- Temporarily damage pilot's vision.
- D- Collision with ground obstacle or aircraft.

1.3.2 Severity/Impact: (Who might be harmed?)

A-Effect on operations: may cause go around or loss of control or collision with an aircraft or ground obstacle.

B-Effect on aircrew: physical discomfort and increase in workload, and delay.

C-Effect on ATC service: slight increase in air traffic controller workload.

The criteria for determining the severity was (Phase of flight, Laser factors, beam environment, situational factor, pilot factor, operational factors, day or night ...) as illustrates below.

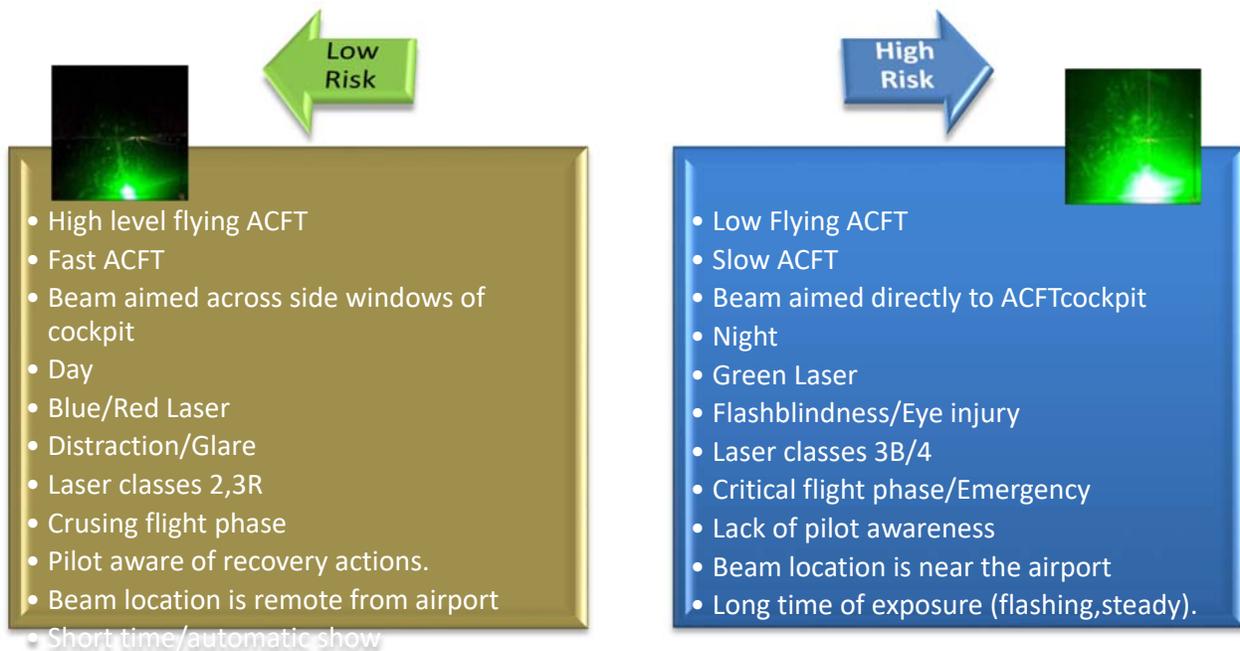


Figure 1: Factors Affecting Severity

1.3.3 Hazard probability:

The annual percentage of laser illumination did not cross 1% of all traffic at the three main airports. By the way these three airports represent approximately 60-70% of all country annual traffic.

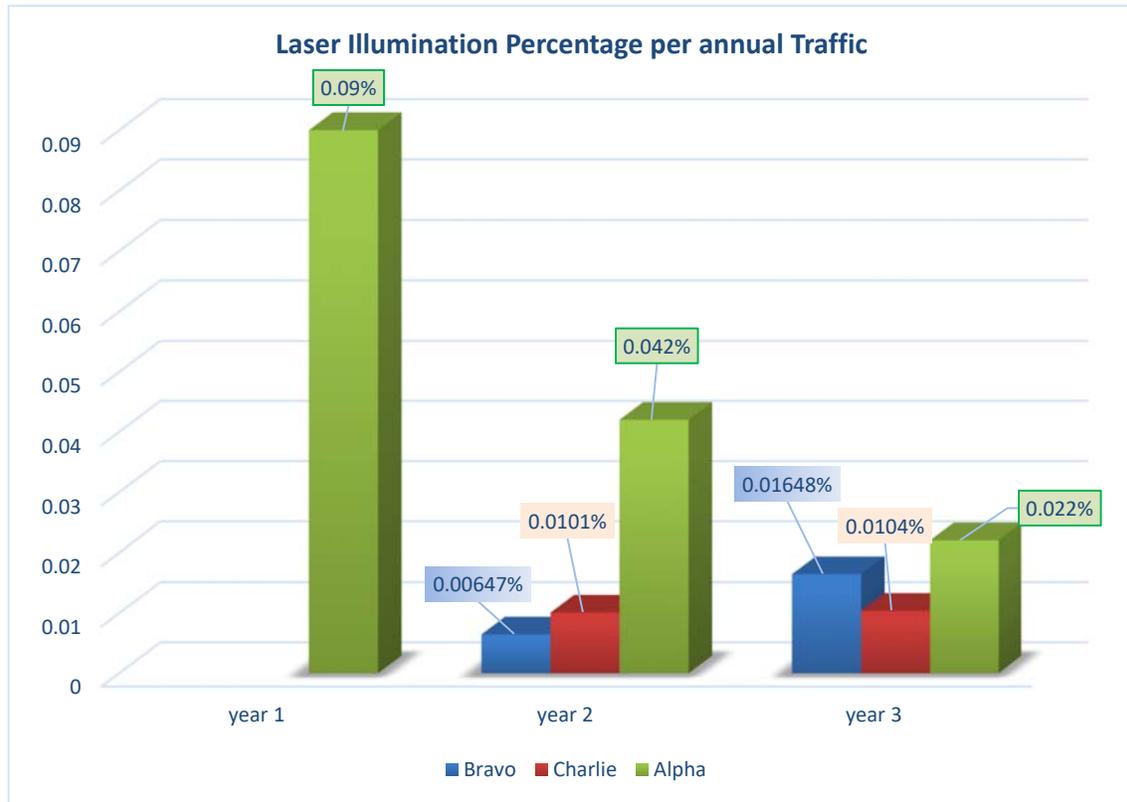


Figure 2: Laser Illumination Percentage per Annual Traffic during 3 Years at Alpha/Bravo/Charlie.

1.4 Risk Assessment at 3 Main Airports:

Risk probability	Risk severity					
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E	
Frequent 5	5A	5B	5C	5D	5E	Alpha 136 in year 1 64 in year 2 32 in year 3
Occasional 4	4A	4B	4C	4D	4E	
Remote 3	3A	3B	3C	3D	3E	Bravo 3 in Year 1 7 in Year 2
Improbable 2	2A	2B	2C	2D	2E	
Extremely improbable 1	1A	1B	1C	1D	1E	Charlie 1 in Year 1 1 in Year 2

Table 3: Risk Assessment at 3 Main Airports

- Alpha: Alpha airport. Bravo: Bravo Airport. Charlie: Charlie airport.

1.4.1 Risk Volume:

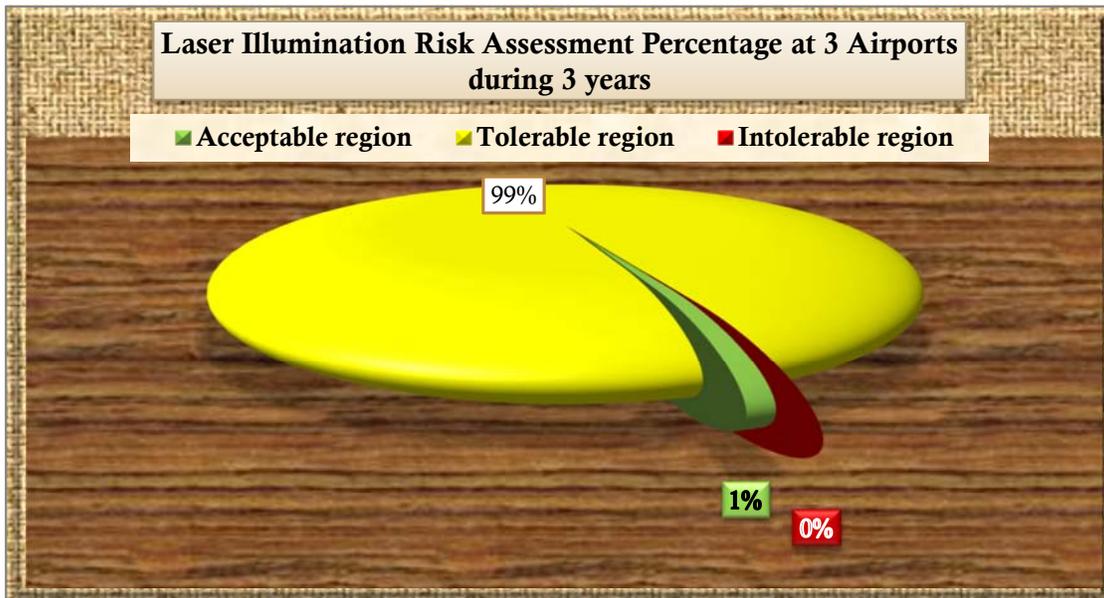


Figure 3: Risk Assessment Percentage in Egypt at 3 Main Airport during 3 years

- High risk or Intolerable risk= 0%, Tolerable risk= 99%, Acceptable risk =1% during 2013-2015.

1.5 Risk Control Strategy:

- ✓ Avoidance: ATC can avoid landing on high risk runways during events.
- ✓ Reduction: we cannot eliminate laser illumination risk. But we can mitigate it by several means. 99% of the problem in country can be mitigated by our mitigation measures below.
- ✓ Sharing Risk: share risk between (Aircraft Manufacturer, aircraft operator, Air Navigation Service Provider, and Civil Aviation Authority).

1.5.1 Control Measures: *(for more information see full mitigation measures page 35).*

- a) In the air: Pilots shall use laser beam checklist.
- b) On ground:
 - 1- ATC shall use ATC laser beam checklist after the first incident report.
 - 2- CAA shall terminate or increase beam divergence or change the direction of laser beam away from runways extensions during events.
 - 3- Restrict sale and import of laser beam class 3B, 4.
 - 4- Create new prevention law.

