INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SECOND MEETING OF THE MID REGION ELECTRONIC TERRAIN AND OBSTACLE DATA WORKING GROUP (eTOD WG/2)

(Tehran, Iran, Islamic Republic of, 3-4 May 2009)

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

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

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PART I – HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Second Meeting of the Middle East Region Electronic Terrain and Obstacle Data Working Group (eTOD WG/2) was held from 3 to 4 May 2009 at the Islamic Republic of Iran Broadcasting (IRIB) Int'l Conference Centre (IICC) in Tehran.

2. OPENING

2.1 The Head of Civil Aviation Organization (CAO) Capt. Hussein Khanlari addred the meeting thanking all guests and welcoming them to Iran. He announced that safety of civil aviation, which is considered as a continuous challenge, should be given the utmost importance and priority. In this regard, the implementation of eTOD would improve safety. He highlighted the direct link of eTOD with the Controlled Flight Into Terrain (CFIT), emphasizing that the implementation of eTOD requires knowledgeable and skilled personnel and that this could be achieved only with appropriate training. He encouraged the coordination and cooperation between MID States, underlined the role of the ICAO MID Regional Office in this respect and ensured Iran's continuous support to the ICAO MID Regional Office and MIDANPIRG activities.

2.2 The Minister of Road & Transportation, H.E Dr. Hamid Behbahani welcomed all participants to the Islamic republic of Iran and wished them a pleasant stay in Tehran and a successful meeting. He acknowledged the challenges for hosting and convening such kind of meetings. However, he underlined that this is a must with a view to exchange information and views between experts. He re-iterated his State's wish to host future ICAO meetings in Iran. Dr. Behbahani highlighted that while we are paving the future, by developing implementation plans, strategies, etc, we have to comply with the current SARPs. He mentioned that the eTOD WG/2 meeting offers a good forum for the Experts from the Region to exchange views and share experience related to the implementation of eTOD with the objective of improving the overall safety and efficiency of air transport. At the end, he underlined that safety is a global issue and that despite the imposed sanctions on the provision of aircraft and aviation related spare parts, Iran is working hard to renew/maintain its aviation fleet and aerodrome and air navigation infrastructure to improve safety.

2.3 In his opening address, The Chairman of the Board and Chief Executive Officer of the Iranian Airport Company (IAC), Mr. Mo'menirokh welcomed all participants to Tehran and provided an overview of the developments of aviation infrastructure in Iran. He mentioned that the MID Region has reached a good level of safety thanks to the good coordination and cooperation between MID States and the ICAO MID Regional Office. In this regard, he enumerated some of the achievements of the MID Region, especially the implementation of RVSM, the MID RMA, EMARSSH, etc.

2.4 Mr. Jehad Faqir Deputy Regional Director of the ICAO MID Regional Office, on behalf of Mr. Mohamed R. M. Khonji, the Regional Director, welcomed all participants to the Second Meeting of the MID eTOD Working Group and expressed his gratitude to his Excellency Dr. Behbahani, The Minister of Road & Transportation to Capt. Khanlari, Deputy Minister and head of Iranian CAO and to Mr. Mo'menirokh, Chairman of the Board and Chief Executive Officer of the Iranian Airport Company (IAC) for hosting this meeting and for their generous hospitality. He highlighted the importance of Iran and Tehran FIR as key player in the MID Region and pointed out that the hosting of this meeting in Tehran is another prove of the active role Iran is playing and of the continuous support to the ICAO MID Regional Office and MIDANPIRG activities. Mr Faqir underlined that significant safety benefits for international civil aviation can be provided by in-flight and ground based applications that rely on quality electronic Terrain and Obstacle Data (eTOD). He listed briefly the most important subjects to be addressed by the meeting. In closing, he wished the meeting successful deliberation and fruitful results.

3. ATTENDANCE

3.1 The meeting was attended by a total of 47 participants, which included experts from 7 States and 1 Company. The list of participants is at **Attachment A** to the Report.

4. OFFICERS AND SECRETARIAT

4.1 Mr. Mohamed Smaoui, RO/AIS/MET, was the Secretary of the meeting, supported by Mr. Jehad Faqir, Deputy Regional Director, ICAO MID Regional Office.

5. LANGUAGE

5.1 The discussions were conducted in English. Documentation was issued in English.

6. AGENDA

6.1 The following Agenda was adopted:

Agenda Item 1: Adoption of the provisional agenda

Agenda Item 2: Follow-up on MIDANPIRG/11 Conclusions and Decisions related to eTOD

Agenda Item 3: Review and analysis of eTOD requirements

Agenda Item 4: eTOD planning and implementation

Agenda Item 5: Future Work Programme

Agenda Item 6: Any other business

7. CONCLUSIONS AND DECISIONS – DEFINITION

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

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

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

8. LIST OF CONCLUSIONS AND DECISIONS

DRAFT CONCLUSION 2/1:	***e****TOD CHECKLIST*
DRAFT CONCLUSION 2/2:	***e****TOD AWARENESS CAMPAIGNS*
DRAFT CONCLUSION 2/3:	*PROPOSAL FOR AMENDMENT TO THE MID BASIC ANP (DOC 9708) RELATED TO* ***e****TOD*
DRAFT DECISION 2/4:	*DISSOLUTION OF THE* ***e****TOD WORKING GROUP*

PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA

1.1 The meeting reviewed and adopted the provisional agenda as at paragraph 6 of the history of the meeting.

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eTOD WG/2
Report on Agenda Item 2

REPORT ON AGENDA ITEM 2: FOLLOW-UP ON MIDANPIRG/11 CONCLUSIONS AND DECISIONS RELATED TO eTOD

2.2 The meeting reviewed an extract of the action plan developed by MIDANPIRG/11, containing the relevant list of Conclusions and Decision related to eTOD as at **Appendix 2A** to the Report on Agenda Item 2 and noted the follow-up action taken, so far, by the concerned parties.

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eTOD WG/2
Appendix 2A to the Report on Agenda Item 2

FOLLOW-UP ON MIDANPIRG/11 CONCLUSIONS AND DECISION RELATED TO eTOD

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONC. 11/4: IMPROVING THE EFFICIENCY OF THE ICAO MID FORUM That, a) Bahrain in coordination with ICAO: i) explore ways and means for improving the efficiency of the ICAO MID Forum; and ii) investigate the possibility of using the ICAO MID Forum for the posting of AIS publications by States. b) States are urged to make use and take full benefit of the ICAO MID Forum.	Implement the Conclusion	ICAO Bahrain	Draft Feasibility Study Improved MID Forum with new Functionalities	Dec. 2009 Jun. 2010	Ongoing
CONC. 11/13: MID BASIC ANP AND FASID (DOC 9708) That, a) further to the approval of the Proposal for amendment of the MID Basic ANP 08/05-AOP, the ICAO MID Regional Office, on behalf of MIDANPIRG, initiate all necessary Amendment Proposals to the MID Basic ANP and FASID, prior to MIDANPIRG/12, in order to update the AIS, AOP, ATM, CNS and MET tables; and b) ICAO is to allocate sufficient resources and give high priority for the publication of Doc 9708 in English and Arabic languages, incorporating all approved Amendments.	Process Amendments Proposals to the MID Basic ANP and FASID Finalize and publish the approved version of Doc 9708	ICAO	Amendment Proposal issued Amendment Proposal approved and incorporated in the final version of Doc 9708 Final Version of Doc 9708 published	 Mar. 2010 TBD	Ongoing

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
CONC. 11/43: MID REGION eTOD IMPLEMENTATION STRATEGY That, the MID Region eTOD implementation Strategy is adopted as at **Appendix 5.3B** to the Report on Agenda Item 5.3.	Follow up the eTOD implementation status	States eTOD WG AIS/MAP TF	Feed back from States updated eTOD status of implementation	May 2009	Proposed to be replaced and superseded by Draft Conc. 2/1 and 2/3.
CONC. 11/44: DRAFT FASID TABLE RELATED TO eTOD That, ICAO consider to include the Draft FASID Table at **Appendix 5.3D** to the Report on Agenda Item 5.3, into the MID FASID, Part VIII (AIS), with necessary amendments, as appropriate.	Follow up with ICAO HQ	ICAO	eTOD FASID Table included in the MID FASID	TBD	Ongoing
DEC. 11/45: TERMS OF REFERENCE OF THE eTOD WORKING GROUP That, the Terms of Reference of the eTOD Working Group be updated as at **Appendix 5.3E** to the Report on Agenda Item 5.3.	Implement the eTOD WG Work Programme	eTOD WG AIS/MAP TF	eTOD WG/2 Report	May 2009	Proposed to be replaced and superseded by Draft Dec. 2/4.

