

SESAR		Active							ECAC+	
INF07		Electronic Terrain and Obstacle Data (eTOD)								
REG	ASP	MIL	APO	USE	INT	IND	NM	MET	AIS	USP

Subject matter and scope

This objective has been introduced in order to aid the States in establishing a robust framework that will ensure the timely provision of electronic terrain and obstacle data (TOD)

ICAO Annex 15, Aeronautical Information Services, and ICAO Doc. 10066 PANS-AIM requires the States to provide TOD for their own territory and to announce it in the national AIPs. TOD is sub-divided into four areas:

- Area 1 - the entire territory of a State
- Area 2 - the terminal control area
- Area 3 - aerodromes/heliport area
- Area 4 - CAT II or CAT III operation area

States need to assess the existing national regulations and policies, including the safeguarding of aerodromes and obstacle permission processes, in order to evaluate their suitability in relation to the electronic terrain and obstacle data requirements of ICAO Annex 15 and PANS-AIM and to allocate responsibilities.

In addition, States will need to create capabilities for the origination, collection, exchange, management and distribution of the digital terrain and obstacle information in the form of digital datasets. This implies the establishment of efficient and reliable processes (e.g. data acquisition, cross-border provision, data validation and verification, data maintenance, data storage, data transmission, and oversight, etc.) ensuring the provision of up-to-date data which meets the operational requirements in support of an enhanced overall situational awareness and separation assurance and at the same time complies with the requirements of EU Regulation 73/2010 on the quality of aeronautical data and aeronautical information for the Single European Sky.

The operational capability dates given for this objective are not meant to replace, amend or modify in any way the deadline for implementation of the ICAO Annex 15/and PANS-AIM requirements for electronic terrain and obstacle data (TOD). The aim of this objective is to ensure that all States of the ECAC area provide the required TOD as soon as possible in line with the ICAO Annex 15/and PANS-AIM.

NOTE FOR MILITARY AUTHORITIES: It is the responsibility of each military authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the military authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to military authorities.

NOTE: EU Regulation 73/2010 has been replaced by COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010

Applicability Area(s) & Timescale(s)

Applicability Area		All ECAC+ States except: Maastricht UAC			
Timescales:		From:	By:	Applicable to:	
Initial operational capability		01/11/2014		Applicability Area	
Full operational capability			31/12/2018	Applicability Area	

References

European ATM Master Plan

OI step -	- No OI Link -									
	Enablers -	AIMS-16								

Legend:	WXYZ-001	Covered by SLoA(s) in this objective	WXYZ-002 zzz	Covered by SLoA(s) in another objective Objective covering the enabler	WXYZ-003	Not covered in the Implementation Plan
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Applicable legislation

COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010; EU Regulation 139/2014 - Requirements and administrative procedures related to aerodromes	
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INF07	Electronic Terrain and Obstacle Data (eTOD)
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Essential Operational Changes

Digital AIM and MET Services

SESAR Solution

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ICAO GANP - ASBUs

DAIM-B1/3	Provision of digital terrain data sets
DAIM-B1/4	Provision of digital obstacle data sets

Deployment Programme

- none -	
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European Plan for Aviation Safety

RMT.0703	Runway Safety
RMT.0722	Provision of aeronautical data by the aerodrome operator

Operating Environments

Airport
Terminal Airspace

Stakeholder Lines of Action (SLoAs)

SloA ref.	Title	From	By
INF07-REG01	Establish National TOD policy	01/11/2014	01/01/2019
INF07-REG02	Establish TOD regulatory framework	01/05/2015	01/01/2019
INF07-REG03	Establish oversight of TOD implementation	01/06/2015	01/01/2019
INF07-REG04	Verify the regulatory compliance of TOD implementation	01/12/2017	01/01/2019
INF07-ASP01	Plan the required activities for the collection, management and provision of TOD in accordance with national TOD policy	01/11/2014	01/01/2019
INF07-ASP02	Implement the collection, management and provision of TOD in accordance with the national TOD policy and regulatory framework	01/05/2015	01/01/2019
INF07-APO01	Plan the required activities for the collection, management and provision of TOD in accordance with national TOD policy	01/11/2014	01/01/2019
INF07-APO02	Implement the collection, management and provision of TOD in accordance with the national TOD policy and regulatory framework	01/05/2015	01/01/2019

Description of finalised and deleted SLoAs is available on the eATM Portal @ https://www.eatmportal.eu/working/depl/essip_objectives