1.6 Fishbone Analysis:

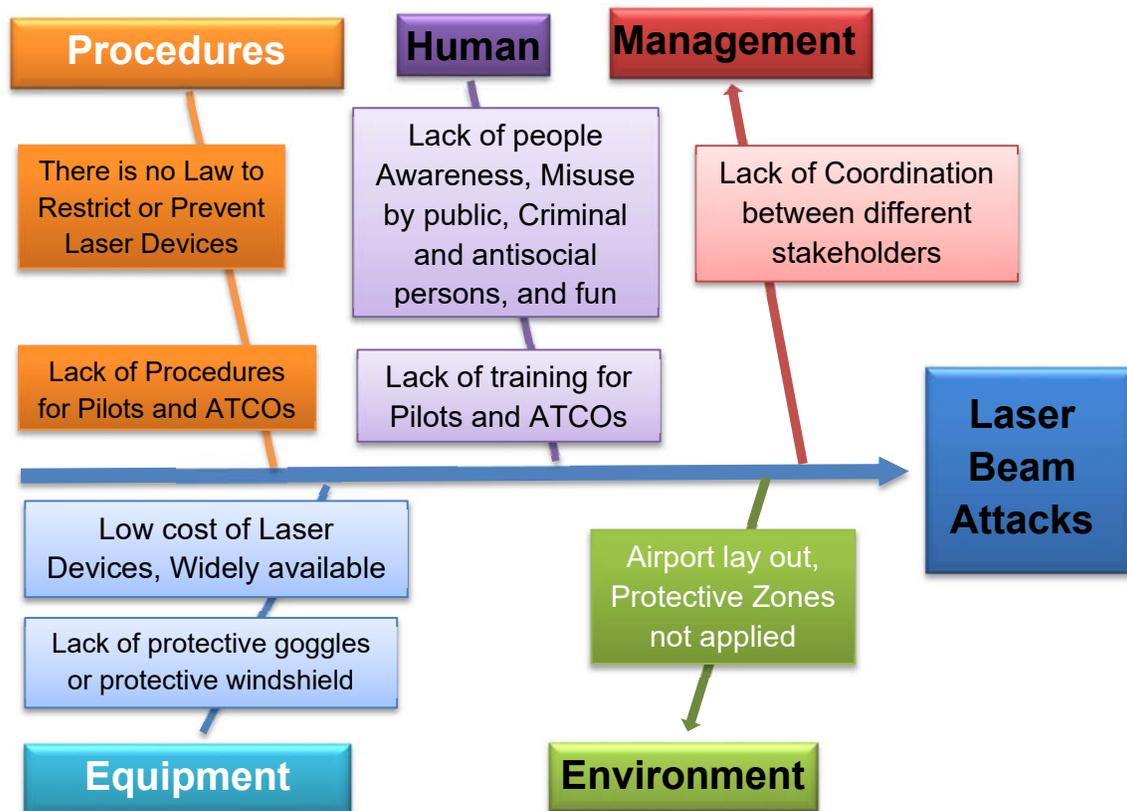


Figure 4: Fishbone Analysis

1.7 GAP Analysis in Reporting System:

- Part of pilots' community are respondent bias in reporting system.
- Police cannot catch laser attacker because there is no criminal law, more over lack of awareness for public and police.
- Pilots don't provide ATC with sufficient information about an incident report, which would include the location, direction, beam color, length of exposure (flash or intentional tracking), and effect on the crew, and laser location by GPS.
- There is no direct fast way of communication between pilots and police, public and police. Such as mobile applications, hot lines like 911.
- 9 questionnaires were initiated during year two and 13 questionnaires during year three as a survey by me (ATC).including the worst possible scenario, that equals almost half of incident during year three. That is why part of pilots' community are bias in reporting system.

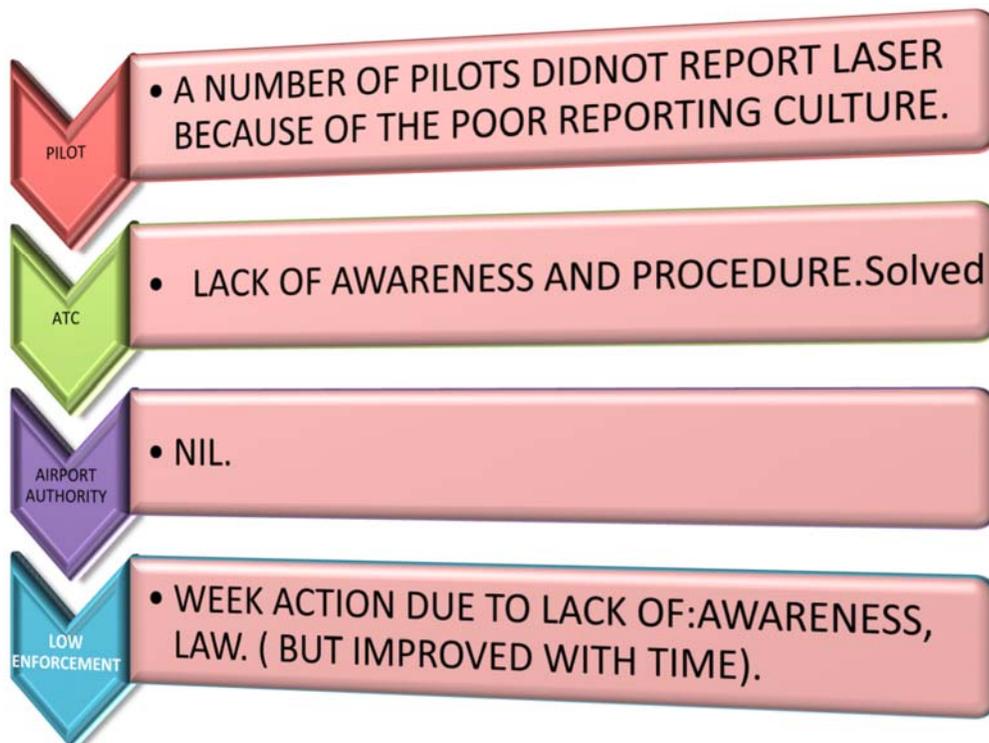


Figure 5: Gap Analysis in Reporting System

Chapter 2

ATCO & PILOT PROSPECTIVE PROCEDURES/BEST PRACTICES

2.1 Proposal for ATC Laser Check list

▪ ACTION BY ATCO	Yes	NO
1- Inform & update information to supervisor to relay information to CRISIS, APP...	<input type="checkbox"/>	<input type="checkbox"/>
2- Coordinate with APP (when pilot requests) to <u>Diverge</u> ACFT from the cleared flight path, or to use <u>different runway</u> or ask for <u>holding</u> until the area has been secured and the threat has ceased. Or restrict flying in a portion of airspace.	<input type="checkbox"/>	<input type="checkbox"/>
3-Use (<u>ATIS</u>) to warn incoming ACFT. Phrase " <i>UNAUTHORIZED LASER ILLUMINATION EVENT.</i> " + General positional location and altitude".	<input type="checkbox"/>	<input type="checkbox"/>
4- Cooperate with law enforcement officials investigating the event.	<input type="checkbox"/>	<input type="checkbox"/>
5- Report to safety office.	<input type="checkbox"/>	<input type="checkbox"/>
6- Issue NOTAM.	<input type="checkbox"/>	<input type="checkbox"/>

Table 4 Proposal for ATC Laser Check List

2.2 Tower Laser Beam Model

NO	A/C Call sign	Type	DEP	ARR	DME/ALT	RWY	Flight phase	Colour	Time	Date
1			<input type="checkbox"/>	<input type="checkbox"/>						
2			<input type="checkbox"/>	<input type="checkbox"/>						

Table 5 Tower Laser Beam Model

2.3 Proposal for Pilot Laser Checklist

▪ ACTION BY PILOTS	YES	NO
1- Look away and Shield eyes from the light source.	<input type="checkbox"/>	<input type="checkbox"/>
2- Use Laser protective eyewear	<input type="checkbox"/>	<input type="checkbox"/>
3- Background lights maximum on PM pilot's discretion.	<input type="checkbox"/>	<input type="checkbox"/>
4- COMMUNICATE with the other crewmember to determine visual condition and status of the aircraft.	<input type="checkbox"/>	<input type="checkbox"/>
5- Transfer control of the aircraft to another pilot.	<input type="checkbox"/>	<input type="checkbox"/>
6- ENGAGE autopilot and coupler for approach and manual landing.	<input type="checkbox"/>	<input type="checkbox"/>
7- If aircraft has auto-land capability, crew may elect to auto-land.	<input type="checkbox"/>	<input type="checkbox"/>
8- CONTACT ATC to report laser incident and request priority. If necessary, declare an emergency.	<input type="checkbox"/>	<input type="checkbox"/>
9- Avoid rubbing eyes. And seek medical help when required after landing.	<input type="checkbox"/>	<input type="checkbox"/>
10-ALLOW eyes to regain visual function and check aircraft instruments for any deviations from assigned flight profile when visual function returns.	<input type="checkbox"/>	<input type="checkbox"/>
11-Continue to CROSS CHECK and verify instrument indications for visual legibility during approach and landing.	<input type="checkbox"/>	<input type="checkbox"/>
12-DISENGAGE autopilot and coupler as per company policy	<input type="checkbox"/>	<input type="checkbox"/>
13-Manoeuvre or position the aircraft such that the laser beam no longer illuminates the flight deck. After coordination with ATC.	<input type="checkbox"/>	<input type="checkbox"/>
14- Ask ATC for different runway for landing.	<input type="checkbox"/>	<input type="checkbox"/>
15- Execute missed approach procedures.	<input type="checkbox"/>	<input type="checkbox"/>

Table 6 Proposal for Pilot Laser Checklist

Pilots Precautions:

1. Read laser NOTAMS of destination airport.
2. Expect Laser Activity during night operations. Especially during months (January, February, May, June), and hours from (16:00z to 23:59).
3. Expect Laser attacks during approach and Landing Phases and within LFFZ, LCFZ zones.

Chapter 3

TRENDS

3.1 Laser Attacks in MID Region per Year

3.1.1 Laser attacks reported at MID State Per year (Source: IATA)

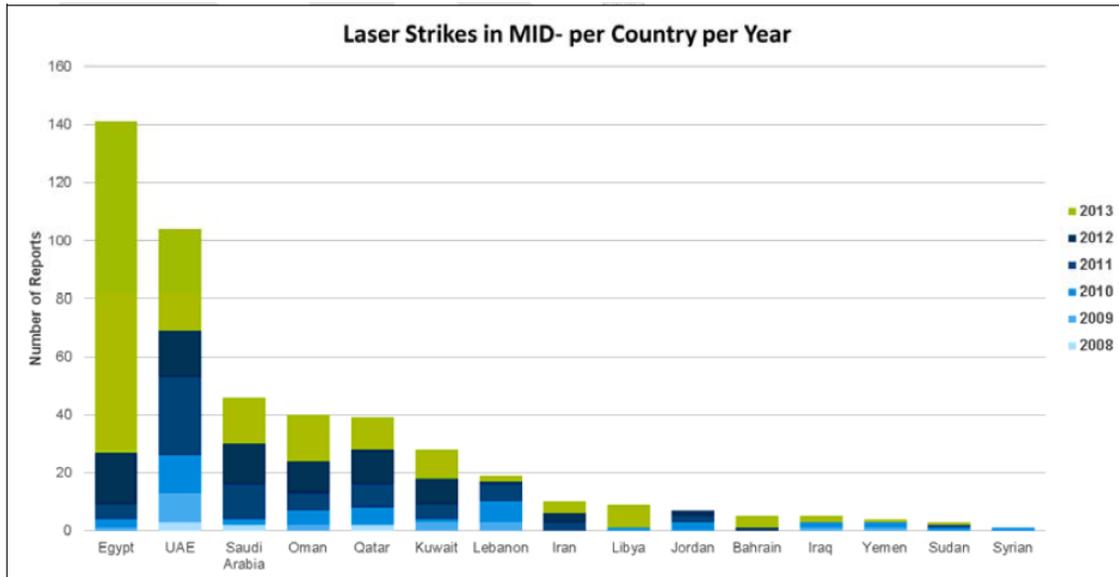


Figure 6: Laser Attacks Reported at MID State per Year (IATA)