REPORT ON AGENDA ITEM 3: REVIEW AND ANALYSIS OF eTOD REQUIREMENTS

3.1 The meeting recalled that significant safety benefits for international civil aviation will be provided by in-flight and ground-based applications that rely on quality electronic terrain and obstacle data (GPWS, MSAW, procedure design, PBN, etc). In this regard, it was highlighted that eTOD will be very useful and critical in emergency situations, i.e: emergency landing or missed approach, SAR activity in a mountainous area, etc. Accordingly, Amendment 33 to ICAO Annex 15 introduced the requirement for States to ensure that electronic sets of Terrain and Obstacle Data (eTOD) are made available. This data shall be provided for four distinct areas, with different data collection requirements.

3.2 The meeting reviewed and analysed the numerical requirements for terrain and obstacle data for areas 1, 2, 3 and 4 as defined in Annex 15, Appendix 8, Tables A8-1 and A8-2.

3.3 The meeting noted that the eTOD requirements have raised concern by States from both technical and institutional perspectives. Although there are a number of reasons for these concerns, the primary issue was related to implementation and maintenance costs for the data sets, in particular, those relating to the provision of data for Area 2. It was highlighted that the requirements related to Area 2, would be difficult and costly to implement and could therefore lead to a widespread non-compliance.

3.4 In connection with the above, the meeting noted that, a review of the eTOD SARPs and guidance material has been carried out within the framework of the EUROCONTROL Terrain and Obstacle Data Working Group (TOD WG) to determine if refinement of SARPs or development of additional guidance material was necessary. The meeting noted that an agreement was initially reached regarding the required changes/minor refinements for Area 1, Area 3 and Area 4, as well as some general changes affecting all areas.

3.5 The meeting was apprised of the outcome of the AIS-AIM SG/1 meeting held in Montreal, 2-4 December 2008 related to eTOD.

3.6 The meeting further noted that the Air Navigation Commission on 12 March 2009 carried out a preliminary review of draft Amendment 36 to Annex 15 and consequential amendments to Annexes 4, 11 and 14 and the PANS-ABC (Doc 8400) and that State Letter Ref.: AN 2/2.2-09/13 dated 23 April 2009 has been issued. It was highlighted that comments on the proposal for amendment to Annex 15 are expected to reach Montreal before 6 August 2009. Accordingly, the meeting urged States to study the proposal for amendment and send their comments to ICAO Headquarters before the deadline. The part of draft Amendment 36 to Annex 15 related to eTOD is attached as **Appendix 3A** to the Report on Agenda Item 3.

3.7 The meeting noted that the most important changes which would be introduced to Annex 15, Chapter 10 on eTOD consist of the following:

- The term “dataset” will be used instead of “database”, since it was concluded that the use of the word “database” was misleading as this is often interpreted as having the specific meaning of a relational database. With this interpretation in mind, it could be said that the term “database” is in conflict with the open approach taken by the ISO 19100 series of standards which are mandated by ICAO Annex 15 for the provision of TOD. Furthermore, ICAO Annex 15, when referring to the ISO 19100 series, refers to datasets in 10.5.2, compounding the inconsistency.

- No validation was found for the provision of Area 3 data other than to support synthetic vision operations in the future. In considering the provision of Area 3 data, no business case could be determined for the provision of such data by a State. Instead, it was concluded that the provision of such data should be at the discretion of the aerodrome operator and presumably would be based on a business case. It was assumed that some States may wish to provide Area 3 data and it is, therefore, submitted that the Area 3 requirements be amended from a Standard to a Recommendation.

- The current provisions in Chapter 10 require only terrain data for Area 4. It is stated that this data is used for height determination during CAT II/III operations. Today, this information is provided through the Precision Approach Terrain Chart (PATC). As this chart contains more than just terrain information, it was concluded that terrain data alone is insufficient to provide an electronic dataset which may replace the PATC. Consequently, it was agreed that an obstacle dataset should also be provided for Area 4. The dataset shall contain all the features which may impact height determination and which are not contained within the terrain dataset. The numerical requirements proposed for Area 4 obstacles are based upon those existing for terrain. With regard to physical size of Area 4, it was recommended that area of coverage should be extended along the extended centreline of the runway in areas where the terrain “*is mountainous or otherwise significant to users of the chart*”.

- The list of terrain attributes in ICAO Annex 15 includes “*Surface Type*” which has proven to be a major concern for States as this information is not typically available within existing datasets and, furthermore, is costly to determine. Nonetheless, the longer-term value of having this data was understood. As a result, it was agreed that this attribute should be a Recommendation.

- The list of obstacle attributes in ICAO Annex 15 did not include “Height” which was concluded as being a deficiency. As a result, it is proposed that this attribute is added.

3.8 The meeting noted that the revised Area 2 proposal has been developed based on the following principles:

- Area 2 remains as the area extending to 45km from the ARP or the TMA boundary whichever is the less;

- a small (10km) omni-directional area;
- a minimum obstacle height of 3m is applied within the extended runway strip;
- a minimum obstacle height of 3m within the take-off and approach areas;
- a minimum obstacle height of 15m elsewhere in the area within 10km unless safety or operational reasons dictate otherwise;
- in the remaining region from 10km to 45km or the TMA boundary obstacles higher than 100m above ground level are sufficient unless operational or safety reasons require data to be collected for obstacles above 30m; and
- a dataset is provided for the entire 45km (or TMA) region around an aerodrome.

3.9 The meeting was informed that the rationale behind the proposal for Area 2 is as follows:

- data with a high degree of accuracy and resolution is only needed where flight operations warrant it. This may typically be described as the area within 10km of the aerodrome and where planned operations bring aircraft close to terrain;
- outside of these regions obstacles above 100m above ground are considered to be sufficient;
- it is seen as not being pragmatic to capture every obstacle as, especially where terrain rises, many small obstacles may penetrate the surface whilst the terrain itself is the constraining factor in flight operations;
- within the approach and take-off areas and aerodrome area, a minimum obstacle height of 3m is considered to be safe. This has been derived from the accuracy requirements of Area 2 obstacles where a vertical accuracy of 3m is specified;
- outside of these areas, but within 10km of the aerodrome, a minimum obstacle height of 15m is set. This is considered to provide a reasonable minimum and makes use of the vegetation buffers that are normally applied within procedure design;
- where it is deemed necessary that obstacles over 3m are provided within this area but outside of the approach and take-off areas, then they shall be collected;
- in the area between 10km and 45km, obstacles with a height greater than 100m are considered to provide a sufficient dataset unless safety or operational reasons necessitate data for obstacles above 30m; and
- where it is deemed necessary that obstacles over 30m are provided within the area between 10km to 45km, they shall be collected.

3.10 Based on the above, the meeting noted that in the proposed Draft Amendment 36 to Annex 15, Area 2 shall be divided into four sub-areas as follows:

- Area 2a is described as a rectangular area around the runway extending to 255m each side of the runway centre line with the length of the runway strip plus any clearway(s) that exist;

- Area 2b is described as a surface with a 1.2% slope extending from the ends of Area 2a with a length of 10km and a splay of 15% to each side;

- Area 2c is described as an Area with a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km to the boundary of Area 2a; and

- Area 2d is described as the remainder of Area 2 outside the Areas 2a, 2b and 2c up to a distance of 45km from the ARP, or the TMA boundary, whichever is smaller.

3.11 Accordingly, obstacles shall be collected if they:

- are located within Area 2a and their height exceeds 3m above ground level;

- penetrate the surface in Area 2b and their height exceeds 3m above ground level;

- penetrate the surface in Area 2c and their height exceeds 15m above ground level; and

- are located within Area 2d and their height exceeds 100m above ground level.

3.12 The meeting agreed that the above proposal will offer a saving of 90% when geographic footprint is considered, with consequent reduction in data collection requirements and cost.

3.13 The meeting noted that it's proposed to postpone the applicability date related to eTOD provisions for Area 2 and Area 3 from 18 November 2010 to 15 November 2012 and supported this proposal.

3.14 The meeting raised concern about the non-attendance of the users' organizations (IATA and IFALPA) and highlighted the importance of involvement of the end users (pilots) in order to bring their requirements, taking into consideration the fleet capabilities in the MID Region, and accordingly avoid investing money in something which will not be used by the airlines. In this respect, reference was made to Annex 15 para. 10.2.5, Note 2 where it's stated that "*It is recognized that some applications listed in 10.1 could be adequately accommodated with terrain and obstacle data sets that are of lower requirements than those specified in Appendix 8, Table A8-1 and Table A8-2, respectively. Consequently, careful evaluation of available data sets by data users is necessary in order to determine if the products are fit for their intended use*".

3.15 The meeting highlighted the importance of the quality of the eTOD datasets. In this regard, the meeting recalled that the MID eTOD Seminar held in Cairo from 11 to 14 December 2006, through Recommendation 2, invited States to "*make an inventory and evaluate the quality of existing terrain and obstacle data sources and in the case of data collection, consider carefully the required level of details of collected terrain and obstacle data with particular emphasis on obstacle data and associated cost*. Reference was also made to Annex 15 para. 10.5.6 where it's stated that both terrain data product specifications and obstacle data product specifications shall identify the data quality requirements for each data product. This shall include a statement on acceptable conformance quality levels and corresponding data quality measures. The meeting further noted that ISO Standard 19113 contains quality principles for geographic information.

