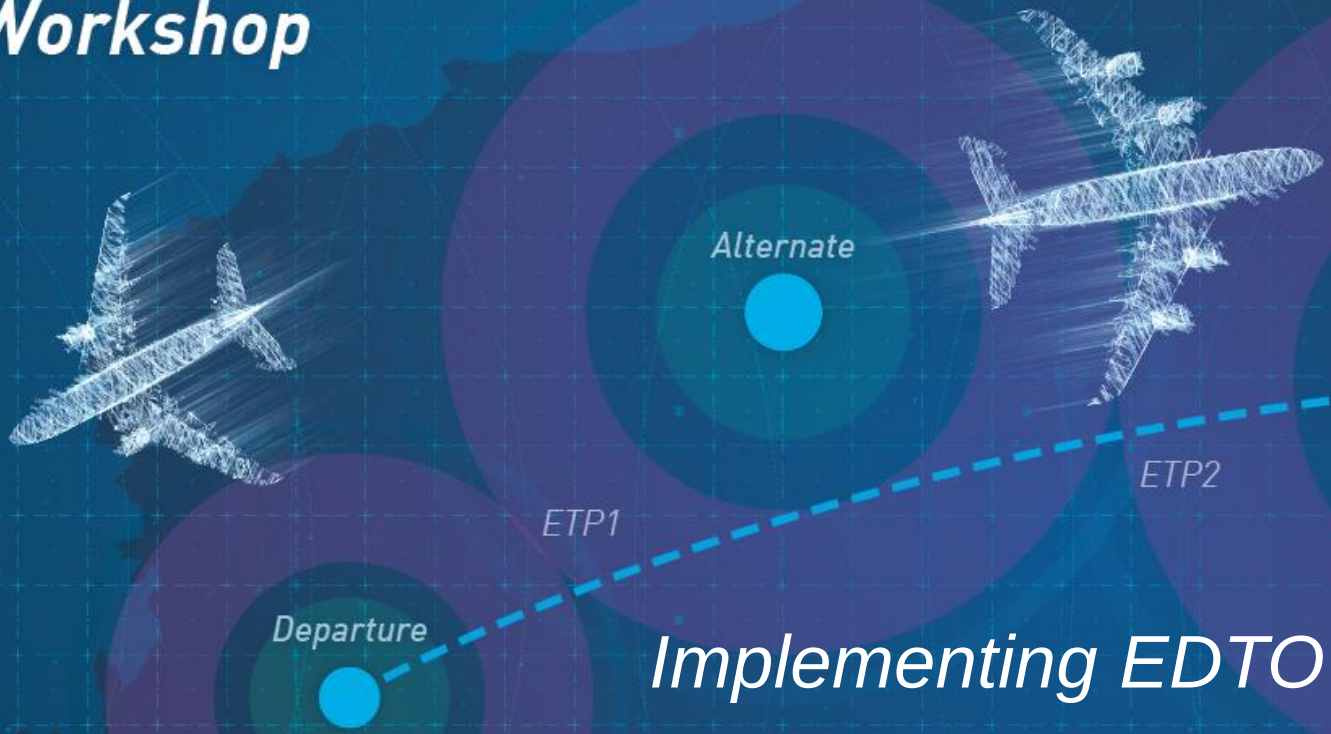
Extended Diversion Time Operations Workshop



Module 8

Implementing EDTO Regulations

ICAO

Proudly in partnership with

AIRBUS

BOEING

Course Structure

Module 1
Course Introduction

Module 2
EDTO Foundation

Module 3
Approval Process

Module 4
Type Design & Reliability Considerations

Module 5
Flight Operations Considerations

Module 6
Maintenance Considerations

Module 7
Continued Surveillance

Module 8
Implementing EDTO Regulations

Module 9
Assessment

Module 10 – Wrap Up

Objectives

At the end of this module, participants will be familiar with the process and technical considerations for implementing State EDTO regulations.