3.1.2 Pie Chart 3 years comparison (Alpha airport):

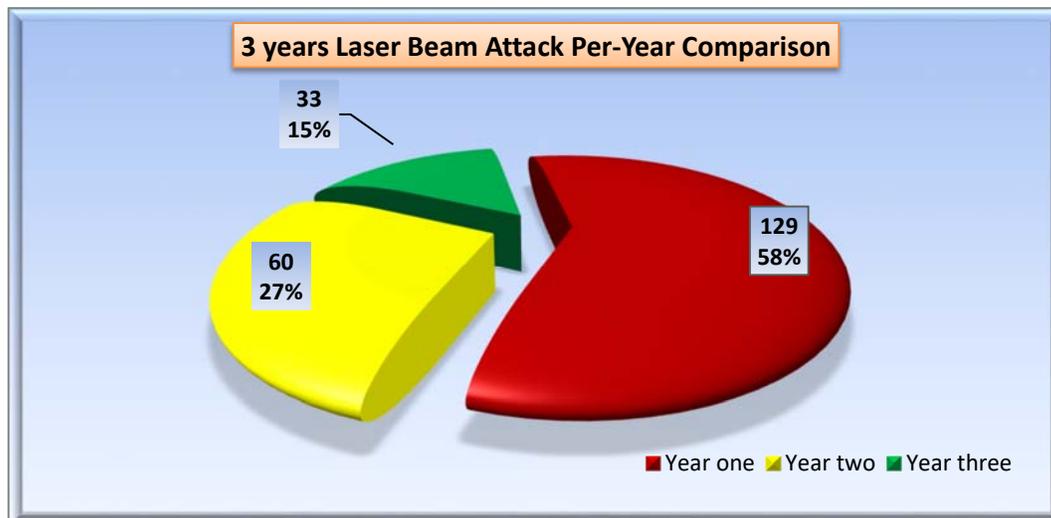


Figure 7: Pie Chart Comparison at Alpha Airport during 3 years

3.1.3 Laser Attacks Reduced to 15% during 2015 due to Several Reasons:

- A) Pilots and ATCO awareness.
- B) Few Pilots have PPE, or got proper training, and procedures. Like (KLM).
- C) ICAO meetings and seminars was very useful to highlight the importance of establishing database, etc.....
- D) Foreign airliners switches off exterior lights to avoid spotting by laser attackers (**Stealth mod**). Few pilots requested that from ATCO during final Approaches, although it is against normal procedures.
- E) A number of pilots did not report laser events (*Acceptance of risk as normal*). They think the risk is within accepted level. Moreover, some of them lost hope in solving this problem, In addition, they were attacked by laser for many years, and knew some recovery actions. Some pilots thinks it is a waste of time and effort, or it is not important to report incidents like laser illumination, and a quit number don't have *the safety reporting culture*.
- F) I noticed that during winter (December 2014), when temperature drops sharply and up normally, or during thick fog, we did not receive any reports of laser activity.
- G) Appling ICAO recommendations such as creating LLWG, this was the first step in identifying the risk and to help solving the problem.

3.1.4 Pie Chart during 2 Years Comparison (Bravo):

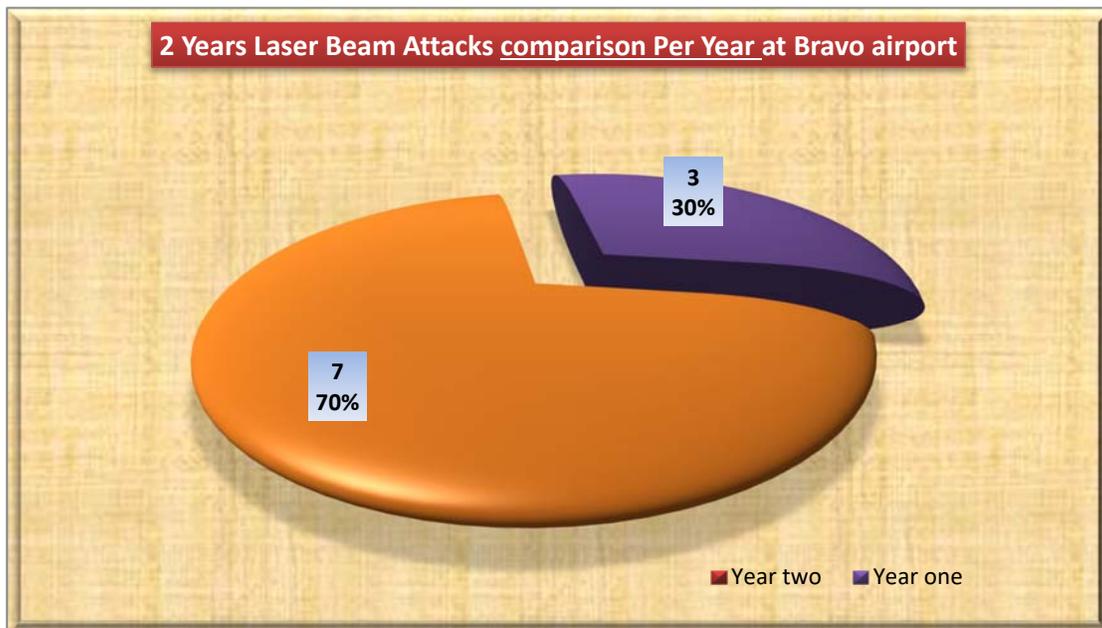


Figure 8: Bravo Laser Attacks Comparison during 2 Years

3.1.5 Pie Chart 2 Years Comparison (Charlie):

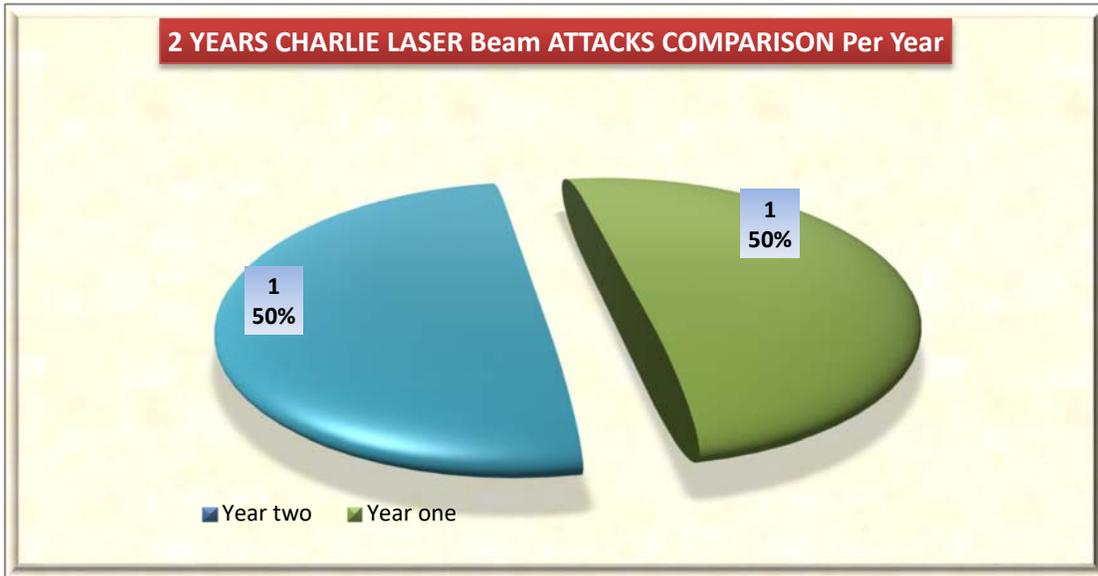
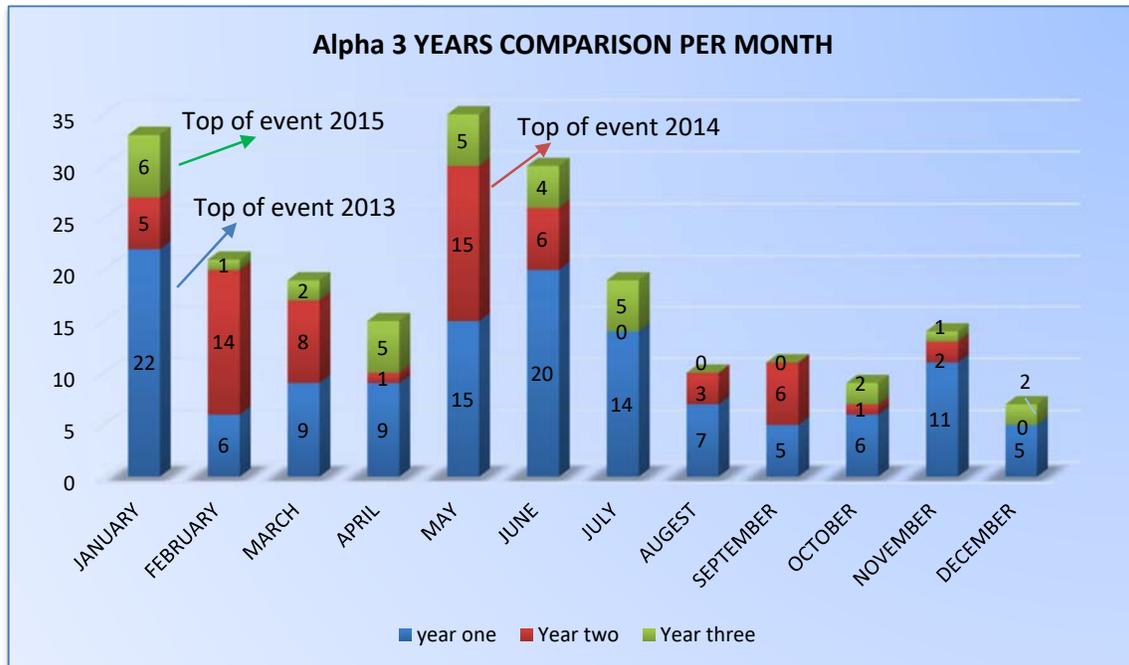


Figure 9: Pie Chart Comparison during 2 Years at Charlie Airport.

3.2_ Laser Attacks per Month:

3.2.1 Laser Attack Incidents (Per Month) Reported at Alpha Airport during 2



years.

Figure 10: Laser Attacks per Month at Alpha Airport

Top of events are during Official Holidays, summer holidays and National events.

1) Top of event were during January Year one and three, while it were during May year two.

* In my opinion, the numbers may be temporarily reduced, although laser attacks increase every year all over the world.

I think numbers will decrease after applying most of mitigation methods. However laser-beam incident severity will reduce quickly, by using Recovery methods like laser-beam best practices (Pilot/ATC checklists), and training campaigns.

3.2.2 Laser Attacks During Two Years at Bravo/Charlie Airports:

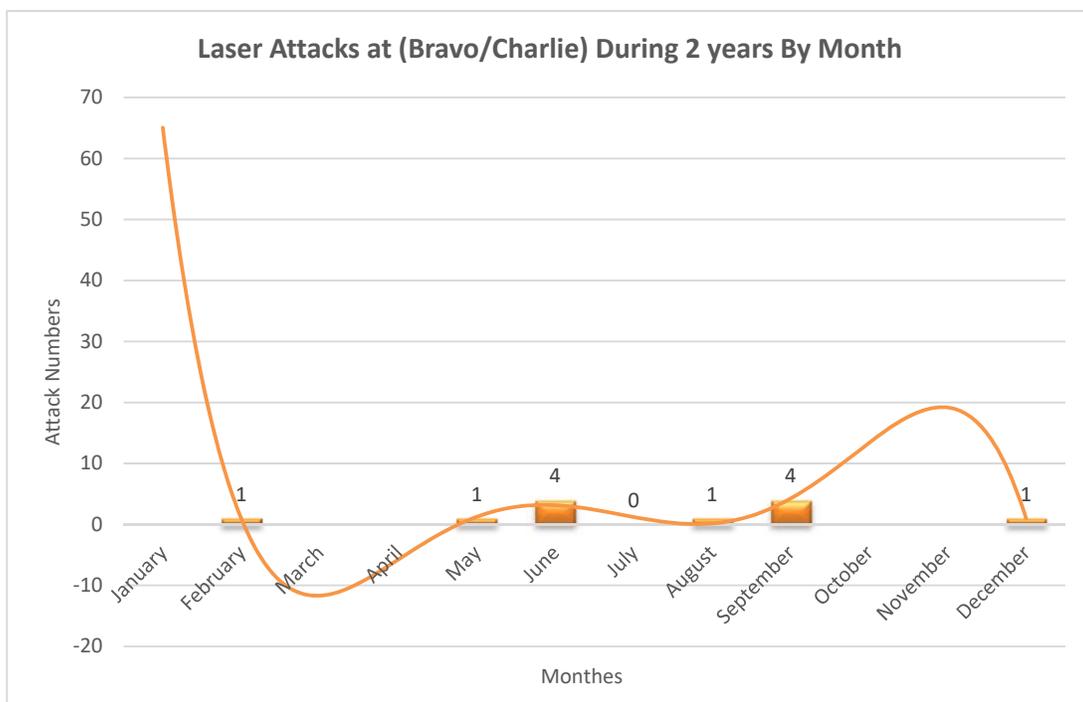


Figure 11: Laser Attacks per Month at Bravo/Charlie during 2 Years

Most of Laser attacks was during summer holidays. Top of events were during June and September.