3.16 The meeting highlighted that some of the legal and institutional issues pertaining to eTOD are still not solved/addressed. Accordingly, States were urged to address these issues when developing their national regulations related to eTOD.

~~8.2.2~~ 8.2.4 **Recommendation.—** *Automated pre-flight information systems providing a harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information in accordance with 8.2.1 and meteorological information in accordance with 9.5.1 of Annex 3* — Meteorological Service for International Air Navigation, *should be established by an agreement between the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 3.1.1 c) and the relevant meteorological authority.*

~~8.2.3~~ 8.2.5 Where automated pre-flight information systems are used to provide the harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information/ data and meteorological information, the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 3.1.1 c) shall remain responsible for the quality and timeliness of the aeronautical information/ data provided by means of such a system.

Note.— The meteorological authority concerned remains responsible for the quality of the meteorological information provided by means of such a system in accordance with 9.5.1 of Annex 3.

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CHAPTER 10. ELECTRONIC TERRAIN AND OBSTACLE DATA

10.1 Function

Sets of electronic terrain and obstacle data used in combination with aeronautical data, as appropriate, shall ~~satisfy user requirements necessary to~~ support the following air navigation applications:

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10.2 Coverage and terrain and obstacle data numerical requirements

10.2.1 ~~To satisfy requirements necessary to accommodate air navigation systems or functions specified in 10.1, sets of electronic~~ Electronic terrain and obstacle data shall be collected and recorded in ~~databases~~ data sets in accordance with the following coverage areas:

— Area 1: entire territory of a State;

— Area 2: terminal control area;

— Area 3: aerodrome/heliport area; and

— Area 4: Category II or III operations area.

Note.— See Appendix 8 for graphical illustrations of the defined coverage areas.

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10.2.3 Area 2 data shall be provided for all aerodromes regularly used by international civil aviation.

10.2.4 **Recommendation.—** *Area 3 data should be provided at those aerodromes/heliports where it is considered to be beneficial, e.g. where it is supported by the availability of aerodrome mapping data.*

~~10.2.3~~ 10.2.5 ~~At IFR aerodromes/heliports,~~ When provided, Area 3 shall cover the area that extends from the edge(s) of the runway(s) to 90 m from the runway centre line(s) and for all other parts of aerodrome/heliport movement area(s), 50 m from the edge(s) of the defined area(s).

~~10.2.4~~ 10.2.6 Area 4 shall be restricted to those runways where precision approach Category II or III operations have been established and where detailed terrain and appropriate obstacle information is required by operators to enable them to assess, by use of radio altimeters, the effect of terrain and obstacles on decision height determination. The width of the area shall be 60 m on either side of the extended runway centre line while the length shall be 900 m from the runway threshold measured along the extended runway centre line.

Note.— Area 4 terrain data and Area 2 obstacle data are normally sufficient to support the production of the Precision Approach Terrain Chart — ICAO. When more detailed obstacle data is required for Area 4, this may be provided in accordance with the Area 4 obstacle data requirements specified in Appendix 8, Table A8-2. Guidance on appropriate obstacles for this chart is given in the Aeronautical Chart Manual *(Doc 8697).*

10.2.7 **Recommendation**.— *Where the terrain at a distance greater than 900 m (3 000 ft) from the runway threshold is mountainous or otherwise significant, Area 4 should be extended to a distance not exceeding 2 000 m from the runway threshold.*

~~10.2.5~~ 10.2.8 ~~According to the air navigation applications listed in 10.1 and areas of coverage,~~ ~~sets~~ Sets of electronic terrain data shall satisfy the numerical requirements specified in Appendix 8, Table A8-1 while obstacle data shall satisfy the numerical requirements specified in ~~Appendix 8,~~ Table A8-2.

Note 1.— Numerical terrain and obstacle data requirements for Area 2 provided in ~~Appendix 8,~~ Table A8-1 and Table A8-2, respectively, are defined on the basis of the most stringent application requirement (application listed under 10.1 b)).

Note 2.— It is recognized that some applications listed in 10.1 could be adequately accommodated with terrain and obstacle data sets that are of lower requirements than those specified in ~~Appendix 8,~~ Table A8-1 and Table A8-2, respectively. Consequently, careful evaluation of available data sets by data users is necessary in order to determine if the products are fit for their intended use.

10.3 Terrain ~~database~~ data set — content and structure

10.3.1 A terrain ~~database~~ data set shall contain digital sets of data representing terrain surface in the form of continuous elevation values at all intersections (points) of a defined grid, referenced to common datum. A terrain grid shall be angular or linear and shall be of regular or irregular shape.

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10.3.3 Terrain data shall be collected according to the areas specified in 10.2, terrain data collection surfaces and criteria specified in ~~Appendix 8, Figure~~ Figures A8-1, A8-3 and A8-4, and in accordance with the terrain data numerical requirements provided in Table A8-1 ~~of Appendix 8~~. In terrain ~~databases~~ data sets, only one feature type, i.e. terrain, shall be recorded. Feature attributes describing terrain shall be those listed in ~~Appendix 8,~~ Table A8-3. The terrain feature attributes listed in Table A8-3 represent the minimum set of terrain attributes, and those annotated as mandatory shall be recorded in the terrain ~~database~~ data set.

10.4 Obstacle ~~database~~ data set — content and structure

10.4.1 ~~One obstacle database~~ Obstacle data sets shall contain ~~a~~ digital ~~set of~~ obstacle data and shall include all obstacles that penetrate the collection surfaces defined in Figure A8-2 ~~those features having vertical significance in relation to adjacent and surrounding features that are considered hazardous to air navigation~~. Obstacle data shall comprise the digital representation of the vertical and horizontal extent of man-made objects. Obstacles shall not be included in terrain ~~databases~~ data sets. Obstacle data elements are features that shall be represented in the ~~database~~ data sets by points, lines or polygons.

10.4.2 Obstacles, which in accordance with the definition, can be fixed (permanent or temporary) or mobile shall be identified within the areas defined in 10.2, on the basis of the obstacle data collection surfaces and criteria specified in ~~Appendix 8, Figure~~ Figures A8-2, A8-3 and A8-4, and collected in accordance with obstacle data numerical requirements provided in Table A8-2 ~~of Appendix 8~~. In an obstacle ~~database~~ data set, all defined obstacle feature types shall be recorded and each of them shall be described according to the list of mandatory attributes provided in Table A8-4 ~~of Appendix 8~~.

Note.— Specific attributes associated with mobile (feature operations) and temporary types of obstacles are annotated in ~~Appendix 8,~~ Table A8-4~~,~~ as optional attributes. If these types of obstacles are to be recorded in the ~~database~~ data set, appropriate attributes describing such obstacles are also required.

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10.6 Availability

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10.6.1.1 States shall ensure that ~~as of 20 November 2008,~~ electronic terrain and obstacle data are made available in accordance with Area 1 specifications and terrain data in accordance with Area 4 specifications.

10.6.1.2 States shall ensure that as of ~~18 November 2010~~ 15 November 2012, electronic terrain and obstacle data are made available in accordance with Area 2 and Area 3 specifications.

10.6.1.3 **Recommendation.—** *States should ensure that electronic terrain and obstacle data are made available in accordance with ~~Area 1,~~ Area 2~~,~~ and Area 3 specifications ~~and terrain data in accordance with Area 4 specifications~~.*

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APPENDIX 8. TERRAIN AND OBSTACLE DATA REQUIREMENTS

(see Chapter 10)

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Editorial Note.— Replace Figure A8-2 with the following figure.