Expected Performance Benefits

Safety:	The availability of quality-assured electronic terrain and obstacle data from the State's authoritative sources will significantly improve situational awareness with respect to terrain or obstacle hazards, separation assurance and the visualization of approaches in challenging terrain environments, and thereby contribute to increased safety levels and performance in airborne and ground-based systems (e.g. EGPWS, MSAW, APM, SVS, A-SMGCS and Instrument Procedure Design).
Capacity:	-
Operational Efficiency:	-
Cost Efficiency:	-
Environment:	-
Security:	-

Detailed SLoA Descriptions

INF07-REG01	Establish National TOD policy	From:	By:
		01/11/2014	01/01/2019
Action by:	State Authorities		

INF07	Electronic Terrain and Obstacle Data (eTOD)		
Description & purpose:	<p>In close coordination with ANSPs, airport operators and other organisations or bodies relevant in the TOD processes to establishing commonly agreed national TOD policy and implementation programmes, setting up the necessary steps to enable the provision of electronic terrain and obstacle data. The national TOD policy, being a binding document for TOD stakeholders, should include, as a minimum:</p> <ul style="list-style-type: none"> - TOD affected stakeholders within the State, their roles and responsibilities (cost recovery models, where appropriate) for TOD origination, collection, verification, validation, management and provision; - TOD to be made available, including the survey requirements based on the data quality requirements, methods for verification and validation and delivery formats; - list of aerodromes where Area 2, 3 and 4 TOD would be provided; - the milestones and tasks of the TOD stakeholders and implementation timeline; - the list of rules/regulations constituting the TOD regulatory framework that would require to be developed or updated; - where appropriate, principles for exchange and harmonisation of the common TOD with neighbouring States. 		
Supporting material(s):	<p>EUROCONTROL - GUID-158 - Terrain and Obstacle Data Manual (TOD) - Edition 3 / 05/2021 Url : https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual EC - REGULATION (EU) 2020/469 of 14 February 2020 - COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010. 01/2010 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0469 EC - EU Regulation 139/2014 Requirements and administrative procedures related to aerodromes ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/ ICAO - Annex 4 - Aeronautical charts Url : https://store.icao.int/ ICAO - Annex 14 - Aerodromes, Volume I and II Url : https://store.icao.int/ ICAO - Doc 9137-Part 6 - Airport Services Manual - Part 6 - Control of Obstacles - Edition 2 / 12/1983 Url : https://store.icao.int/ EUROCONTROL - National TOD Policy template ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/ EASA - Acceptable Means of Compliance and Guidance Material to Regulation (EU) No 139/2014 Url : https://www.easa.europa.eu/document-library/acceptable-means-of-compliance-and-guidance-materials/group/adr---aerodromes#group-table ICAO - Doc 10066 - Air Navigation Procedures for Aeronautical Information Management Url : https://store.icao.int/</p>		
Finalisation criteria:	1 - In coordination with relevant TOD stakeholders, national TOD policy and implementation programme is established		
INF07-REG02	Establish TOD regulatory framework	From:	By:
		01/05/2015	01/01/2019
Action by:	State Authorities		
Description & purpose:	<p>- Establish the TOD regulatory framework based on National TOD Policy (REG01) through the development or updating of the national rules and regulations affecting the provision of TOD (e.g. suitability of the existing national safeguarding policy for obstacle development in all four areas in relation to electronic obstacle data requirements or origination responsibilities and processes).</p> <p>- Where appropriate, changes to State legislation should be initiated to ensure timely implementation.</p>		