Module 8 - Outline

Part I — Summary of ICAO EDTO SARPS and Guidance

Part II — Responsibilities of Contracting States

Part III— Considerations for Establishing EDTO Regulations

Part IV— EDTO Gap Assessment Worksheet

Part V — Examples of State Implementations

Part VI— Practical Exercise

Primary EDTO Reference Materials

Standards:

Annex 6, Part 1 **Operation of Aircraft - International Commercial Air Transport - Aeroplanes**

Chapter 1:	Definitions
Section 4.7.1:	Requirements for operations beyond 60 minutes to an adequate aerodrome
Section 4.7.2:	Requirements for Extended Diversion Time Operations (EDTO)

Guidance Materials:

Annex 6, Part 1 **Operation of Aircraft - International Commercial Air Transport - Aeroplanes**

Attachment C:	Guidance for operations by turbine-engine aeroplanes beyond 60 minutes to an en-route alternate aerodrome, including extended diversion time operations (EDTO)

Doc 10085 **Extended Diversion Time Operations (EDTO) Manual**

(Attachment C content to be added in future revision)

Related EDTO Reference Materials

Standards:

Annex 6, Part 1 — Operation of Aircraft - International Commercial Air Transport - Aeroplanes

Section 4.3.4:	Alternate aerodromes
Section 4.3.6:	Fuel requirements
Section 4.3.10:	Time capability of cargo compartment fire suppression system
Appendix 2:	Organization and contents of an operations manual
Appendix 6:	Air operator certificate

Annex 6, Part II — Operation of Aircraft - International General Aviation - Aeroplanes

Section 4.3.4.7:	Additional requirements for operations beyond 60 minutes to an en-route alternate aerodrome *(recommendation)*

Related EDTO Reference Materials
Continued

Guidance Materials:

Annex 6, Part 1 — **Operation of Aircraft - International Air Transportation - Aeroplanes**

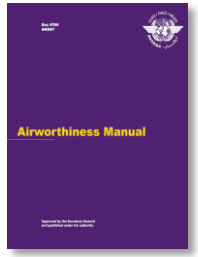
Attachment I: Rescue and fire-fighting service (RFFS) levels

Doc 9976 — **Flight Planning and Fuel Management Manual (FPFMM)**

Chapter 4: Understanding prescriptive compliance *(4.4, 4.6, 4.7, 4.8, 4.14, 4.15, 4.18, 4.21, 4.24, 4.27)*

Chapter 5: Performance based compliance *(Appendix 1, Appendix 7)*

Chapter 6: In-flight fuel management *(6.4, 6.6)*



Doc 9760 — **Airworthiness Manual, Part IV - State of the Operator**

Chapter 5: Airworthiness Requirements for Extended Diversion Time Operations

Chapter 6: Leasing Arrangements (6.4 - Approval for EDTO)

Module 8 - Outline

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Foreword

This section provides a review of ICAO contracting State responsibilities which is not unique to EDTO, but applies equally to EDTO as with all areas of the Standards related to establishing State regulations.

Contracting State Responsibilities

ICAO Doc 7300, Article 37
Adoption of international standards and procedures

Each contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures and organization… in all matters in which such uniformity will facilitate and improve air navigation.

To this end ICAO shall adopt and amend from time to time, as may be necessary, international standards and recommended practices and procedures…

Doc 7300
Chicago Convention

Contracting State Responsibilities

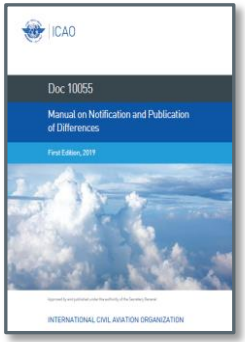
ICAO Doc 7300, Article 38

Departures from international standards and procedures

Any State which finds it impractical to comply in all respects with any such international standard or procedure, or to bring its own regulations or practices into full accord… shall give immediate notification to ICAO of the differences between its own practice and that established by the international standard...

ICAO Doc 10055, 'Manual on Notification and Publication of Differences' provides additional guidance for contracting States.