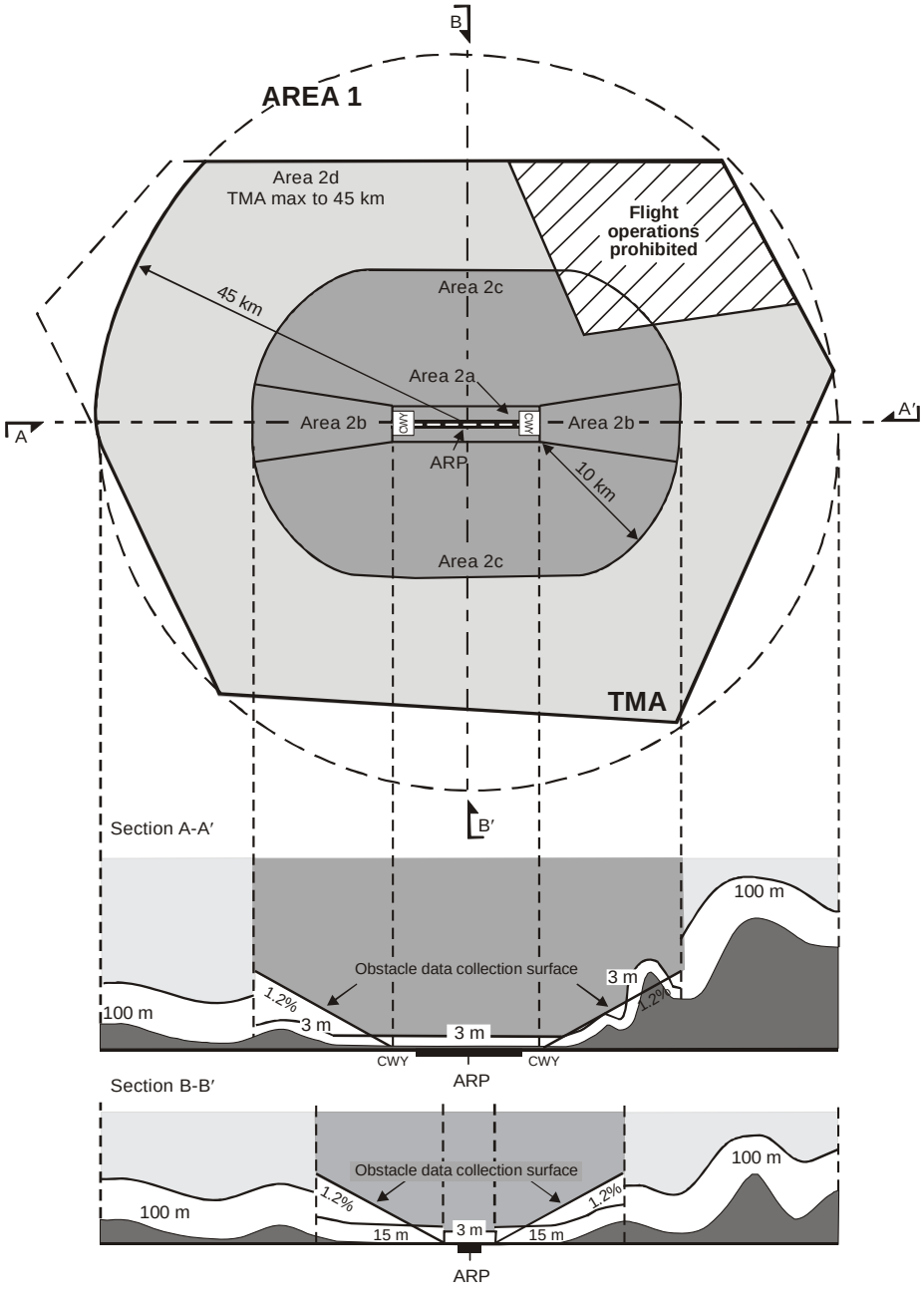

Figure A8-2. Obstacle data collection surfaces — Area 1 and Area 2

1. Obstacle data shall be collected and recorded in accordance with the Area 2 numerical requirements specified in Table A8-2:

Editorial Note.— Delete the following existing text.

a) any obstacle that penetrates the conical surface whose origin is at the edges of the 180-m wide rectangular area and at the nearest runway elevation measured along the runway centre line, extending at 1.2 per cent slope until it reaches 120 m above the lowest runway elevation of all operational runways at the aerodrome (1.2 per cent slope reaches 120 m at 10 km); in the remainder of Area 2 (between 10 km and the TMA boundary or 45-km radius, whichever is smaller), the horizontal surface 120 m above the lowest runway elevation; and

Editorial Note.— Insert the following new text.

a) Area 2 shall be divided into four sub-areas as follows:

— Area 2a is described as a rectangular area around the runway extending to 255 m each side of the runway centre line with the length of the runway strip plus any clearway(s) that exist;

— Area 2b is described as a surface with a 1.2% slope extending from the ends of Area 2a with a length of 10 km and a splay of 15% to each side;

— Area 2c is described as an Area with a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km to the boundary of Area 2a; and

— Area 2d is described as the remainder of Area 2 outside the Areas 2a, 2b and 2c up to a distance of 45 km from the ARP, or the TMA boundary, whichever is smaller;

b) obstacles shall be collected if they:

— are located within Area 2a and their height exceeds 3 m above ground level;

— penetrate the surface in Area 2b and their height exceeds 3 m above ground level; and

— penetrate the surface in Area 2c and their height exceeds 15 m above ground level;

c) in Area 2d, obstacles whose height exceeds 100 m above ground level shall be collected and recorded in the dataset.

End of new text.

~~b)~~ 2. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, terrain data shall only be collected and recorded in accordance with the Area 1 numerical requirements.

~~2.~~ 3. Data on every obstacle within Area 1 whose height above the ground is 100 m or higher shall be collected and recorded in the data set in accordance with the Area 1 numerical requirements specified in Table A8-2.

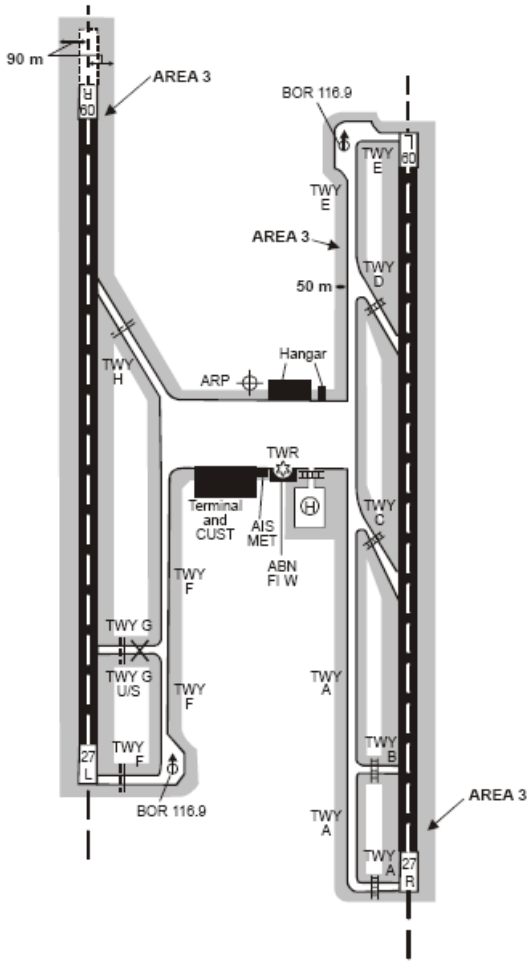

Figure A8-3. Terrain and obstacle data collection surface — Area 3

1. Data on terrain and obstacles, except frangible objects as defined by Annex 14, that extend more than a half-metre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome/heliport movement area shall be collected and recorded.

2. Terrain and obstacle data in Area 3 shall be collected and recorded in accordance with numerical requirements specified in Table A8-1 and Table A8-2, respectively.

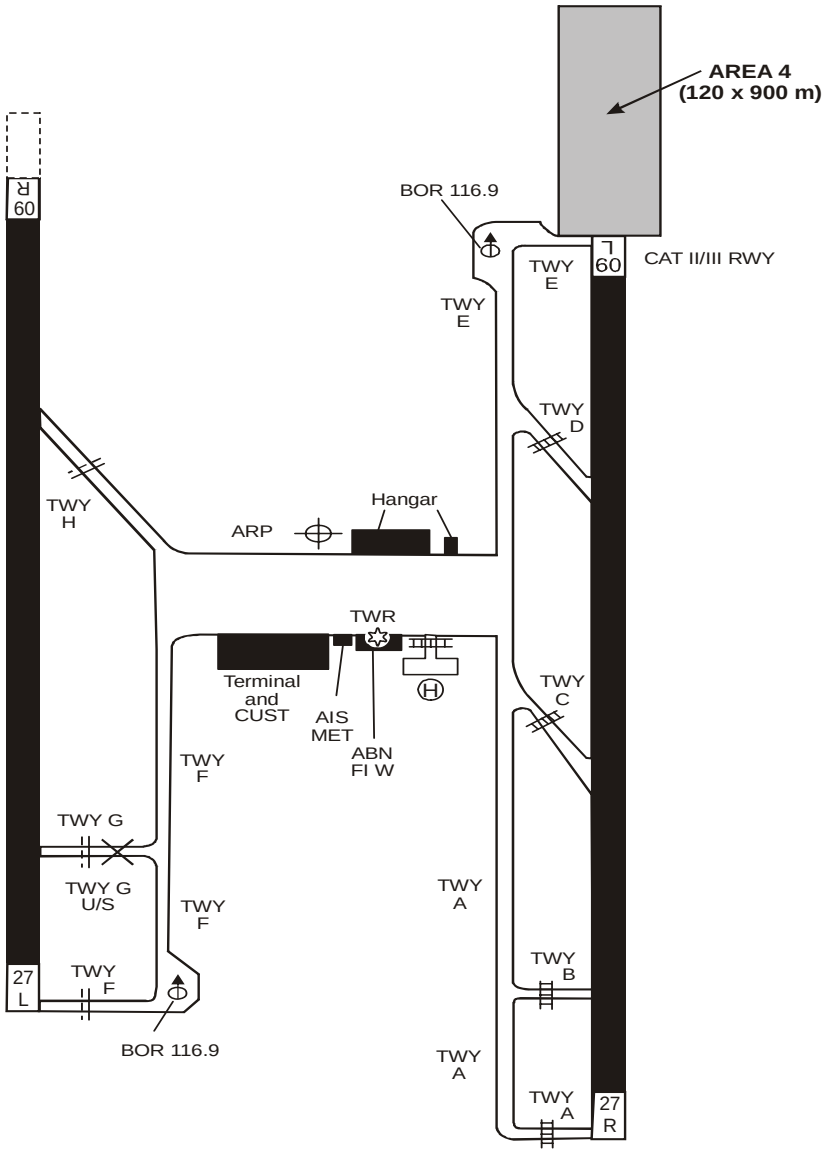

Figure A8-4. Terrain and obstacle data collection surface — Area 4

~~Only terrain~~ Terrain data shall be collected and recorded in Area 4 in accordance with the numerical requirements specified in Table A8-1.