INF07	Electronic Terrain and Obstacle Data (eTOD)		
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Supporting material(s):	<p>EUROCONTROL - GUID-158 - Terrain and Obstacle Data Manual (TOD) - Edition 3 / 05/2021 Url : https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual</p> <p>EC - REGULATION (EU) 2020/469 of 14 February 2020 - COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010. 01/2010 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0469</p> <p>EC - COMMISSION IMPLEMENTING REGULATION (EU) 2017/373 - (OJ L 62, 8.03.2017, p. 1) - COMMISSION IMPLEMENTING REGULATION (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011 03/2017 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0373&from=EN</p> <p>EC - EU Regulation 139/2014 Requirements and administrative procedures related to aerodromes ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/</p> <p>ICAO - Annex 4 - Aeronautical charts Url : https://store.icao.int/</p> <p>ICAO - Annex 14 - Aerodromes, Volume I and II Url : https://store.icao.int/</p> <p>ICAO - Doc 9137-Part 6 - Airport Services Manual - Part 6 - Control of Obstacles - Edition 2 / 12/1983 Url : https://store.icao.int/</p> <p>ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/</p> <p>EASA - Acceptable Means of Compliance and Guidance Material to Regulation (EU) No 139/2014 Url : https://www.easa.europa.eu/document-library/acceptable-means-of-compliance-and-guidance-materials/group/adr---aerodromes#group-table</p> <p>ICAO - Doc 10066 - Air Navigation Procedures for Aeronautical Information Management Url : https://store.icao.int/</p>		
Finalisation criteria:	1 - The TOD regulatory framework based on National TOD Policy (REG01) is established 2 - Change process to state legislation is initiated as required		
INF07-REG03	Establish oversight of TOD implementation	From: 01/06/2015	By: 01/01/2019
Action by:	State Authorities		
Description & purpose:	The regulatory oversight of TOD implementation for data origination, collection, verification and validation, management and provision based on the national TOD policy and regulatory framework.		
Supporting material(s):	<p>EUROCONTROL - GUID-158 - Terrain and Obstacle Data Manual (TOD) - Edition 3 / 05/2021 Url : https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual</p> <p>EC - REGULATION (EU) 2020/469 of 14 February 2020 - COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010. 01/2010 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0469</p> <p>ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/</p> <p>ICAO - Annex 4 - Aeronautical charts Url : https://store.icao.int/</p> <p>ICAO - Annex 14 - Aerodromes, Volume I and II Url : https://store.icao.int/</p> <p>ICAO - Doc 9734 - Safety Oversight Manual - Edition 2 Url : https://store.icao.int/</p> <p>ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/</p>		
Finalisation criteria:	1 - State TOD oversight plan, including all TOD affected stakeholders, in accordance with the national TOD policy and regulatory framework is established 2 - Procedures are established for the national supervision of the ongoing TOD operation.		
INF07-REG04	Verify the regulatory compliance of TOD implementation	From: 01/12/2017	By: 01/01/2019
Action by:	State Authorities		

INF07	Electronic Terrain and Obstacle Data (eTOD)		
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Description & purpose:	The verification of compliance with the regulatory TOD requirements through oversight and acceptance of TOD implementation for data origination, collection, verification and validation, management and provision based on the international TOD requirements and the national TOD regulatory framework.		
Supporting material(s):	<p>EUROCONTROL - GUID-158 - Terrain and Obstacle Data Manual (TOD) - Edition 3 / 05/2021 Url : https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual</p> <p>EC - REGULATION (EU) 2020/469 of 14 February 2020 - COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010. 01/2010 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0469</p> <p>ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/</p> <p>ICAO - Annex 4 - Aeronautical charts Url : https://store.icao.int/</p> <p>ICAO - Annex 14 - Aerodromes, Volume I and II Url : https://store.icao.int/</p> <p>ICAO - Doc 9734 - Safety Oversight Manual - Edition 2 Url : https://store.icao.int/</p> <p>ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/</p> <p>ICAO - Doc 10066 - Air Navigation Procedures for Aeronautical Information Management Url : https://store.icao.int/</p>		
Finalisation criteria:	1 - Implementation of TOD is verified through oversight and acceptance and corrective action where required		
INF07-ASP01	Plan the required activities for the collection, management and provision of TOD in accordance with national TOD policy	From: 01/11/2014	By: 01/01/2019
Action by:	ANS Providers		
Description & purpose:	<p>In close coordination with the State authorities and related TOD stakeholders, analyse the current environment and develop a plan/roadmap demonstrating the feasibility of achieving the necessary steps to enable the collection (where applicable), management and provision of electronic terrain and obstacle data in accordance with the national TOD policy. The implementation planning should cover the following topics, as applicable:</p> <ul style="list-style-type: none"> - System change; - Change management; - Process development; - Migration of processes and data; - Data validation and verification; - Financial and human resources; - Performance monitoring; - Risk management; - Compliance management; - Training 		
Supporting material(s):	<p>EUROCONTROL - GUID-158 - Terrain and Obstacle Data Manual (TOD) - Edition 3 / 05/2021 Url : https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual</p> <p>EC - REGULATION (EU) 2020/469 of 14 February 2020 - COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010. 01/2010 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0469</p> <p>ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/</p> <p>ICAO - Annex 4 - Aeronautical charts Url : https://store.icao.int/</p> <p>ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/</p> <p>ICAO - Doc 10066 - Air Navigation Procedures for Aeronautical Information Management Url : https://store.icao.int/</p>		
Finalisation criteria:	1 - The availability of a plan/roadmap by the ANSP demonstrating the feasibility of implementation of TOD as defined by the national TOD policy in line with the national TOD implementation programme		
INF07-ASP02	Implement the collection, management and provision of TOD in accordance with the national TOD policy and regulatory framework	From: 01/05/2015	By: 01/01/2019
Action by:	ANS Providers		