Doc 7300



Doc 10055

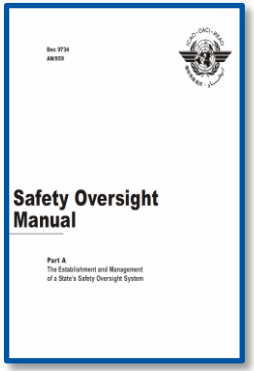
Contracting State Responsibilities

ICAO Doc 9734 - Safety Oversight Manual, Part A

3.3 Specific Operating Regulations

3.3.1 General requirements

The State laws and regulations should be in conformity with the Annexes to the Convention. The Annex provisions are designed to provide the *minimum requirements* to be met by all Contracting States, regardless of the size and complexity of their civil aviation activity …



Doc 9734, Part A

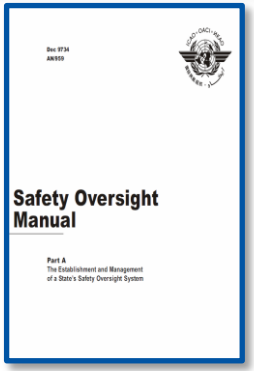
Contracting State Responsibilities

ICAO Doc 9734 - Safety Oversight Manual, Part A

3.3 Specific Operating Regulations

3.3.2 Adapting or adopting regulations from other States

To meet their requirements for regulations, Contracting States always have the option of **adopting** another Contracting State's regulations… (however) … A better alternative would be to **adapt** the regulations to meet the aviation environment while still maintaining harmony with other States.

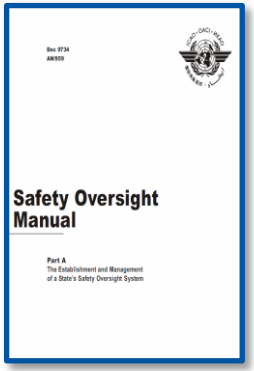


Doc 9734, Part A

Contracting State Responsibilities

ICAO Doc 9734 - Safety Oversight Manual, Part A

3.3 Specific Operating Regulations



Doc 9734, Part A

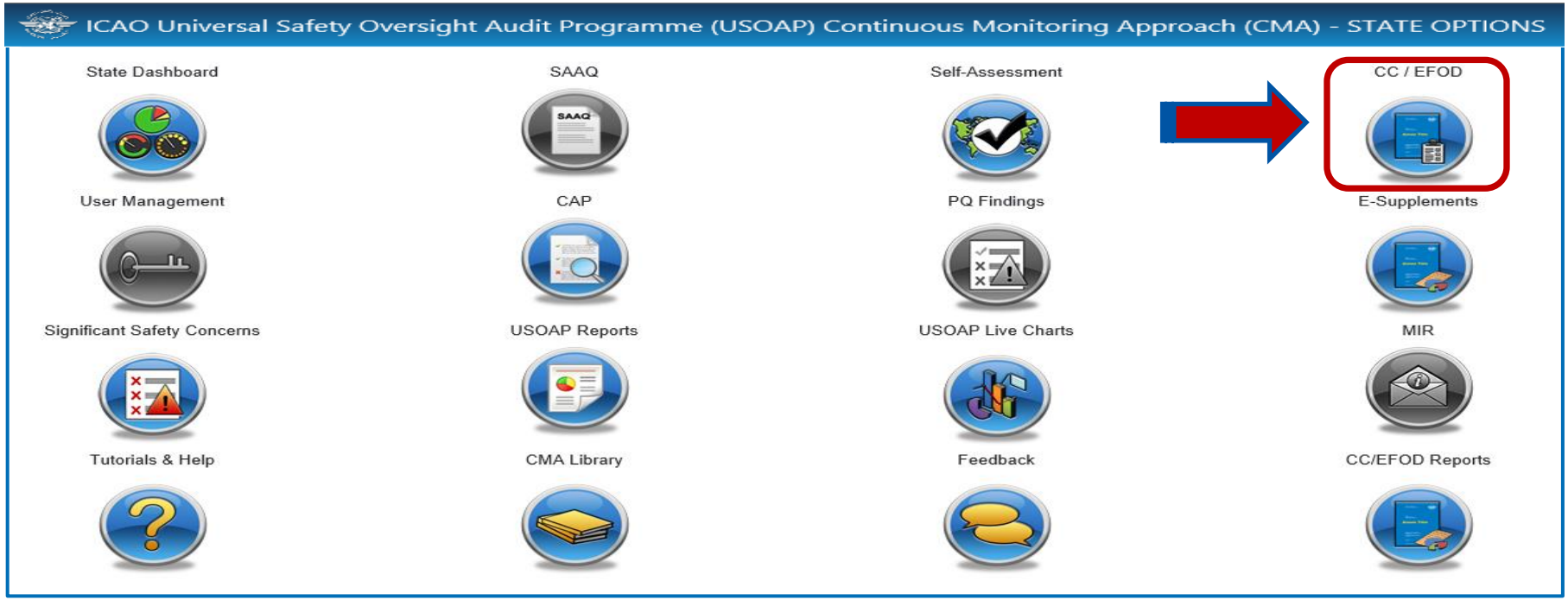
3.3.3 Differences between national regulations and ICAO Standards