Note 1.— The horizontal extent of Area 2 covers Area 4. More detailed obstacle data may be collected in Area 4 in accordance with Area 4 numerical requirements for obstacle data specified in Table A8-2. (See 10.2.6.)

Note 2.— Area 4 may be extended in accordance with 10.2.7.

Table A8-1. Terrain data numerical requirements

	Area 1	Area 2	Area 3	Area 4
Post spacing	3 arc seconds (approx. 90 m)	1 arc second (approx. 30 m)	0.6 arc seconds (approx. 20 m)	0.3 arc seconds (approx. 9 m)
Vertical accuracy	30 m	3 m	0.5 m	1 m
Vertical resolution	1 m	0.1 m	0.01 m	0.1 m
Horizontal accuracy	50 m	5 m	0.5 m	2.5 m
Confidence level ~~(1σ)~~	90%	90%	90%	90%
Data classification Integrity level	routine 1×10^{-3}	essential 1×10^{-5}	essential 1×10^{-5}	essential 1×10^{-5}
Maintenance period	as required	as required	as required	as required

Table A8-2. Obstacle data numerical requirements

	Area 1	Area 2	Area 3	Area 4
Vertical accuracy	30 m	3 m	0.5 m	1 m
Vertical resolution	1 m	0.1 m	0.01m	0.1 m
Horizontal accuracy	50 m	5 m	0.5 m	2.5 m
Confidence level ~~(1σ)~~	90%	90%	90%	90%
Data classification Integrity level	routine 1×10^{-3}	essential 1×10^{-5}	essential 1×10^{-5}	essential 1×10^{-5}
Maintenance period	as required	as required	as required	as required

Table A8-3. Terrain attributes

Terrain attribute	Mandatory/Optional
. . .	
Vertical confidence level	Mandatory
Surface type	~~Mandatory~~ Optional
Recorded surface	Mandatory
. . .	

Table A8-4. Obstacle attributes

Obstacle attribute	Mandatory/Optional
. . .	
Elevation	Mandatory
Height	Optional
Vertical accuracy	Mandatory
. . .	

— — — — — — — — —

REPORT ON AGENDA ITEM 4: eTOD PLANNING AND IMPLEMENTATION

4.1 The meeting recalled that the MIDANPIRG/11 meeting held in Cairo, 9-13 February 2009, was apprised of the outcome of the First eTOD Working Group meeting (Amman, Jordan, 2-4 July 2007) as reviewed by the AIS/MAP TF/4, ATM/SAR/AIS SG/9 and ATM/SAR/AIS/ SG/10 meetings.

4.2 The meeting recalled that MIDANPIRG/11 noted that the AIS/MAP TF/4, ATM/SAR/AIS SG/9 and SG/10 meetings agreed with the eTOD WG/1 meeting that MID States would not face major difficulties to comply with the applicability date of 20 November 2008 for the provision of eTOD for areas 1 and 4. However, it was noted that the majority of States have not yet complied with the requirements especially those related to the provision of obstacles for area 1.

4.3 The meeting noted that with a view to collect information from States regarding their Action Plan/Roadmap for the implementation of eTOD and to assist them in the implementation process, the ICAO MID Regional Office carried out a survey on the implementation of eTOD in the MID Region. It was noted that the eTOD questionnaire developed by the eTOD WG/1 meeting was sent to States for the first time on 17 July 2007. Further to the decisions of the ATM/SAR/AIS SG/9 and SG/10 meetings, the questionnaire was resent to States on 16 January and 17 December 2008. However, due to the low level of replies received from States, MIDANPIRG/11 agreed to refer back the subject to the eTOD WG/2 meeting, in order to collect more information from States on the implementation of eTOD and explore ways and means to expedite this process.

4.4 Based on the above the meeting reviewed and endorsed the eTOD checklist at **Appendix 4A** to the Report on Agenda Item 4, in order to assist States in the process of planning and implementation of eTOD provisions and agreed accordingly to the following Draft Conclusion:

DRAFT CONCLUSION 2/1: eTOD CHECKLIST

*That, States be encouraged to use the eTOD checklist at **Appendix 4A** to the Report on Agenda Item 4 in order to assist them in the process of planning and implementation of the eTOD provisions.*

4.5 The meeting highlighted that the implementation of eTOD provisions is a challenge for all concerned. It was also recognized that some of those who should be involved in the implementation process were not aware of the responsibilities that they might have and that only a small cross section of those affected were fully aware of the implications and the new responsibilities arising. Furthermore, as a result of the nature of the task and the new technologies and standards that are involved, it was underlined that many stakeholders require training to enable them to perform the tasks for which they are responsible.

4.6 Based on the above the meeting agreed that States should organize awareness campaigns and training events (workshops) involving all concerned personnel from within and outside the CAA in order to provide an overview of the technical, legal, institutional and financial issues related to eTOD as well as of the actions that need to be taken in implementing eTOD and to bring a high-level understanding of the associated topics. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 2/2: eTOD AWARENESS CAMPAIGNS

That, for the sake of an efficient and harmonized implementation of eTOD, States at the National Level and, to the extent possible co-operatively, organize awareness campaigns and training programmes to promote and expedite the process of eTOD implementation.

4.7 The meeting agreed that further to the publication of the eTOD WG/2 Report, a State Letter should be issued by the ICAO MID Regional Office with a view to invite States to use the eTOD checklist in the process of planning and implementation of eTOD and invite them to organize eTOD awareness campaigns and training events in compliance with the above Draft Conclusion.

4.8 The need for guidance material related to the implementation of eTOD was highlighted. It was recalled, in this regard, that ICAO has already developed and published "*GUIDELINES FOR ELECTRONIC TERRAIN, OBSTACLE AND AERODROME MAPPING INFORMATION – DOC 9881*", which contains a lot of guidance material on eTOD as well as on Aerodrome Mapping. However, the need for a concise document was underlined. In this regard, the meeting noted that EUROCONTROL is in the process of developing guidance material related to the implementation of eTOD.

4.9 The meeting reviewed and updated the MID Region AIS/MAP Timelines related to eTOD as at **Appendix 4B** to the Report on Agenda Item 4. It was noted in this regard that no State from the MID Region has notified ICAO of a difference to the provisions of Annex 15, Chapter 10. It was also noted that the majority of States will not be able to implement the eTOD provisions related to Area 2 and Area 3 before November 2012.

4.10 The meeting exchanged views and shared experience regarding the implementation of eTOD provisions. In this regard, the meeting encouraged States to register into the EUROCONTROL eTOD Forum and follow up all the discussions posted on this forum which proved to be very informative. The meeting urged States also to use the ICAO MID Forum to post any query or useful information related to eTOD on this forum. In this regard, the meeting re-iterated MIDANPIRG/11 Conclusion 11/4 related to improving the efficiency of the ICAO MID Forum and recognized that the improvement of the Forum would be efficient only if it's based on feedback received from States/users which have already used the Forum and faced some difficulties or noted some shortcomings.

4.11 The meeting recalled that the MID Region eTOD Implementation Strategy at **Appendix 4C** to the Report on Agenda Item 4 was reviewed and endorsed by MIDANPIRG/11 through Conclusion 11/43. The meeting urged States to comply with the MID Region eTOD Implementation Strategy. It was further recalled that MIDANPIRG/11, based on a Recommendation from the MSG/1 meeting held in Dubai, 1-3 July 2008, agreed that the MIDANPIRG Conclusions and Decisions which are of general nature and their status of implementation would be "Ongoing" for many years are more suitable for inclusion in the Air Navigation Plan, Handbooks, Manuals, Guidelines, etc, as appropriate.