3.3 Trend per Hour during 3 Years at Alpha Airport:

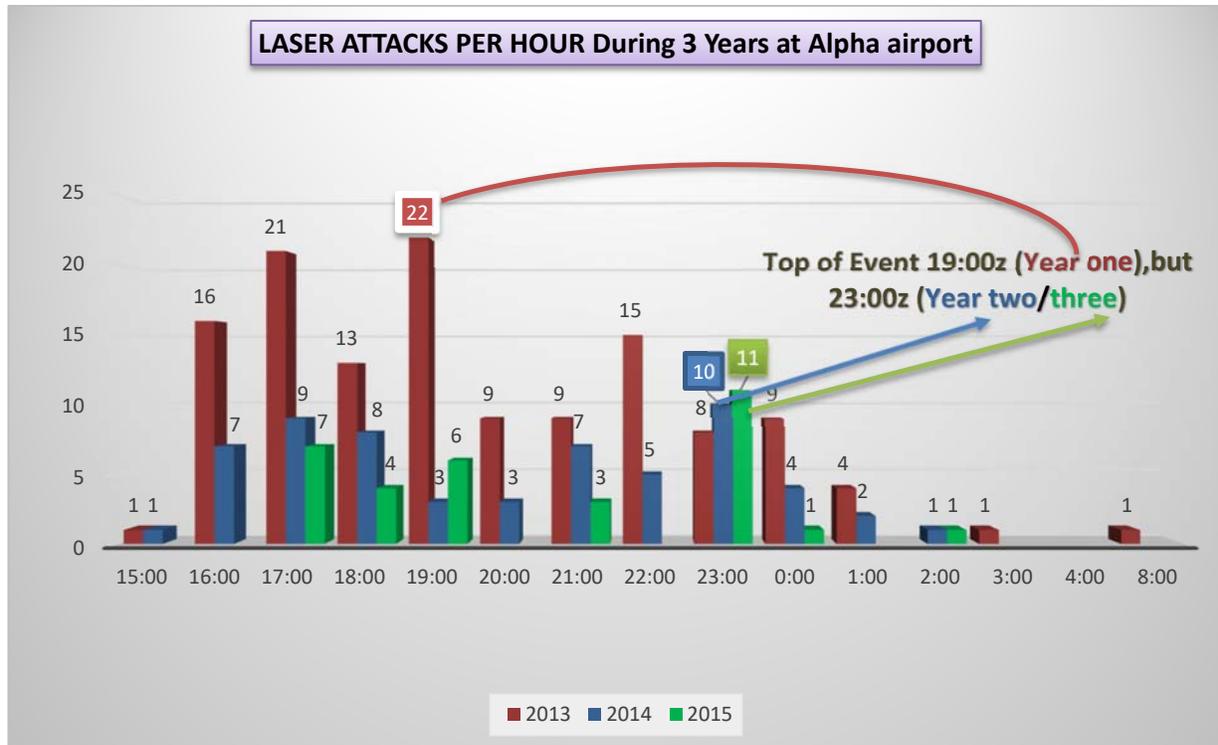


Figure 12: Laser Attacks per Hour at Alpha Airport during 3 Years

- A) Day vs. night: only one report at year one during day light hours, while 229 during night hours in the study period 3 years. Therefore, it is a **night event**.
- B) In addition, Top of event during year one happens at time: 19:00z, and starts to go down.
- C) Years two and three comparison: event starts at 16:00z almost end at 01:00z. And top of event for both years were 23:00z.
- D) Top of event at Charlie airport 16:21 z and 00:42 z.
- E) Top of event at Bravo airport 18:00 z and 19:50 z.

3.4 Laser illumination in relationship with the established ICAO zones:

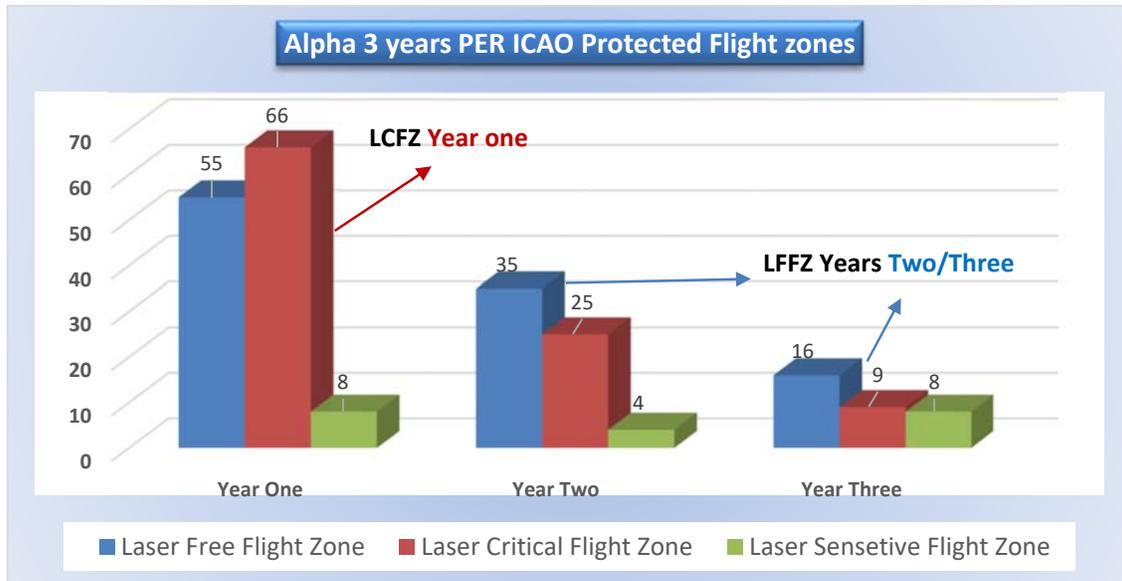


Figure 13: By Laser Protection Zones at Alpha Airport

3.4.1 Trend by ICAO laser Protection zones Alpha airport

- The dimensions are actual. Most attacks are in laser beam free flight zone 48% and laser critical flight zone 47%(during Year One).and as well 55% and 39% respectively during Year Two. And LFFZ was 48% and LCFZ was 27% during Year Three.
- Critical flight phases are within Laser Beam Free Flight Zone.
- LFFZ should have the priority when applying mitigation methods, Then LCFZ.
- The majority of attacks are in first two zones. LFFZ were 47%, LCFZ were 44% and LSFZ were 9 % during 3 Years. Therefore, we should concentrate our efforts on the Free flight zone, for getting fast results, achieving ALS and Implement effective methods for this specific area, by establishing layers of defence. And recovery plane for all stakeholders. Probability decreases in year two and three, but percentage increases at free flight zone.

3.5 Laser Attacks per Flight Phase:

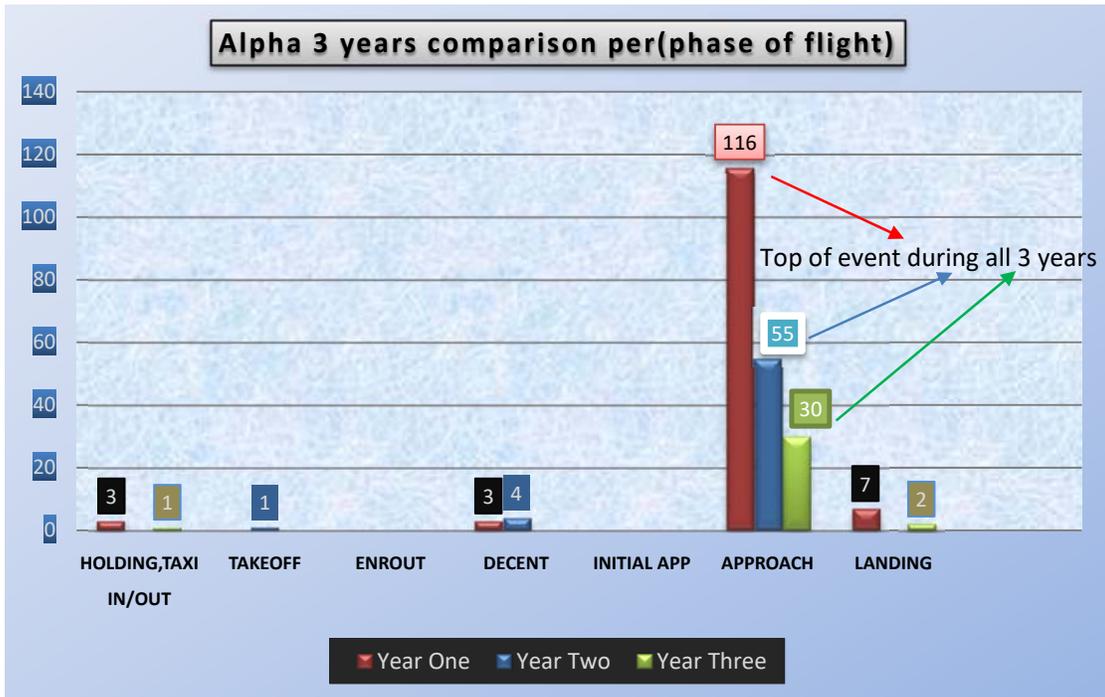


Figure 14: Flight Phase Comparison at Alpha Airport during 3 years

90.50%, of laser illumination occurred during approach, 4% during landing, and 3% during descent and 2% during holding and taxi, 0.5% during take-off. With 3 laser beam attacks on the tower cabin. There are no attacks during any other flight phases during study time 2013-2015.

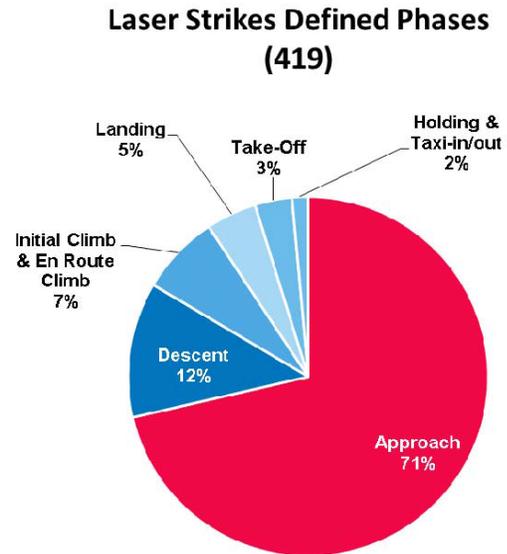


Figure 15: Laser Attacks per Flight Phase (Source IATA)

3.6 Trend for Laser Colour and Visual Effects:

A green laser is more of a visual hazard than an equivalent red or blue laser. Green laser presents 39% and Blue 1%, Unknown colour 50%, Dazzling light 6.5%, fireworks 1.5%, and attacks on Tower cabin with green laser 2%.