Article 38 of the Convention specifies that if a State finds it impracticable to comply in all respects with any international Standards… or if it deems it necessary to adopt regulations or practices differing from those established by ICAO, it shall give immediate notification…

It should be noted, however, that the filing of differences with respect to international Standards does not mean that a State can continue to do business as usual…

Electronic Filing of Differences (EFOD)

USOAP CMA Portal https://soa.icao.int/usoap



Electronic Filing of Differences (EFOD)

State Compliance Status Categories:

- No Difference
- Not Applicable
- Significant Difference
  - A) More Exacting or Exceeds
  - B) Different in character or Other means of compliance
  - C) Less protective or partially implemented or not implemented

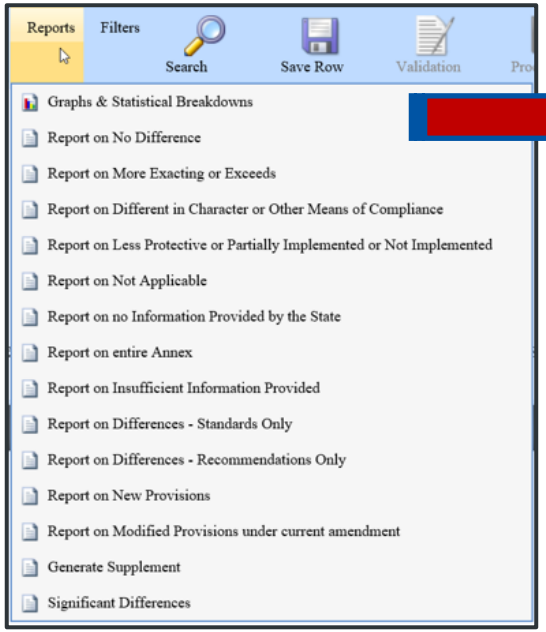
Text fields to be provided by State

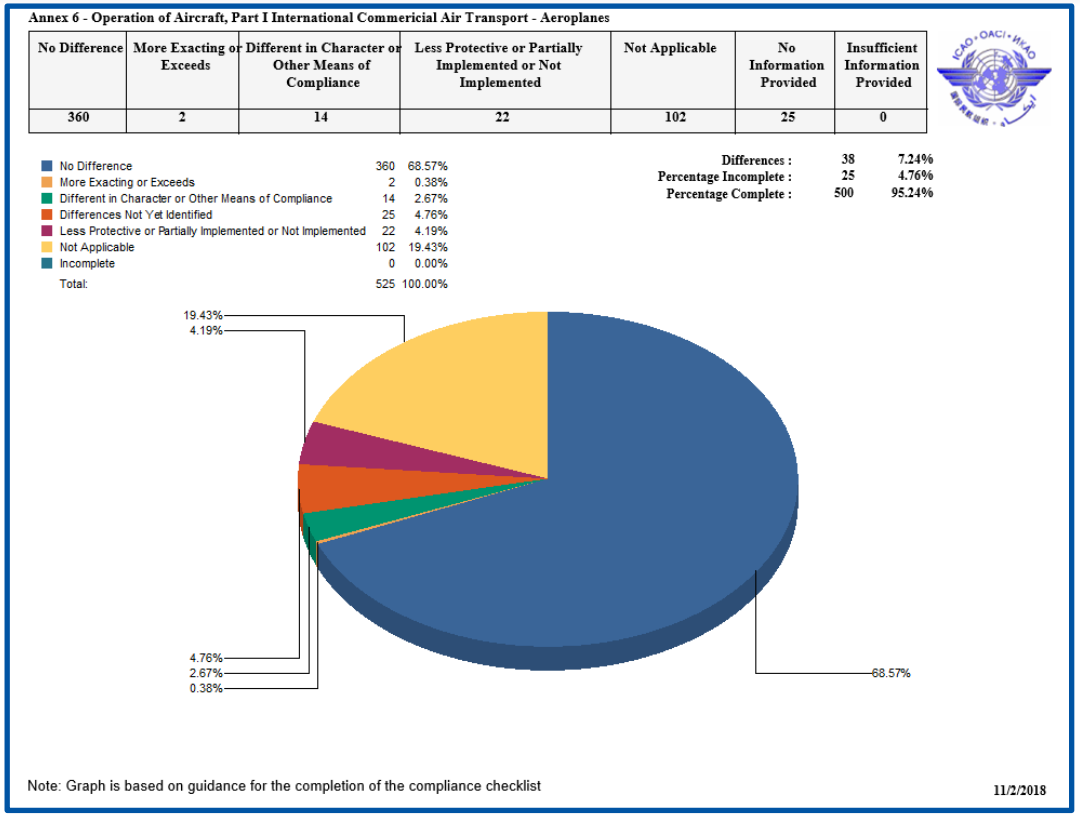
- State Reference
- Details of Difference (describe the difference clearly and concisely)
- Remarks (indicate reasons for difference and intentions including any planned implementation date)

Electronic Filing of Differences (EFOD)
Example Inputs

Electronic Filing of Differences (EFOD)

Report Options





Annex 6 - Operation of Aircraft, Part I International Commericial Air Transport - Aeroplanes

No Difference	More Exacting or Exceeds	Different in Character or Other Means of Compliance	Less Protective or Partially Implemented or Not Implemented	Not Applicable	No Information Provided	Insufficient Information Provided
360	2	14	22	102	25	0

No Difference	360	68.57%