4.12 Based on the above, the meeting reviewed the draft proposal for amendment to the MID Basic ANP at **Appendix 4D** to the Report on Agenda Item 4, with a view to introduce a new part related to eTOD based on the MID Region eTOD Implementation Strategy and agreed accordingly to the following Draft Conclusion:

DRAFT CONCLUSION 2/3: ***PROPOSAL FOR AMENDMENT TO THE MID BASIC ANP (DOC 9708) RELATED TO eTOD***

That,

*a) MID States review the draft proposal for amendment to the MID Basic ANP (Part VIII) at **Appendix 4D** to the Report on Agenda Item 4 and send their comments to the ICAO MID Regional Office before **15 August 2009**; and*

b) the ATM/SAR/AIS Sub-Group further review and refine, as necessary, the proposal and propose to MIDANPIRG its inclusion in the MID Basic ANP, in accordance with standard procedure.

4.13 The meeting agreed that a State Letter should be issued by the ICAO MID Regional Office inviting States to comment on the draft proposal for amendment to the MID Basic ANP (Part VIII).

4.14 The meeting recalled that MIDANPIRG/11, through Conclusion 11/44, invited ICAO to consider the inclusion of a Draft FASID Table related to the implementation of eTOD into the MID FASID, Part VIII (AIS), with necessary amendments, as appropriate.

4.15 The meeting noted that, further to the approval of the proposal for amendment of the MID Basic ANP 08/05-AOP, MIDANPIRG/11, through Conclusion 11/13, agreed that the ICAO MID Regional Office, on behalf of MIDANPIRG, initiate all necessary Amendment Proposals to the MID Basic ANP and FASID, prior to MIDANPIRG/12, in order to update the AIS, AOP, ATM, CNS and MET Tables.

4.16 Based on the above, the meeting reviewed and updated the Draft MID FASID Table AIS 9 as at **Appendix 4E** to the Report on Agenda Item 4 and agreed to its inclusion as part of the Proposal for Amendment of the MID FASID (AIS Tables), which would be developed by the AIS/MAP Task Force.

ICAO MIDDLE EAST OFFICE
ELECTRONIC TERRAIN AND OBSTACLE DATA (eTOD) CHECKLIST

Introduction:

The purpose of this eTOD checklist is to assist States in the process of implementation of eTOD. To ensure a safe and efficient implementation of eTOD, the Civil Aviation Authorities should:

- determine the parties/administrations involved in the implementation of eTOD, inter-alia:

    - Ministry responsible for Transportation/Civil Aviation;
    - Civil Aviation Authority;
    - Air Navigation Service Provider (ANSP);
    - Aerodrome Service Providers;
    - National Geographic, Geodetic, Topographic and/or Survey Administrations/Agencies;
    - Military;
    - Airlines;
    - Local Authorities or those responsible for aerodrome safeguarding/construction approval in the vicinity of aerodromes;
    - GSM antenna operators;
    - Administrations for radio and television broadcasts;

- ensure that a Focal Point has been nominated to coordinate all eTOD issues at both the national and international level;

- ensure that awareness campaigns and training programmes related to eTOD have been planned/organized for the benefit of all concerned staff from within and outside the CAA;

- check the availability of State's policy for the safeguarding of aerodromes from obstacle penetration, consider how effective the policy is and determine if available data can be demonstrated to be in compliance with eTOD requirements. In the absence of a declared or established policy, consider establishing one;

- check if National regulation for the provision of eTOD has been developed. In the absence of a National Regulation, consider establishing one, taking into consideration the following:

    - the data sources which should be regulated, the responsibility for the provision and process of data;
    - State's policy with regard to implementing the ICAO Annex 15 SARPs related to eTOD and eventually the notification of difference, if any;
    - State's policy with regard to data maintenance;
    - consider how and by whom the eTOD will be made available;
    - State's policy for the oversight/inspection of all involved parties/administrations in the process of provision of eTOD; and
    - State's policy for cost-recovery related to the provision of eTOD. Identify how the costs, both initial and ongoing, are to be recovered for each Area and in case charges are to be levied on the use of data, identify the appropriate means/mechanisms by which the revenue can be collected.

- ensure that necessary resources for the implementation of eTOD have been secured;

- ensure that an Action Plan/Roadmap with clear timelines and assigned responsibilities for the provision of eTOD has been developed;
- ensure that the possible sources of terrain and obstacle data have been identified;

- ensure that the candidate techniques that will be used for Terrain and Obstacle Data acquisition have been identified and determined;

- ensure that the survey requirements for each of the four Areas, including resurvey intervals have been determined;

- ensure that the responsibilities that may be placed upon surveyors to ensure that they use the correct standards, have been identified;

- ensure that a mechanism is established to ensure that the quality of eTOD is maintained from the survey up to the end user;

- ensure that cross-boarder issues have been addressed and consider the establishment of agreements with neighboring States to exchange and harmonize common data, as necessary;

- ensure that the means/media by which each dataset shall be made available have been determined; and

- ensure that means of carrying out oversight/inspections for monitoring progress have been established.

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eTOD WG/2
Appendix 4B to the Report on Agenda Item 4

Middle East Region

AIS/MAP IMPLEMENTATION PLAN

eTOD Updated Timelines

TIMELINES:

Global

Regional

National

Middle East — Aeronautical Information Services Implementation

		2000	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Global	Provision of Terrain Data for Area 1																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	
Global	Provision of Obstacle Data for Area 1																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	

Middle East — Aeronautical Information Services Implementation																		
		2000	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Global	Provision of Terrain Data for Area 2																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	
Global	Provision of Obstacle Data for Area 2																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	

Middle East — Aeronautical Information Services Implementation																		
		2000	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Global	Provision of Terrain Data for Area 3																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	
Global	Provision of Obstacle Data for Area 3																	
MID Region																		
States	Afghanistan																	
	Bahrain																	
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel																	
	Jordan																	
	Kuwait																	
	Lebanon																	
	Oman																	
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic																	
	United Arab Emirates																	
	Yemen																	

Middle East — Aeronautical Information Services Implementation																		
		2000	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Global	Provision of Terrain Data for Area 4																	
MID Region																		
States	Afghanistan									-	-	-	-	-	-	-	-	-
	Bahrain									-	-	-	-	-	-	-	-	-
	Egypt																	
	Iran, Islamic Rep. of																	
	Iraq																	
	Israel									-	-	-	-	-	-	-	-	-
	Jordan																	
	Kuwait																	
	Lebanon									-	-	-	-	-	-	-	-	-
	Oman									-	-	-	-	-	-	-	-	-
	Qatar																	
	Saudi Arabia																	
	Syrian Arab Republic									-	-	-	-	-	-	-	-	-
	United Arab Emirates																	
	Yemen									-	-	-	-	-	-	-	-	-

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eTOD WG/2
Appendix 4C to the Report on Agenda Item 4

MID REGION eTOD IMPLEMENTATION STRATEGY

Considering:

a) the new provisions introduced by Amendment 33 to Annex 15 related to eTOD; and

b) the guidance material contained in Doc 9881 (Guidelines for electronic Terrain, Obstacle and Aerodrome Mapping Information); and

Recognizing that:

i) significant safety benefits for international civil aviation will be provided by in-flight and ground-based applications that rely on quality electronic Terrain and Obstacle Data; and

ii) the implementation of eTOD requirements is a challenging costly and cumbersome task of cross-domain nature;

The MID Region eTOD implementation strategy is detailed below:

1) the eTOD implementation should be in compliance with ICAO provisions contained in Annex 15 and Doc 9881;

2) the eTOD implementation should be based on national plans/roadmaps;

3) eTOD implementation should be managed by each State as a national eTOD programme supported by necessary resources, a high level framework and a detailed planning including priorities and timelines for the implementation of the programme;

4) States should adopt/follow a collaborative approach involving all concerned parties in the implementation of eTOD provisions and establish a multi-disciplinary team defining clearly the responsibilities and roles of the different Administrations within and outside the Civil Aviation Authority in the implementation process (AIS, Aerodromes, Military, National Geographic and Topographic Administrations/ Agencies, etc);

5) eTOD requirements should be analyzed and a common understanding of these requirements should be developed;

6) States should make an inventory and evaluate the quality of existing terrain and obstacle data sources and in the case of data collection, consider carefully the required level of details of collected terrain and obstacle data with particular emphasis on obstacle data and associated cost;

7) States should carry out theoretical studies of candidate techniques for data acquisition (photogrammetry, LIDAR, etc) based on a Cost-Benefit Analysis and supported by case study for a representative aerodrome;

8) in the development of their eTOD programme, States should take into consideration the requirements for update/maintenance of data, especially the obstacle data;

9) States, while maintaining the responsibility for data quality and availability, should consider to which extent provision of electronic terrain and obstacle data could be delegated to national geodetic Institutes/Agencies, based on Service Level Agreement reflecting such delegation. Collaboration between States and data providers/integrators should also be considered;

10) ICAO and States should undertake awareness and training programmes to promote and expedite the eTOD implementation;

11) implementation of eTOD provisions should be considered as a global matter, which necessitates coordination and exchange of experience between States, ICAO and other national/international organizations involved;

12) to the extent possible, States should work co-operatively especially with regard to the cross-border issue, for the sake of harmonization and more efficient implementation of eTOD; and

13) States encountering difficulties for the implementation of eTOD may seek assistance from ICAO, through a TCB project, and/or from other States.