INF07	Electronic Terrain and Obstacle Data (eTOD)		
Description & purpose:	Adjust the AIM system (i.e. people, equipment and procedures) to ensure the collection (where applicable), management and provision of TOD in accordance with the national TOD policy and regulatory framework.		
Supporting material(s):	ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/ ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/ ICAO - Doc 10066 - Air Navigation Procedures for Aeronautical Information Management Url : https://store.icao.int/		
ATM Master Plan relationship:	[AIMS-16]-Electronic Terrain and Obstacle Data (TOD)		
Finalisation criteria:	1 - The requirements defined in the national TOD policy and regulatory framework for ANSP are fulfilled in accordance with the national TOD implementation programme		
INF07-APO01	Plan the required activities for the collection, management and provision of TOD in accordance with national TOD policy	From:	By:
		01/11/2014	01/01/2019
Action by:	Airport Operators		
Description & purpose:	In close coordination with the State authorities and related TOD stakeholders, analyse the current environment and develop a plan/roadmap demonstrating the feasibility of achieving the necessary steps to enable the collection, management and provision of electronic terrain and obstacle data in accordance with the national TOD policy.		
Supporting material(s):	EUROCONTROL - GUID-158 - Terrain and Obstacle Data Manual (TOD) - Edition 3 / 05/2021 Url : https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual EC - REGULATION (EU) 2020/469 of 14 February 2020 - COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010. 01/2010 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0469 EC - EU Regulation 139/2014 Requirements and administrative procedures related to aerodromes ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/ ICAO - Annex 4 - Aeronautical charts Url : https://store.icao.int/ ICAO - Annex 14 - Aerodromes, Volume I and II Url : https://store.icao.int/ ICAO - Doc 9137-Part 6 - Airport Services Manual - Part 6 - Control of Obstacles - Edition 2 / 12/1983 Url : https://store.icao.int/ ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/ EASA - Acceptable Means of Compliance and Guidance Material to Regulation (EU) No 139/2014 Url : https://www.easa.europa.eu/document-library/acceptable-means-of-compliance-and-guidance-materials/group/adr---aerodromes#group-table ICAO - Doc 10066 - Air Navigation Procedures for Aeronautical Information Management Url : https://store.icao.int/		
Finalisation criteria:	1 - The availability of a plan/roadmap by the airport operator demonstrating the feasibility of implementation of TOD as defined by the national TOD policy in line with the national TOD implementation programme		
INF07-APO02	Implement the collection, management and provision of TOD in accordance with the national TOD policy and regulatory framework	From:	By:
		01/05/2015	01/01/2019
Action by:	Airport Operators		
Description & purpose:	Adjust the related airport operation system (i.e. people, equipment and procedures) to ensure the collection, management and provision of TOD in accordance with the national TOD policy and regulatory framework.		

INF07	Electronic Terrain and Obstacle Data (eTOD)
Supporting material(s):	<p>EUROCONTROL - GUID-158 - Terrain and Obstacle Data Manual (TOD) - Edition 3 / 05/2021 Url : https://www.eurocontrol.int/publication/eurocontrol-terrain-and-obstacle-data-manual</p> <p>EC - REGULATION (EU) 2020/469 of 14 February 2020 - COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010. 01/2010 Url : https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0469</p> <p>EC - EU Regulation 139/2014 Requirements and administrative procedures related to aerodromes ICAO - Doc 9881 - Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information Url : https://store.icao.int/</p> <p>ICAO - Annex 4 - Aeronautical charts Url : https://store.icao.int/</p> <p>ICAO - Annex 14 - Aerodromes, Volume I and II Url : https://store.icao.int/</p> <p>ICAO - Doc 9137-Part 6 - Airport Services Manual - Part 6 - Control of Obstacles - Edition 2 / 12/1983 Url : https://store.icao.int/</p> <p>ICAO - Annex 15 - Aeronautical Information Services Url : https://store.icao.int/</p> <p>EASA - Acceptable Means of Compliance and Guidance Material to Regulation (EU) No 139/2014 Url : https://www.easa.europa.eu/document-library/acceptable-means-of-compliance-and-guidance-materials/group/adr---aerodromes#group-table</p> <p>ICAO - Doc 10066 - Air Navigation Procedures for Aeronautical Information Management Url : https://store.icao.int/</p>
ATM Master Plan relationship:	[AIMS-16]-Electronic Terrain and Obstacle Data (TOD)
Finalisation criteria:	1 - The requirements defined in the national TOD policy and regulatory framework for airport operators are fulfilled in accordance with the national TOD implementation programme