More Exacting or Exceeds	2	0.38%
Different in Character or Other Means of Compliance	14	2.67%
Differences Not Yet Identified	25	4.76%
Less Protective or Partially Implemented or Not Implemented	22	4.19%
Not Applicable	102	19.43%
Incomplete	0	0.00%
Total:	525	100.00%

Differences :	38	7.24%
Percentage Incomplete :	25	4.76%
Percentage Complete :	500	95.24%

Note: Graph is based on guidance for the completion of the compliance checklist

11/2/2018

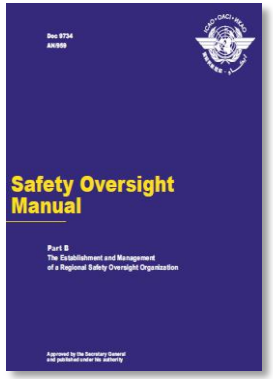
Module 8 Review Question

Q8.1 Which ICAO Critical Element (CE) of a Safety Oversight System requires contracting States to develop specific operating regulations?

- CE-3
- CE-6
- CE-5
- CE-2

Contracting State Responsibilities
Operational Approval and Oversight

Doc 9734: Safety Oversight Manual
Part 1, Chapter 3: 8 Critical Elements (CEs) of a Safety Oversight System



Doc 9734

Module 8 - Outline

Part I — Summary of ICAO EDTO SARPS and Guidance

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Part VI— Practical Exercise

Establishing State Regulations (CE-2)
General Considerations

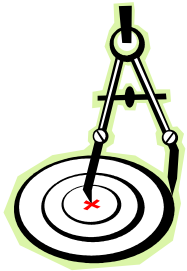
- State rulemaking process (as per **CE-1**, Primary Aviation Legislation)
  - Industry involvement (?), Public notification/comment (?)
- ICAO SARPS gap assessment
  - Compliance checklist (CC) and filing of differences (EFOD)
- Adopting/adapting other State regulations
- Supporting guidance materials
  - Technical guidance for inspectorate staff **(CE-5)**
  - Compliance guidance for air operators and service providers
- Training **(CE-4)** and deployment **(CE-6, CE-7, CE-8)**