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eTOD WG/2
Appendix 4D to the Report on Agenda Item 4

Proposal for Amendment to the MID Basic ANP (Doc 9708)

for the introduction of a new Section related to eTOD

World Geodetic System – 1984 (WGS-84)

…

5.9 In order to ensure that quality (accuracy, resolution and integrity) and traceability requirements for the WGS-84 related geographical coordinate data are met, States must take measures to develop and introduce a quality system programme. This programme containing procedures, processes and resources should be in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards.

(Insert the following new Text)

Electronic Terrain and Obstacle Data (eTOD) Requirements

(FASID Table AIS 9)

6.1 Recognizing that significant safety benefits for international civil aviation will be provided by in-flight and ground-based applications that rely on quality electronic Terrain and Obstacle Data (eTOD), States should make every effort to implement the eTOD provisions in accordance with Chapter 10 of Annex 15 and Doc 9881.

6.2 FASID Table AIS-X sets out the requirements for the provision of Electronic Terrain and Obstacle Data (eTOD) to be provided by States.

6.3 The implementation of eTOD should involve different Administrations within and outside the Civil Aviation Authority i.e.: AIS, Aerodromes, Military, National Geographic and Topographic Administrations/Agencies, procedure designers, etc.

6.4 States, while maintaining the responsibility for data quality and availability, should consider to which extent the provision of electronic terrain and obstacle data could be delegated to national geodetic Institutes/Agencies, based on Service Level Agreement reflecting such delegation.

6.5 States should consider carefully the required level of details of collected terrain and obstacle data with particular emphasis on obstacle data and associated cost.

6.6 States should take into consideration the requirements for update/maintenance of data, especially related to obstacles.

6.7 States should work co-operatively with regard to the cross-border issue, for the sake of harmonization and more efficient implementation of eTOD.

(Renumber the following paragraphs)

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eTOD WG/2
Appendix 4E to the Report on Agenda Item 4

FASID TABLE AIS-9 — eTOD REQUIREMENTS

EXPLANATION OF THE TABLE

Column

1 Name of the State, territory or aerodrome for which electronic Terrain and Obstacle Data (eTOD) are required with the designation of the aerodrome use:

RS — international scheduled air transport, regular use
RNS — international non-scheduled air transport, regular use
RG — international general aviation, regular use
AS — international scheduled air transport, alternate use

2 Runway designation numbers

3 Type of each of the runways to be provided. The types of runways, as defined in Annex 14, Volume 1, Chapter I, are:

NINST — non-instrument runway;
NPA — non-precision approach runway
PA1 — precision approach runway, Category I;
PA2 — precision approach runway, Category II;
PA3 — precision approach runway, Category III.

4 Requirement for the provision of Terrain data for Area 1, shown by an ‘‘X’’ against the State or territory to be covered.

5 Requirement for the provision of Terrain data for Area 2 (TMA), shown by an ‘‘X’’ against the aerodrome to be covered.

6 Requirement for the provision of Terrain data for Area 2 (45 Km radius from the ARP), shown by an ‘‘X’’ against the aerodrome to be covered.

7 Requirement for the provision of Terrain data for Area 3, shown by an ‘‘X’’ against the aerodrome to be covered.

8 Requirement for the provision of Terrain data for Area 4, shown by an ‘‘X’’ against the runway threshold to be covered.

9 Requirement for the provision of Obstacle data for Area 1, shown by an ‘‘X’’ against the State or territory to be covered.

10 Requirement for the provision of Obstacle data for Area 2 (TMA), shown by an ‘‘X’’ against the aerodrome to be covered.

11 Requirement for the provision of Obstacle data for Area 2 (45 Km radius from the ARP), shown by an ‘‘X’’ against the aerodrome to be covered.

12 Requirement for the provision of Obstacle data for Area 3, shown by an ‘‘X’’ against the aerodrome to be covered.

13 Remarks (timetable for implementation)

Note: For Columns 4 to 12 use the following symbols:
X- Required but not implemented
XI- Required and implemented

eTOD Requirements (MID FASID Table AIS-9)

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
AFGHANISTAN			X					X				
(OAKB) KABUL/Kabul Int'l				X		X			X		X	
RS	11 29	NPA PA1										
(OAKN) KANDAHAR/Kandahar Int'l												
AS	05 23	NPA NPA										
BAHRAIN			X					X				
(OBBI) Bahrain/Bahrain Int'l.				X		X			X		X	
RS	12L 30R	PA2 PA2										
	12R 30L	NPA NPA										
EGYPT			X					X				
(HEAR) EL-ARISH/El-Arish Int'l				X		X			X		X	
AS	16 34	NPA NPA										
(HEAT) ASYUT/Asyut Int'l				X		X			X		X	
AS	13 31	NPA NPA										
(HEAX) ALEXANDRIA/Alexandria Int'l				X		X			X		X	
RS	18 36	NPA NPA										
	04 22	NPA NPA										

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
(HEAZ) CAIRO/Almaza Int'l				X		X			X		X	
ANS	18	NPA										
	36	NPA										
	05	NINST										
	23	NINST										
(HEBA) ALEXANDRIA/Borg El-Arab Int'l				X		X			X		X	
RS	14	PA1										
	32	NPA										
(HECA) CAIRO/Cairo Int'l				X		X			X		X	
RS	05L	PA2					X					
	23R	PA2					X					
	05R	PA2					X					
	23L	PA2					X					
	16	NINST										
	34	NINST										
(HEGN) HURGADA/Hurghada Int'l				X		X			X		X	
RS	16	NPA										
	34	PA1										
(HELX) LUXOR/Luxor Int'l				X		X			X		X	
RS	02	NPA										
	20	PA1										
(HEMA) MARSA ALAM/ Marsa Alam Int'l				X		X			X		X	
RNS	15	NPA										
	33	NPA										
(HEOW) SHARK EL OWEINAT/Shark El-Oweinat Int'l				X		X			X		X	
AS	01	NPA										
	19	NINST										
(HEPS) PORT SAID/Port Said Int'l				X		X			X		X	
AS	10	NPA										
	28	NPA										

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
(HESC) ST. CATHERINE/ St. Catherine Int'l				X		X			X		X	
RS	17 35	NPA NINST										
(HESH) SHARM-EL-SHEIKH/ Sharm-El-Sheikh Int'l				X		X			X		X	
RS	04L 22R 04R 22L	PA1 NPA NPA NPA										
(HESN) ASWAN/Aswan Int'l				X		X			X		X	
RS	17 35	NPA PA1										
(HETB) TABA/Taba Int'l				X		X			X		X	
AS	04 22	NPA NINST										
IRAN			X					X				
(OIKB) BANDAR ABBASS/ Bandar Abbas Int'l					X	X				X	X	
RS	03R 21L 03L 21R	NPA PA1 NINST NINST										
(OIFM) Esfahan/ Shahid Beheshti Int'l					X	X				X	X	
RS	08L 26R 08R 26L	NPA PA1 NPA NPA										
(OIMM) Mashhad/ Shahid Hashemi Nejad Int'l					X	X				X	X	
RS	13L 31R 13R 31L	NPA PA1 NPA NPA										
(OISS) Shiraz/Shahid Dastghaib Int'l					X	X				X	X	
RS	11R 29L 11L 29R	NPA PA1 NPA NPA										

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
(OITT) Tabriz/Tabriz Int'l					X	X				X	X	
RNS	12L 30R 12R 30L	NPA PA1 NINST NINST										
(OIII) Tehran/ Mehrabad Int'l				X		X			X		X	
RS	11R 29L 11L 29R	NPA PA1 NPA NPA										
(OIIE) TEHRAN/Imam Khomaini Int'l					X	X				X	X	
RS	11 29	NPA PA2					X					
(OIZH) ZAHEDAN/Zahedan				X	X				X	X		
Int'l RS	17 35	NPA PA1										
IRAQ			X					X				
(ORBI) BAGHDAD/Baghdad				X		X			X		X	
Int'l. RS	15L 33R	NINST NINST					X X					
	15R 33L	NINST NINST										
(ORMM) BASRAH/Basrah Int'l.				X		X			X		X	
RS	14 32	NINST NINST					X X					
(ORER) ERBIL/Erbil Int'l												
RS												
(ORSU) SULYMANIYAH/ Sulymaniyah Int'l												
RS												
(ORNI) AL NAJAF/ Al Najaf Int'l (non operational).												
RS												