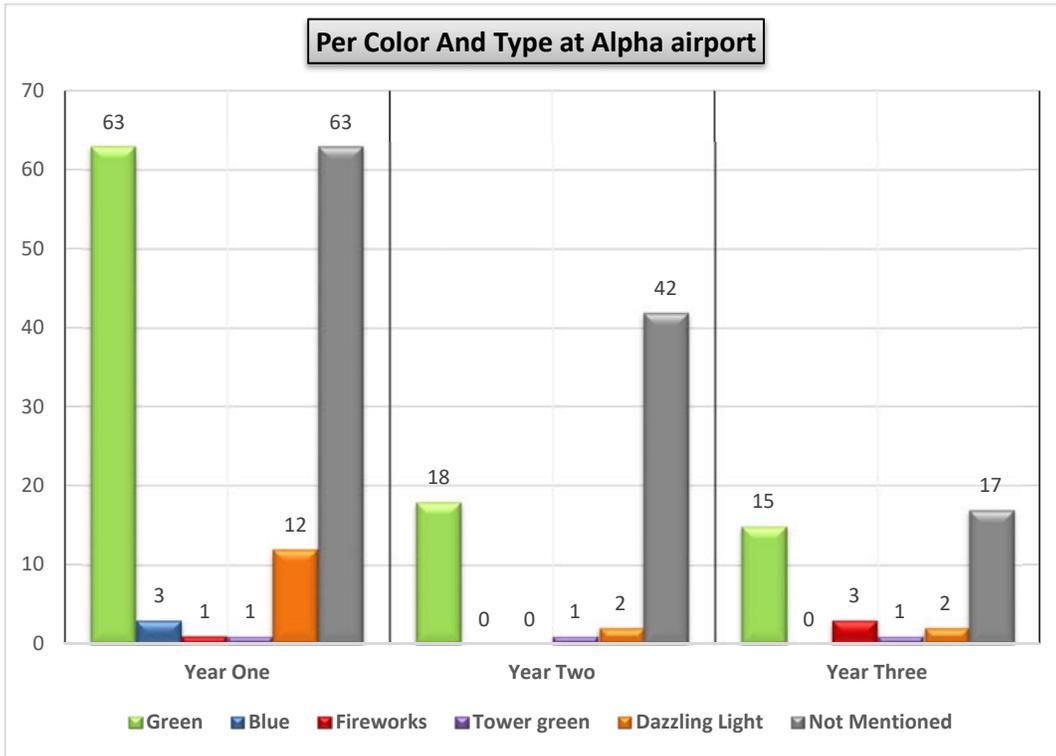


Figure 16: Laser Attacks per Color and Type at Alpha airport

3.6.1 Visual Effects and Hazard Distance by Colour:

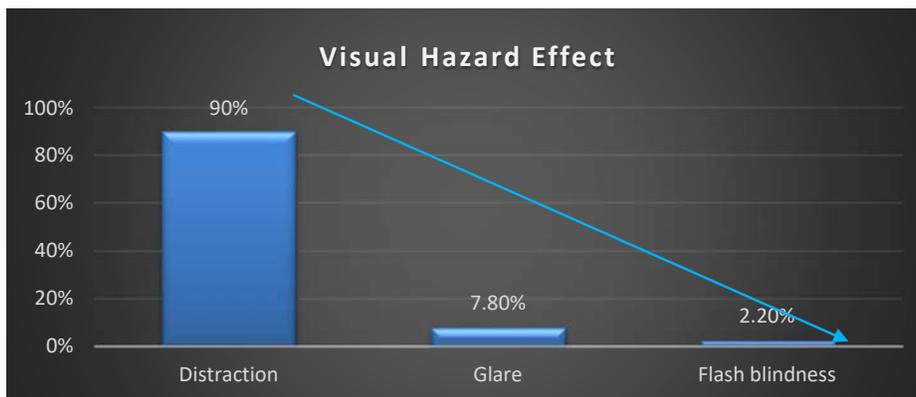


Figure 17: Visual Hazard Effect

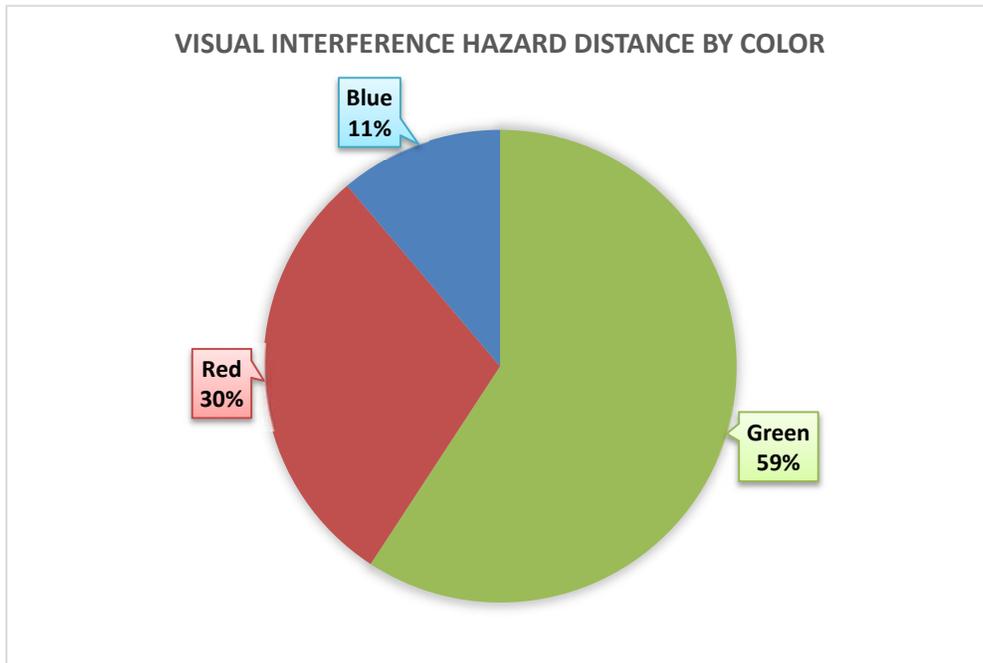


Figure 18: Visual Interference Hazard Distance by Color

The most common colour is the green colour, green has the longest visual interference hazard distance. With the great visual effects on pilot eyes, causing maximum distraction or glare or flash blindness.

3.7 CAA Control Methods:

CAA Shall control the ground bases responsible for laser night shows like clubs and ceremonies:

- 1- Having prior clearance.
- 2- Controlling laser beam directions (vertically and horizontally in degrees) to be away from runways centerlines extension.
- 3- Increasing diversion and output power or pulse energy of the beam to reduce visual hazard.
- 4- Terminating beams to protect critical airspace.

CHAPTER 4

Applying ICAO Protection Zones Dimensions on Airport Chart.

4.1 Plotting The LFFZ, LCFZ, And LSFZ At ALPHA Airport With AUTOCAD.

protected flight zones

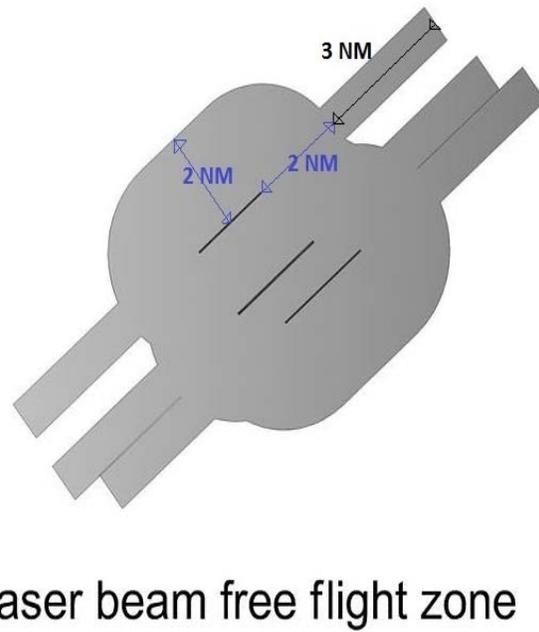
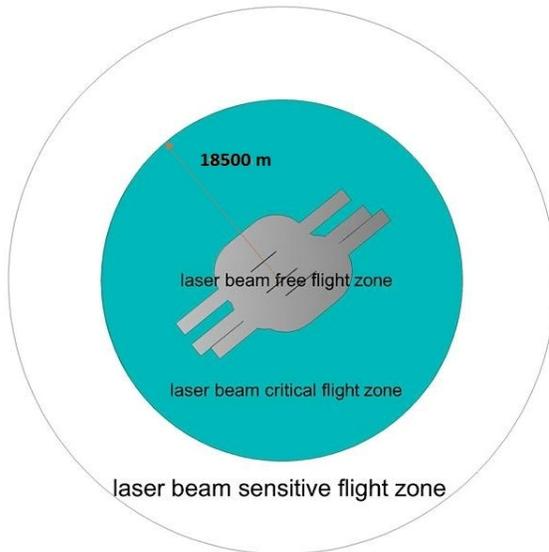


Figure 19: AUTOCAD Plotting the LFFZ, LCFZ and LSFZ Chart at Alpha Airport

Figure 20: LFFZ (Laser Free Flight Zone) Chart at Alpha Airport

4.2 Publish New Chart in National AIP

CHAPTER 5 COORDINATION

5.1. Management Coordination

- 1- Aerodrome managers.
- 2- Air traffic managers.
- 3- Local police organizations.

5.2. Local Laser Working Group (LLWG)

- Already Done by CAA, and This Study is a Product of Several Meetings during the last three years.
- A guidance material is provided parallel to this study.

Chapter 6

MITIGATION MEASURES:

A) Long term:

TECHNOLOGY:

- Aircraft manufactures should design new aircraft wind shield with new technology, to be reflection curved surface or diffuse reflection.

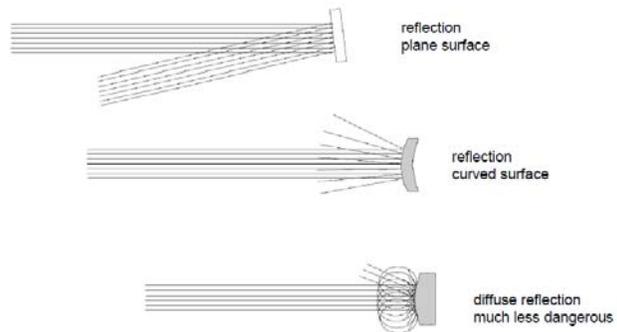


Figure 21: Proposed Reflected Wind Shield Design

PROCEDURES:

- **Curricula in schools** about the seriousness of the laser.
- Trade association: **Laser labeling:** manufacture voluntarily adds aircraft safety labels. , a warning statement or sheet.