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
ISRAEL			X					X				
(LLET) EILAT/Eilat				X		X			X		X	
RNS	03 21	NPA NINST										
(LLHA) HAIFA/Haifa				X		X			X		X	
RNS	16 34	NINST NINST										
(LLOV) OVDA/Ovda Int'l				X		X			X		X	
RNS	02L 20R	NINST NPA										
(LLBG) TEL AVIV/ Ben Gurion				X		X			X		X	
RS	03 21 08 26 12 30	NPA NINST NPA PA1 PA1 NPA										
(LLSD) TEL AVIV/ Sde-Dov				X		X			X		X	
RNS	03 21	NINST NINST										
JORDAN			XI					XI				
(OJAI) Amman/				X		X			X		X	
Queen Alia Int'l RS	08R 26L 08L 26R	NPA PA2 PA2 PA2					X X X					
(OJAM) Amman/Marka Int'l				X		X			X		X	
AS	06 24	NPA PA1										
(OJAQ) AQABA/King					X	X				X	X	
Hussein Int'l RS	01 19	PA1 NPA										
(OJJR) JERUSALEM/ Jerusalem (Non operational)					X	X				X	X	
RS	12 30	PA1 NPA										

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
KUWAIT			X					X				
(OKBK) Kuwait Int'l				X		X			X		X	
RS	33L 15R 33R 15L	PA2 PA2 PA2 PA2					X X X X					
LEBANON			X					X				
(OLBA) BEIRUT/ R.B.H-Beirut Int'l				X		X			X		X	
RS	17 35 16 34 03 21	PA1 NINST PA1 NINST PA1 PA1										
OMAN			X					X				
(OOMS) Muscat/ Muscat Int'l				X		X			X		X	
RS	08 26	PA1 PA1										
(OOSA) SALALAH/Salalah Int'l				X		X			X		X	
AS	07 25	NPA PA1										
QATAR			X					X				
(OTBD) DOHA/Doha Int'l				X		X			X		X	
RS	34 16	PA2 PA1					X					
(OTxx) DOHA/New Doha Int'l (Future)												
RS												
SAUDI ARABIA			X					X				
(OEDF) DAMMAM/King Fahd Int'l				X		X			X		X	
RS	16L 34R 16R 34L	PA1 PA1 PA1 PA1										

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
(OEJN) JEDDAH/King Abdulaziz Int'l				X		X			X		X	
RS	16R 34L 16C 34C 16L 34R	PA2 PA2 PA2 PA2 PA1 PA1					X X X X					
(OEMA)MADINAH/Prince Mohammad Bin Abdulaziz				X		X			X		X	
RS	17 35 18 36	PA1 PA1 NPA PA1										
(OERK) RIYADH/King Khalid Int'l				X		X			X		X	
RS	15L 33R 15R 33L	PA1 PA1 PA1 PA1										
SYRIA			X					X				
(OSAP) ALEPPO/Aleppo Int'l				X		X			X		X	
RS	09 27	PA2 PA2					X X					
(OSLK) LATTAKIA/Bassel Al-Assad				X		X			X		X	
RS	17 35	NPA PA1										
(OSDI) DAMASCUS/Damascus Int'l				X		X			X		X	
RS	05L 23R	PA2 PA2					X X					
	05R 23L	PA2 PA2					X X					

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
UNITED ARAB EMIRATES			X					X				
(OMAA) ABU DHABI/ Abu Dhabi Int'l				X		X			X		X	
RS	13R 31L 13L 31R	PA1 PA3 PA3 PA3					X X X					
(OMAL) AL AIN/ Al Ain Int'l				X		X			X		X	
RS	01 19	PA1 NPA										
(OMDB) DUBAI/ Dubai Int'l				X		X			X		X	
RS	12L 30R 12R 30L	PA3 PA3 PA1 PA1					X X					
(OMFJ) FUJAIRAH/Fujairah Int'l				X		X			X		X	
RS	11 29	NPA PA1										
(OMRK) RAS AL KHAIMAH/ Ras Al Khaimah Int'l				X		X			X		X	
RS	16 34	NPA PA1										
(OMSJ) SHARJAH/ Sharjah Int'l				X		X			X		X	
RS	12 30	PA1 PA2					X					
(OMJA) DUBAI/ Jabel Ali Int'l (Future)												
RS	12L 30R 12R 30L	PA3 PA3 PA3 PA3					X X X X					

STATE, TERRITORY OR AERODROME FOR WHICH eTOD IS REQUIRED			TERRAIN DATA REQUIRED					OBSTACLE DATA REQUIRED				REMARKS
CITY/AERODROME	RWY No	RWY TYPE	Area 1	Area 2		Area 3	Area 4	Area 1	Area 2		Area 3	
				TMA	45 Km				TMA	45 Km		
1	2	3	4	5	6	7	8	9	10	11	12	13
YEMEN			X					X				
(OYAA) ADEN/ Aden Int'l				X		X			X		X	
RS	08 26	NPA PA1										
(OYHD) HODEIDAH/ Hodeidah Int'l				X		X			X		X	
RS	03 21	NPA NPA										
(OYRN) MUKALLA/Riyan				X		X			X		X	
RS	06 24	NPA NPA										
(OYSN) SANA'A/Sana'a Int'l				X		X			X		X	
RS	18 36	PA1 NPA										
(OYTZ) TAIZ/ Ganad				X		X			X		X	
RS	01 19	NPA NPA										

REPORT ON AGENDA ITEM 5: FUTURE WORK PROGRAMME

5.1 The meeting recalled that MIDANPIRG/10, under Decision 10/58 established the eTOD Working Group, with a view to, inter-alia, harmonize, coordinate and support the eTOD implementation activities on a regional basis.

5.2 The meeting noted that MIDANPIRG/11, through Decision 11/45, agreed to the revised Terms of Reference of the eTOD WG as at **Appendix 5A** to the Report on Agenda Item 5. It was highlighted that the work of the eTOD Working Group shall be carried out mainly through exchange of correspondence (email, facsimile, Tel, etc) between its Members. In this regard, the meeting was of view that States should make use of the ICAO MID Forum for the exchange of information and sharing of experience related to eTOD.

5.3 Noting that the majority of the Tasks assigned to the eTOD WG have been completed and taking into consideration that the applicability dates for the implementation of eTOD provisions related to Area 1 and Area 4, which is 20 November 2008 was passed, the meeting agreed to dissolve the eTOD Working Group and include the remaining eTOD tasks which have not yet been completed into the Work Programme of the AIS/MAP Task Force. Accordingly, the meeting agreed to the following Draft Decision:

DRAFT DECISION 2/4: DISSOLUTION OF THE eTOD WORKING GROUP

That, noting that the majority of the Tasks assigned to the eTOD Working Group have been completed:

a) the eTOD Working Group is dissolved; and

b) the eTOD tasks which have not yet been completed be included into the Work Programme of the AIS/MAP Task Force.

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eTOD WG/2
Appendix 5A to the Report on Agenda Item 5

MID REGION ELECTRONIC TERRAIN AND OBSTACLE DATA WORKING GROUP (eTOD WG)

A) TERMS OF REFERENCE

With a view to harmonize, coordinate and support the eTOD implementation activities on a regional basis, the MID Region eTOD Working Group shall:

1) analyse the eTOD requirements and develop a common understanding of these requirements (clarify the needs in terms of data format, temporality, cross-border harmonization and develop associated guidelines as required);

2) recommend the way forward the eTOD timely implementation;

3) develop and maintain a MID Region eTOD implementation strategy;

4) guide the development and support the roll-out of an awareness campaign for eTOD implementation within MID States;

5) carry out a theoretical study of candidates techniques for electronic Terrain and Obstacle Data acquisition including a cost benefit analysis;

6) develop a high level MID Region business case for eTOD implementation;

7) carry out a study case for a representative aerodrome from the MID Region;

8) assist States in the development of mandate/policy pertaining to the implementation of eTOD requirements;

9) develop an action plan for the implementation of eTOD requirements in the MID Region;

10) monitor the cost-conscious and timely implementation of eTOD requirements in the MID Region;

11) monitor and review latest developments pertaining to eTOD; and

12) develop its work programme within the scope of its Terms of Reference.

B) COMPOSITION

The eTOD Working Group will be composed of Experts nominated by Middle East Provider States from different technical areas within and outside the Civil Aviation Authority (AIS/MAP, Aerodrome, Military, Procedure Designers, ATC, Navigators, surveyors, National Geographic Administration/Agency, etc).

ICAO, IATA and IFALPA are Observers.

Other representatives from industry and user Organizations having a vested interest in Aeronautical Information Services and eTOD in particular could participate in the work of this Working Group.

C) WORKING ARRANGEMENTS

The eTOD Working Group shall report to the AIS/MAP Task Force.

The work of the eTOD Working Group shall be carried out mainly through exchange of correspondence (email, facsimile, Tel, etc) between its Members. The Working Group shall meet as required and at least once a year. The convening of the Working Group meetings should be initiated by the Rapporteur in coordination with the Members of the Group and ICAO MID Regional Office.

REPORT ON AGENDA ITEM 6: ANY OTHER BUSINESS

6.1 Nothing has been discussed under this Agenda Item.

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eTOD WG/2
Attachment A to the Report

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