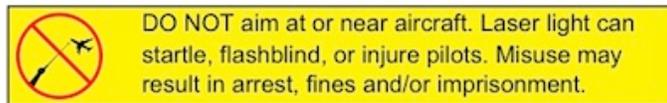


Figure 22: Laser Labeling

- **Stronger laws**, jail, for any one intentionally aiming at aircraft.
- **User education.** Via laser sellers' websites, manuals.
- **License** for outdoor laser activities, SOS...
- **Taxes:** Tax on consumer laser power. Tax laser pointers and handheld lasers at a rate significant enough to discourage casual purchases by the public, without making them unaffordable for persons who might need or want a laser for work or useful personal purposes. **It May be applied in future.**

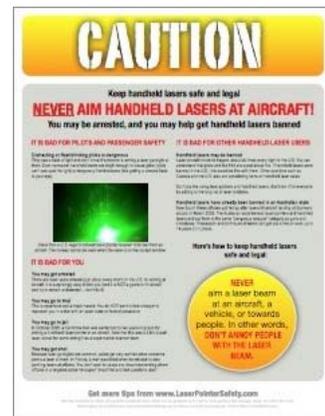


Figure 23: User Education Manual

- **Ban sales of Class 4 consumer lasers.**

B) Medium term:

Technology:

- **Emergency phone number** for reporting to local police department.
- Airbus invented a test windscreen anti-laser film for most common type of laser pointer, up to 2 m watts.

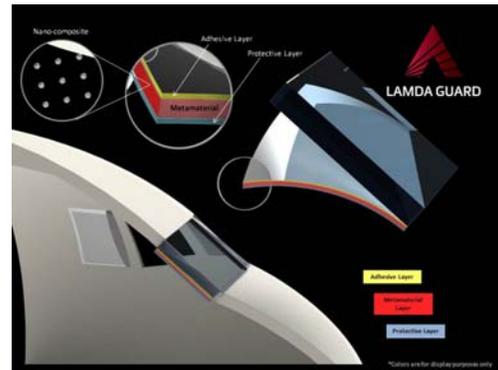


Figure 24: Anti-Laser Film (Nano Technology)

Procedures:

- **Laws restricting sale** and/or possession of consumer handheld lasers above a specified power level.

Training:

- **Pilots training.** FAA studies in a 737 simulator have shown that pilots often have trouble during their first exposure to laser light while simulating a tricky "short final" approach. However, success rates improve markedly after the second or third exposure. The pilots now know what to expect, and how to react. *Pilots are the "last line of defence".*



Figure 25: Simulation Training for Pilots

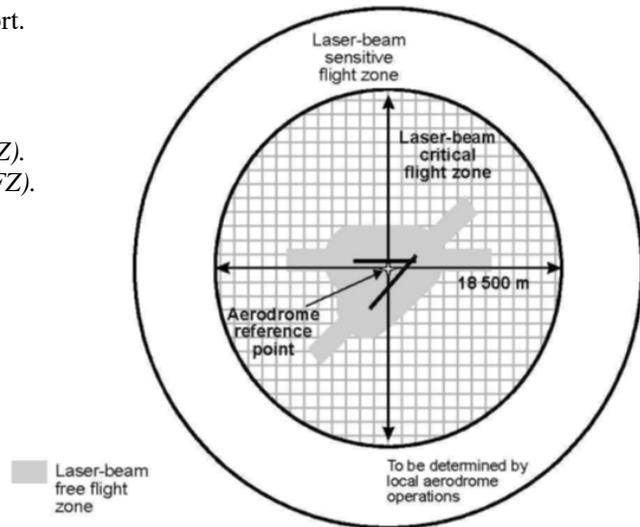
- **ATC training.**
- Undertake safety promotion activities to increase awareness and reporting.
- Public Awareness campaigns.

C) Short term:

Procedures:

- Newspapers and Media coverage of hazards, prohibitions.
- The extensive presence of police in specific places, for most of the attacks for rapid intervention.
- Laser warning Signs around the airport.
- Protection zones around the airport:

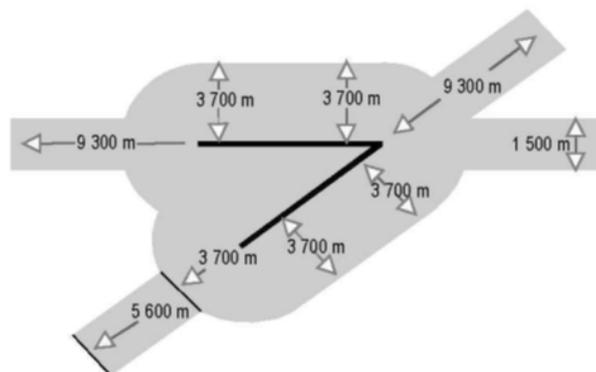
1. *Laser-beam free flight zone (LFFZ).*
2. *Laser-beam critical flight zone (LCFZ).*
3. *Laser-beam sensitive flight zone (LSFZ).*



Note.— The dimensions indicated are given as guidance only.

Figure 26: ICAO Protected Flight Zones

1. *Laser-beam free flight zone (LFFZ).*



Note.— The dimensions indicated are given as guidance only.

Figure 27: ICAO Laser Free Flight Zone (LFFZ) Dimensions

Technology:

- Make website for **pilots' reports** .to register reports at it.
- Send information to the **Civil Aviation Authority** via email to (email).
- Create a **mobile application** for (pilots and public) connected with **CAA website**. Enables them to report an event or request clearances for laser activity (clubs...).
- **Pilot goggles.**
Red goggles protects from blue and green laser beam. The other one protects from red laser beam.



Figure 28: Pilot Protection Goggles

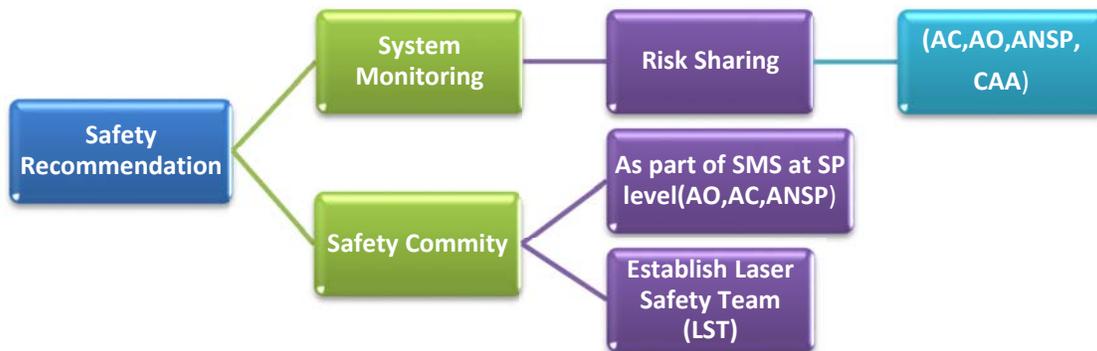
Precautions:

- Training for pilots shall include goggles manual.
- Never use goggles for the wrong laser!

Training:

- Public awareness campaign. (This technique can solve many aviation issues related to public (like FOD/Bird strike/Laser), by Applying it in the vicinity or airports at free flight zone only). It will achieve very good results in a very short time, by applying 1 to 2 minutes in every speech every week or month) (CAA should make awareness campaigns to get effective and fast results. and this solution will save more money in future.
- Using checklists to reduce the laser-beam incident severity and probability. For pilots and ATCO'S.

SAFETY RECOMMENDATION



- Start a Combined Training Campaigns for Pilots and Awareness Campaigns for ATCOs.
- Apply ICAO Protective Zones. And publish it in AIP.
- Survey for all aircraft operator to assess their capabilities (Procedures or checklists, Training, Safety reporting culture and Laser incidents record), and to provide further information.
- Assess the capability of the affected ATC facilities.
- Establish Database for system monitoring for national level (airports).
- Enhance the reporting mechanisms/systems at national level.
- Continues determination of contributing factors and root causes, in order to support the development of mitigation measures.
- Arranging coordination as soon as possible between all stakeholders.
- Insert ICAO Protective Zones (as a part of safeguarding) into future airports plans, and to be a part of airport certification. Before building any future airports.
- Issue annual NOTAMS for affected airports includes information about time, location and any available information about laser events.

CONCLUSION

Laser illumination is a safety and security concern. The annual percentage of laser illumination per all year traffic was less than 0.1%. We can reduce probability and severity of laser by different measures. Applying ICAO recommendation by establishing database helped us to identify hazard and to know how to control it. But after deep analysis, Gap analysis indicates that pilots are bias in reporting system. Moreover, I found that the results of risk assessment indicates the true size of the problem, if we managed to mitigate the tolerable incident reports, which were 99% of all incidents, and control the remaining by control measures and system monitoring, then we finally can reach Acceptable Level of Safety ALS. Pilots/ATCOs should have proper training including (visual effects, situational factors, operational factors, the impact on aircrew, and the main sources of laser, causal factors, how to recover and how to use best practices/checklists...).

Deep analysis enabled us to achieve fast results, Laser beam reported incidents were reduced by approximately 70% annually during the study period at Alpha airport. Top of event at Alpha airport happened during January and May at days Monday and Thursday at hours 19:00 Z, and 23:00 Z. The approach flight phase was the most affected phase of flight, it was more than 90%, and my results confirms IATA results in annual safety report 2014. Laser free flight zone (LFFZ) was the most affected zone after plotting incidents inside, which was approximately 50% of total incidents, we should start mitigating the LFFZ first to ensure safety and to get fast results. Green laser has the greatest visual effect, moreover, approximately 45% of reported incidents were green laser beam. The results of Applying laser beam incidents on google earth, were the concentration areas of laser beam attackers, thus, we can place police intervention around these places during top of event times. That is how we act proactively in the future, so that the hazard is recognized and addressed before it could turn into an occurrence.

Finally, the most effective control methods was ATC/Pilot checklists. And eventually, start phase three, to provide guidance materials. Moreover, phase four, to start a training campaign. Furthermore, phase five, audit by CAA. Furthermore, monitor the system, renew database and renew root cause analysis to support and develop new mitigation measures or corrective action plan if required.

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APPENDIX 3J

DIP Tracking for MID-RAST/RGS/7

Safety Topics Related to Ground Handling Services at the Aerodromes

RGS/7 DIP Deliverable	Target Date	Status	Comments
Advisory Circular on Apron Management Safety	Third Quarter of 2018	In Progress	Development of an Advisory Circular on Apron Management Safety, UAE is the lead supported by Egypt and Saudi Arabia.
<i>Seminar on Ground Handling Safety be organized and hosted by UAE</i>	First Quarter of 2019	Not started	A Seminar/Training on “Ground Handling Safety” to be hosted by UAE supported by ICAO, IATA and Ground Handlers.

APPENDIX 3K

STATUS OF AERODROME CERTIFICATION IMPLEMENTATION IN MID REGION						
	State	Number of Intl Aerodromes (AOP Table 1-1 -MID ANP)	Number of Certified Intl Aerodromes	Percentage Certified	List of Intl Aerodromes having Certificates	Remarks
1	Bahrain	1	1	100%	BAHRAIN/Bahrain Intl (OBBI)	
2	Egypt	7	5	71%	- CAIRO/Cairo Intl (HECA) - SHARM EL-SHEIKH/Sharm El Sheikh Intl (HESH) - HURGADA/Hurghada Intl (HEGN) - MARSALA ALAM /Marsa Alam Intl (HEMA) - ASWAN/Aswan Intl (HESN)	Certification of: - LUXER/Luxor Intl Airport (HELX) will be in Dec 2017 - ALEXANDRIA/Borg El-Arab Intl Airport (HEBA) will be in the first half of 2018
3	Iran	9	4	44%	- TEHRAN/Mehrabad Intl (OIII) - ZAHEDAN/Zahedan Intl (OIZH) - YAZD /Yazd Intl (OIYY) - ISFAHAN/Isfahan Int'l (OIFM)	Certification Status for: - TEHRAN/ IKIA Intl (OIIE) - BANDAR Abbas /Bandar Abbas Intl (OIKB) are waiting CAA final action for certification very soon
4	Iraq	6	2	33%	- BAGHDAD/Baghdad Intl (ORBI) - ERBIL/Erbil Intl (ORER)	

5	Jordan	3	2	67%	- AMMAN/Queen Alia Intl (OJAI) - AQABA/ King Hussein Intl (OJAQ)	
6	Kuwait	1	1	100%	KUWAIT/Kuwait Intl (OKBK)	
7	Lebanon	1	0	0%		
8	Libya	3	0	0%		
9	Oman	2	2	100%	- MUSCAT/Muscat Intl (OOMS) - SALALAH/Salalah (OOSA)	
10	Qatar	2	2	100%	- DOHA/Doha Intl (OTBD) - DOHA/Hamad Intl (OTHH)	
11	Saudi Arabia	4	4	100%	- DAMMAM/Kind Fahid Intl (OEDF) - JEDDAH/King Abdulaziz Intl (OEJN) - MADINAH/Prince Mohammad Bin Abdulaziz Intl (OEMA) - RIYADH/King Khalid Intl (OERK)	
12	Sudan	4	3	75%	- KHARTOUM/Khartoum (HSSS) - EL OBEID/EI Obeid (HSOB) - PORT SUDAN/Port Sudan	Certification of NYALA/Nyala (HSNN) Will be in January 2018

					(HSPN)	
13	Syria	3	0	0%		
14	UAE	8	8	100%	<ul style="list-style-type: none"> - ABU DHABI/Abu -Dhabi Intl (OMAA) - ABU DHABI/Al Bateen Intl (OMAD) - DUBAI/Dubai Intl (OMDB) - DUBAi/Al Maktoum Intl (OMDW) - AL AIN/Al Ain Intl (OMAL) - FUJAIRAH/Fujairah Intl (OMFJ) - RAS AL KHAIMAH/Ras Al Khaimah Intl (OMRK) - SHARJAH/Sharjah Intl (OMSJ) 	
15	Yemen	5	0	0%		
	Total Certified	59	34	58%		MID Region Safety Target 75% by end of 2017

APPENDIX 3L

Establishment of Runway Safety Teams (RSTs)
at International Aerodromes in the MID Region*(Updated September 2017)*

	State	Number of Int'l Aerodromes	Number of established Runway Safety Teams	List of Aerodromes having established Runway Safety Team
1	BAHRAIN	1	1	Bahrain/Bahrain Intl (OBBI)
2	EGYPT	7	4	- Cairo/Cairo Intl (HECA) - Sharm El Sheikh Intl (HESH) - Hurghada Int'l (HEGN) - Marsa Alam Intl (HEMA)
3	IRAN	9	6	- Tehran/Mehrabad Intl (OIII) - Tehran/ IKIA Intl (OIIE) - Zahedan/Zahedan Intl (OIZH) - Yazd /Yazd Intl (OIYY) - Isfahan/Isfahan Int'l (OIFM) - Bandar Abbas /Bandar Abbas Intl (OIKB)
4	IRAQ	6		
5	JORDAN	3	1	- Aqaba/King Hussein Intl (OJAQ)
6	KUWAIT	1	1	Kuwait/Kuwait Intl (OKBK)
7	LEBANON	1		
8	LIBYA	3		
9	OMAN	2	2	- Muscat/Muscat Intl (OOMS) - Salalah/Salalah (OOSA)
10	QATAR	2	2	- Doha/Doha Intl (OTBD) - Doha/Hamad Intl (OTHH)

	State	Number of Int'l Aerodromes	Number of established Runway Safety Teams	List of Aerodromes having established Runway Safety Team
11	SAUDI ARABIA	4	4	- Dammam/King Fahad Intl (OEDF) - Jeddah/King Abdulaziz Intl (OEJN) - Riyadh/King Khalid Intl (OERK) - Madinah/Prince Mohammad Bin Abdulaziz Intl (OEMA)
12	SUDAN	4	4	- Khartoum/Khartoum (HSSS) - El Obeid/El Obeid (HSOB) - Port Sudan/Port Sudan (HSPN) - Nyala/Nyala (HSNN)
13	SYRIA	3		
14	UNITED ARAB EMIRATES- UAE	8	8	- Abu Dhabi/Abu -Dhabi Intl (OMAA) - Abu Dhabi/Al Bateen Intl (OMAD) - Dubai/Dubai Intl (OMDB) - Dubai/Al Maktoum Intl (OMDW) - Al Ain/Al Ain Intl (OMAL) - Fujairah/Fujairah Intl (OMFJ) - Ras Al Khaimah/Ras Al Khaimah Intl (OMRK) - Sharjah/Sharjah Intl (OMSJ)
15	YEMEN	5		

**Total
Percentage**

59

**33
56%**

APPENDIX 3M

STATUS OF IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEM (SMS)
AT INTERNATIONAL AERODROMES IN THE MID REGION

	State	Number of State Int'l Aerodromes	Number of Aerodrome implemented SMS	Challenges/Difficulties	Improvement and Priorities
1	BAHRAIN	1	1		
2	EGYPT	7	5		
3	IRAN	9	4		
4	IRAQ	6	2		
5	JORDAN	3	2		
6	KUWAIT	1	1		
7	LEBANON	1	0		
8	LIBYA	3	0		
9	OMAN	2	2		
10	QATAR	2	2		
11	SAUDI ARABIA	4	4		
12	SUDAN	4	3		
13	SYRIA	3	0		
14	UNITED ARAB EMIRATES- UAE	8	8		
15	YEMEN	5	0		
	Total	59	34		

APPENDIX 3N

STATUS OF THE MID REGION SAFETY INDICATORS TARGETS

	Safety Indicator	Safety Targets	MID Average Rate 2012-2016	Global Average Rate 2012-2016	MID 2016	Global 2016
Reactive Part	Number of accidents per million departures.	Reduce/Maintain the regional average rate of accidents to be in line with the global average rate by 2016.	2.76	2.76	2.3	2.1
	Number of fatal accidents per million departures.	Reduce/Maintain the regional average rate of fatal accidents to be in line with the global average rate by 2016.	0.64	0.26	1.54	0.26
	Number of Runway Safety related accidents per million departures.	Reduce/Maintain the regional average rate of Runway Safety related accidents to be below the global average rate by 2016.	1.39	1.48	1.54	1.23
		Reduce/Maintain the Runway Safety related accidents to be less than 1 accident per million departures by 2016.	2			
	Number of LOC-I related accidents per million departures.	Reduce/Maintain the regional average rate of LOC-I related accidents to be below the global rate by 2016.	0	0.07	0	0.1
	Number of CFIT related accidents per million departures.	Reduce/Maintain the regional average rate of CFIT related accidents to be below the global rate by 2016.	0	0.08	0	0.04

	Safety Indicator	Safety Target	MID
Proactive Part	USOAP-CMA Effective Implementation (EI) results: a. Regional average EI. b. Number of MID States with an overall EI over 60%. c. Number of MID States with an EI score less than 60% for more than 2 areas (LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA).	Progressively increase the USOAP-CMA EI scores/results: a. Increase the regional average EI to be above 70% by 2020. b. 11 MID States to have at least 60% EI by 2020. c. Max 3 MID States with an EI score less than 60% for more than 2 areas by 2017.	a. 70.5% b. 10 States c. 7 States
	Number of Significant Safety Concerns.	a. MID States resolve identified Significant Safety Concerns as a matter of urgency and in any case within 12 months from their identification. b. No significant Safety Concern by end of 2016.	None
	Use of the IATA Operational Safety Audit (IOSA), to complement safety oversight activities.	a. Maintain at least 60% of eligible MID airlines to be certified IATA-IOSA by 2015 at all times. b. All MID States with an EI of at least 60% use the IATA Operational Safety Audit (IOSA) to complement their safety oversight activities, by 2018.	a. 57% b. 4 States
	Number of certified international aerodrome as a percentage of all International Aerodromes in the MID Region.	a. 50% of the International Aerodromes certified by 2015. b. 75% of the International Aerodromes certified by 2017.	58%
	Number of established Runway Safety Team (RST) at MID International Aerodromes.	50% of the International Aerodromes by 2020.	56%
	Percentage of MID States that use ECCAIRS for the reporting of accidents and serious incidents.	a. 60% by 2018 b. 80% by 2020	27% already using ECCAIRS 13% Planning to use ECCAIRS in 2017

	Safety Indicator	Safety Target	MID
Predictive Part	Number of MID States, having completed the SSP Gap Analysis on iSTARS.	10 MID States by 2015.	10 States
	Number of MID States that have developed an SSP implementation plan.	10 MID States by 2015.	8 States
	Number of MID States with EI>60%, having completed implementation of SSP Phase 1.	All MID States with EI>60% to complete phase 1 by 2016.	3 States completed implementation of SSP Phase 1. 4 States partially completed implementation of SSP Phase 1.
	Number of MID States with EI>60%, having completed implementation of SSP Phase 2.	All MID States with EI>60% to complete phase 2 by 2017.	1 State completed implementation of SSP Phase 2. 6 States partially completed implementation of SSP Phase 2.
	Number of MID States with EI>60%, having completed implementation of SSP Phase 3.	All MID States with EI>60% to complete phase 3 by 2018.	7 States partially completed implementation of SSP Phase 3.
	Number of MID States with EI>60%, having completed implementation of SSP.	All MID States with EI>60% to complete SSP implementation by 2020.	None
	Number of MID States with EI>60% that have established a process for acceptance of individual service providers' SMS.	a. 30% of MID States with EI>60% by 2015. b. 70% of MID States with EI>60% by 2016. c. 100% of MID States with EI>60% by 2017.	6 States established a process for acceptance of individual service providers' SMS.
	*Average Fleet Age.	States are required to monitor their fleet age.	N/A
	*Percentage of fleet above 20 years of age.	No regional Safety Targets are defined.	

MID ACCIDENTS (2012 - 2016) related to Runway Safety

#	Date	Aircraft Type	State of Occurrence	Fatalities	Accident Category	Root Causes and Contributing Factors	Safety Recommendation
	3/8/2016	Boeing 777	UAE	1	RS		
	19/05/2016	Airbus A320	Egypt	66	UNK		
	28/01/2016	MCDONNELL DOUGLAS	Iran		RS		
	13/9/2015	Airbus A380	UAE	-	TURB		
	15/10/2015	Boeing 747	Iran	-	SCF		
	31/10/2015	Airbus A321	Egypt	224	UNK		
	5/1/2014	Boeing 767	Saudi Arabia	-	RS		
	17/2/2014	Airbus A321	UAE	-	RS		
	10/5/2014	Fokker	Iran	-	RS		
	10/8/2014	Antonov 140	Iran	38	SCF		
	23/10/2014	Airbus A330	UAE	-	OTH		
	11/2/2013	Boeing 737	Oman	-	SCF		
	28/4/2013	Boeing 777	Saudi Arabia	-	RS		
	6/8/2013	Fokker 727	Sudan	-	RS		
	29/3/2012	Fokker 50	Sudan	-	RS		
	20/9/2012	Airbus A320	Syria	-	OTH		

APPENDIX 4A

B0 – ACDM: Improved Airport Operations through Airport-CDM

Description and purpose

To implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport. This will improve surface traffic management reducing delays on movement and manoeuvring areas and enhance safety, efficiency and situational awareness.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	Y	N

Applicability consideration:

Local for equipped/capable fleets and already established airport surface infrastructure.

B0 – ACDM: Improved Airport Operations through Airport-CDM

<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>
A-CDM	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented improved airport operations through airport-CDM Supporting metric: Number of applicable international aerodromes having implemented improved airport operations through airport-CDM	40% by Dec. 2017

TABLE B0-ACDM

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
- 2 Name of City/Aerodrome and Location Indicator
- 3 Status of implementation of Apron Management, where:
Y – Yes, implemented
N – No, not implemented
- 4 Status of implementation of ATM-Aerodrome coordination, where:
Y – Yes, implemented
N – No, not implemented
- 5 Terminal & runway capacity is declared, where:
Y – Yes, declared
N – No, not declared
- 6 Action plan — short description of the State’s Action Plan with regard to the implementation of B0-ACDM.
- 7 Remarks

State	City/ Aerodrome Location Indicator	Apron Management	ATM-Aerodrome Coordination	Terminal & runway capacity declared	Action Plan	Remarks
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
BAHRAIN	Bahrain/Bahrain Intl (OBBI)	N	N	N	2018	
EGYPT	Cairo/Cairo Intl (HECA)	N	N	N	2018-2019	
IRAN	Tehran/Mehrabad Intl (OIII)	N	N	N		
KUWAIT	Kuwait/Kuwait Intl (OKBK)	N	N	N		
OMAN	Muscat/Muscat Intl (OOMS)	N	N	N		
QATAR	Doha/Doha Intl (OTBD)	N	N	N		
QATAR	Doha/Hamad Intl (OTHH)	N	N	N		
SAUDI ARABIA	JEDDAH/King Abdulaziz Intl (OEJN)	N	N	N		
SAUDI ARABIA	RIYADH/King Khalid Intl (OERK)	N	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	Y	Y	Y	2017	Final Operational test Q4 2017 Full implementation Q1 2018
UAE	Dubai/Dubai Intl (OMDB)	Y	Y	Y	2017	
UAE	DUBAI/Al Maktoum Intl (OMDW)	N	N	N	No	No operational requirement
Total Percentage						

APPENDIX 4B

B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)

Description and purpose

Basic A-SMGCS provides surveillance and alerting of movements of both aircraft and vehicles on the aerodrome thus improving runway/aerodrome safety. ADS-B information is used when available (ADS-B APT).

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	Y

Applicability consideration:

A-SMGCS is applicable to any aerodrome and all classes of aircraft/vehicles. Implementation is to be based on requirements stemming from individual aerodrome operational and cost-benefit assessments. ADS-B APT, when applied is an element of A-SMGCS, is designed to be applied at aerodromes with medium traffic complexity, having up to two active runways at a time and the runway width of minimum 45 m.

<i>B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)</i>			
Elements	<i>Applicability</i>	Performance Indicators/Supporting Metrics	Targets
A-SMGCS Level 1*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 1 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 1	70% by Dec. 2017
A-SMGCS Level 2*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 2 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 2	50% by Dec. 2017

*Reference: Eurocontrol Document – “Definition of A-SMGCS Implementation Levels, Edition 1.2, 2010”.

TABLE B0-SURF (A-SMGCS Level 1-2)

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
- 2 Name of City/Aerodrome and Location Indicator where A-SMGCS is required
- 3 Status of implementation of A-SMGCS Level 1, where:
Y – Yes, implemented
N – No, not implemented
- 4 Status of implementation of A-SMGCS Level 2, where:
Y – Yes, implemented
N – No, not implemented
- 5 Action plan — short description of the State’s Action Plan with regard to the implementation of A-SMGCS Level 1-2, especially for items with “N”.
- 6 Remarks - additional information (e.g. case of difference between level 1 and level 2 applicability)

State	City/ Aerodrome Location Indicator	Level 1	Level 2	Action Plan	Remarks
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
BAHRAIN	Bahrain/Bahrain Intl (OBBI)	N	N	A-SMGCS Level 1, 2 Projects is under execution phase. Expected completion on Dec 2018	
EGYPT	Cairo/Cairo Intl (HECA)	Y	Y		
IRAN	Tehran/Mehrabad Intl (OIII)	N	N		
KUWAIT	Kuwait/Kuwait Intl (OKBK)	N	N		
OMAN	Muscat/Muscat Intl (OOMS)	N	N		
QATAR	Doha/Doha Intl (OTBD)	Y	Y		
QATAR	Doha/Hamad Intl (OTHH)	Y	Y		
SAUDI ARABIA	Dammam/King Fahad Intl (OEJN)	N	N		
SAUDI ARABIA	JEDDAH/King Abdulaziz Intl (OEJN)	N	N		
SAUDI ARABIA	RIYADH/King Khalid Intl (OERK)	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	Y	Y	Level 4 -2017	
UAE	Dubai/Dubai Intl (OMDB)	Y	Y	Level 4 – 2016 (implemented)	
UAE	DUBAI/Al Maktoum Intl (OMDW)	Y	Y	Level 4 - 2018	
Total Percentage		46%	46%		

APPENDIX 5A

Deficiencies in the AOP Field

BAHRAIN

Item No	Identification		Deficiencies			Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination	Description	Executing Body	Date of Completion	Priority for Action
No Deficiencies Reported									

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

EGYPT

Item No	Identification		Deficiencies			Corrective Action				
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination	Description	Executing Body	Date of Completion	Priority for Action	
1	MID eANP VOL II Table AOP II 1	Alexandria Int'l Airport	Runway is short and current distance is 7221 FT with runway all up weight maximum 68000kgs	Jul, 2004	-	F O	Upgrade for RWY 04/22 is done, study is carried out with conclusion of MTOW 72000 Kg commensurate the demand aircraft fleet mix serve at the airport taking into consideration the current Rwy characteristics (Length, PCN)	Egypt	Jul, 2018	A
2	ANNEX 14 VOL I: Para. 1.4	Luxor and Borg El Arab Intl. Airports	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	Certification of: - LUXER/Luxor Intl Airport (HELX) will be in Dec 2017 - ALEXANDRIA/ Borg El-Arab Intl Airport (HEBA) will be in the first half of 2018	F H	State submitted a letter dated 22/07/2015 stating that all primary international aerodromes will be certified by the end of November 2018.	Egypt	Nov, 2018 Jun, 2018	A

(1) Rationale for non-elimination: "F"= Financial

"H"= Human Resources

"S"= State (Military/political)

"O"= Other unknown causes

Deficiencies in the AOP Field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Imam Khomeini, Mehrabad, Mashhad, Yazd and Tabriz Intl. Airports - MASHHAD/Sh ahid Hashemi Nejad Intl (OIMM), SHIRAZ/Shiraz Intl (OISS), TABRIZ/Tabriz Intl (OITT), TEHRAN/Imam Khomeini Intl (OIIE), BANDAR ABBAS/Bandar Abbas Intl (OIKB)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	Certification Status for: - TEHRAN/ IKIA Intl (OIIE) - BANDAR Abbas /Bandar Abbas Intl (OIKB) are waiting final action for certification very soon	F H	Corrective Action Plan has not been formally provided by the State	Iran	Dec, 2018	A

(1) Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Baghdad/ Basrah/ Erbil /Sulaymaniyah/ Al Najaf Intl. Airports Al Najaf/Al Najaf Intl (ORNI), BASRAH/Basrah Intl (ORMM), MOUSL/Mousl Intl (ORBM), SULTYMANIYA H/Sulaymaniyah Intl (ORSU)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A

(1) Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

JORDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table AOP II 1	Queen Alia Airport Runway 08L/26R	Runway is not operational and closed since long time	Dec, 2014	construction handing over	F	Corrective Action Plan has not been formally provided by the State	Jordan	Dec, 2018	B
					Runway 26R I DBL is operational since 14/09/2017 as an instrument runway for departures only; arrival profiles and approach procedures CAT II are published and will be effective on 7/12/2017. The runway operates in a trial period for 180 calendar days starting from 14/09/2017.					
2	ANNEX 14 VOL I: Para. 1.4	Marka Intl Airport AMMAN/Marka Intl Airport	Implementation of Certification of Aerodromes used for international operations	May, 2015	State sent a letter to ICAO MID Office dated 21 Nov.2017 Designated Marka Airport as a General Aviation Airport, and requested its removal of form MID eANP AOP Table	F H	Corrective Action Plan has not been formally provided by the State	Jordan	Dec, 2017 Mar, 2018	A

(1) Rationale for non-elimination: "F"= Financial

"H"= Human Resources

"S"= State (Military/political)

"O"= Other unknown causes

Deficiencies in the AOP Field

KUWAIT

Item No	Identification		Deficiencies			Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination	Description	Executing Body	Date of Completion	Priority for Action
No Deficiencies Reported									

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Hariri, Beirut Intl. Airport BEIRUT/ Rafic Hariri Intl (OLBA)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H	Corrective Action Plan has not been formally provided by the State	Lebanon	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

LIBYA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Benina, Sebha, and Tripoli Intl Airports BENGHAZI/Benina (HLLB), SEBHA/Sebha (HLLS), TRIPOLI/Tripoli Intl (HLLT)	Implementation of Certification of Aerodromes used for international operations	May, 2015	-	F H S	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A

(1) Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

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Deficiencies in the AOP Field

OMAN

Item No	Identification		Deficiencies			Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination	Description	Executing Body	Date of Completion	Priority for Action
No Deficiencies Reported									

⁽¹⁾ Rationale for non-elimination: "F"= Financial

"H"= Human Resources

"S"= State (Military/political)

"O"= Other unknown causes

Deficiencies in the AOP Field

QATAR

Item No	Identification		Deficiencies			Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination	Description	Executing Body	Date of Completion	Priority for Action
No Deficiencies Reported									

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

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Deficiencies in the AOP Field

SAUDI ARABIA

Item No	Identification		Deficiencies			Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination	Description	Executing Body	Date of Completion	Priority for Action
No Deficiencies Reported									

⁽¹⁾ Rationale for non-elimination: "F"= Financial

"H"= Human Resources

"S"= State (Military/political)

"O"= Other unknown causes

Deficiencies in the AOP Field

SUDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Nyala and El Obeid Intl. Airports - Nyala/Nyala Airports	Implementation of Certification of Aerodromes used for international operations	May, 2015	- -Certification of NYALA/Nyala (HSNN) Will be in January 2018	F H	Corrective Action Plan has not been formally provided by the State !	Sudan	Dec, 2018 Jan, 2018	A

(1) Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table AOP II-1	Damascus int'l Airport	Apron lighting inadequate	Sep, 2003	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
2	MID eANP VOL II Table AOP II-1	Damascus int'l Airport	Runway surface rough and damaged. Runway markings unsatisfactory	Sep, 2003	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
3	ANNEX 14 VOL I: Para. 1.4	Damascus, Aleppo, Bassel Al-Assad Intl. Airports ALEPPO/Aleppo Intl (OSAP), DAMASCUS/Damascus Intl (OSDI), LATTAKIA/Bassel AL-Assad Intl (OSLK)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: "F"= Financial

"H"= Human Resources

"S"= State (Military/political)

"O"= Other unknown causes

Deficiencies in the AOP Field

UAE

Item No	Identification		Deficiencies			Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination	Description	Executing Body	Date of Completion	Priority for Action

No Deficiencies Reported

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Sana`a, Aden, Hodeidah, Mukalla, Taiz Intl. Airports ADEN/Aden Intl (OYAA), HODEIDAH/ Hodeidah Intl (OYHD), MUKALLA/Riy an Intl (OYRN), SANA`A/Sana`a Intl (OYSN), TAIZ/ Taiz Intl (OYTZ)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Note:* Priority for action to remedy a deficiency is based on the following safety assessments:

'U' priority = Urgent requirements having a direct impact on safety and requiring immediate corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

'A' priority = Top priority requirements necessary for air navigation safety.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

'B' priority = Intermediate requirements necessary for air navigation regularity and efficiency.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

Definition:

A deficiency is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

ATTACHMENT A

LIST OF PARTICIPANTS

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NAME	TITLE
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