Establishing EDTO Regulations
State Considerations

- The ICAO EDTO provisions can not simply be ‘copied and pasted’ into State regulations
  - Critical time values need to be established (EDTO Threshold Time, Maximum Diversion Time)
  - Applicability to State aviation environment should be evaluated
  - Differences, where appropriate, should be indentified

- The Annex 6 Standards provide a basic framework but do not cover detailed implementation in all areas (e.g. Approval Process)
  - States should also refer to available ICAO guidance materials (e.g. Doc 10085)
  - Other State implementations (e.g. FAA, EASA) may be consulted
  - Not all of the necessary provisions are EDTO specific (e.g. RFFS)

EDTO Threshold Time
State Considerations

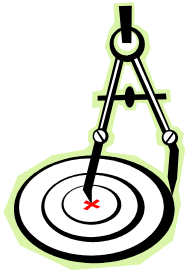


- EDTO threshold time values are **NOT** defined by ICAO and must be established by each Contracting State
  - Threshold times should be established for two engine aeroplanes and for aeroplanes with more than two engines
  - Generally not intended to be area, operator or aeroplane type specific
  - ICAO SARPS allow flexibility to accommodate variations for unique situations

- Considerations for alignment with other State Implementations
  - Many States have established a 60 minute threshold for two engine aeroplanes
  - EDTO Type Design Approvals for twins are based on operations beyond 60 minutes
  - A higher threshold time (e.g. 120, 180 minutes..) is typically appropriate for aeroplanes with more than two engines (Annex 6, Section 4.7.1 requirements still applicable)

EDTOM ***See Sections 1.1 and 3.1 for additional guidance on establishing EDTO Threshold Times***

Maximum Diversion Time (MDT)
State Considerations



- EDTO maximum diversion time values are **NOT** defined by ICAO and must be established by each Contracting State
  - State regulations should provide for EDTO maximum diversion time capabilities to support existing and future operational needs
    - EDTO up to 180 Minutes (specific MDT levels, regional considerations, flight by flight exceptions…?)
    - EDTO beyond 180 Minutes (additional airworthiness and operational considerations)
- Criteria for operational approval should be established for each MDT level
  - Aeroplane capability / time limited systems
  - EDTO program compliance elements (flight operations, maintenance)
  - EDTO approval methodology (accelerated, service experience)

EDTOM ***See Section 3.4 for additional guidance on establishing EDTO Maximum Diversion Times***

Module 8 - Outline

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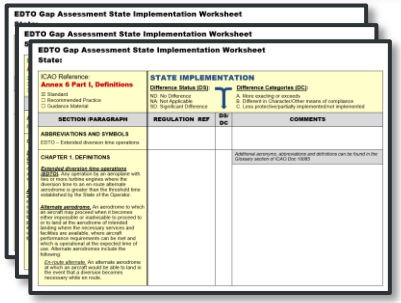
EDTO Gap Assessment Worksheet
Purpose and Use*



- An optional, structured tool to assist States with:
  - Implementing new EDTO regulations and guidance
  - Assessing compliance status of current State EDTO regulations
  - Identifying differences from ICAO EDTO Standards
- Includes all areas of ICAO EDTO Standards, Recommended Practices and Guidance Materials
  - Annex language repeated verbatim for comparison to State regulations
  - Guidance documents (9760, 9976, 10085) referenced by section/subject area
- Organized for easy transposition to ICAO USOAP CMA portal Electronic Filing of Differences (EFOD)

** Worksheet may also be adapted for use as an operator compliance checklist*

EDTO Gap Assessment Worksheet
Format and Content

EDTO Gap Assessment State Implementation Worksheet

State:

ANNEX 6

ICAO Reference: **Annex 6 Part I, Definitions** ☒ Standard ☐ Recommended Practice ☐ Guidance Material	**STATE IMPLEMENTATION** Difference Status (DS): ND: No Difference NA: Not Applicable SD: Significant Difference — Difference Categories (DC): A. More exacting or exceeds B. Different in Character/Other means of compliance C. Less protective/partially implemented/not implemented			
SECTION /PARAGRAPH	**REGULATION REF**	**DS**	**DC**	**REMARKS**
ABBREVIATIONS AND SYMBOLS EDTO – Extended diversion time operations				State Differences (if any)
CHAPTER 1. DEFINITIONS ***Extended diversion time operations (EDTO).*** Any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the State of the Operator.				*Additional acronyms, abbreviations and definitions can be found in the Glossary section of ICAO Doc 10085* State Regulation Reference
Alternate aerodrome. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following: *En-route alternate.* An alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while en route.	ICAO Reference			Guidance / State Remarks

EDTO Gap Assessment Worksheet
Format and Content (Cont'd)

EDTO Gap Assessment State Implementation Worksheet
State:

DOC 10085

ICAO Reference: **DOC 10085 (EDTOM)** ☐ Standard ☐ Recommended Practice ☒ Guidance Material	**STATE IMPLEMENTATION of EDTO Guidance**	
SECTION /PARAGRAPH	**REGULATION REF**	**REMARKS**
Extended Diversion Time Operations (EDTO) Manual Glossary Chapter 1. Policy and general information Chapter 2. Aircraft airworthiness considerations for EDTO Chapter 3. EDTO flight operations requirements Chapter 4. EDTO maintenance and reliability requirements		*Document 10085 deals exclusively with extended diversion time operations, and so the entire document may be used as guidance to Contracting States in implementing their own EDTO requirements. The chapter breakdown is listed for reference, however the document should be consulted for the details around each subject area.*

State Regulation Reference

ICAO Reference

Guidance / State Remarks

EDTO Gap Assessment Worksheet
Format and Content (Cont'd)

EDTO Gap Assessment State Implementation Worksheet
State:

DOC 9976

ICAO Reference: **DOC 9976 (FPFMM)** ☐ Standard ☐ Recommended Practice ☒ Guidance Material	**STATE IMPLEMENTATION of EDTO Guidance**	
SECTION /PARAGRAPH	**REGULATION REF**	**REMARKS**
CHAPTER 4 - UNDERSTANDING PRESCRIPTIVE COMPLIANCE		
4.4 Prescriptive alternate aerodrome selection and fuel planning provisions of Annex 6, Part I 4.4.1(b), 4.4.1(g)		
4.6 Take-off alternate aerodromes – distance from aerodrome of departure 4.6.1, 4.6.2, 4.6.3		
4.7 Takeoff alternate aerodromes – operating minima at estimated time of use 4.7.2		
4.8 En-route alternate aerodrome selection and specification 4.8.2, 4.8.3, 4.8.4, 4.8.7, 4.8.8(c), 4.8.8(d), 4.8.8(f)		

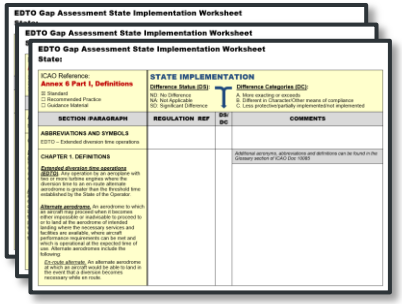
EDTO Gap Assessment Worksheet
Format and Content (Cont'd)

EDTO Gap Assessment State Implementation Worksheet
State:

DOC 9760

ICAO Reference: **DOC 9760, Part IV – Airworthiness Manual** ☐ Standard ☐ Recommended Practice ☒ Guidance Material	**STATE IMPLEMENTATION of EDTO Guidance**	
SECTION /PARAGRAPH	**REGULATION REF**	**REMARKS**
Chapter 5. Airworthiness Requirements for Extended Diversion Time Operations		
5.1 General		
5.2 Airworthiness considerations for aeroplanes with more than two turbine engines		
5.3 Airworthiness considerations for aeroplanes with two turbine engines		
5.4 Continuing surveillance		
5.5 Maintenance requirements		
5.6 Requirements for systems performance and reliability assessment		*This section applies to States of Design*

EDTO Gap Assessment Worksheet
Instructions



- Review content of referenced ICAO EDTO Standards, Recommended Practices and Guidance
- Identify/establish supporting State regulations and advisory materials
- Populate Gap Assessment Worksheet
  - State Identification
  - State regulation/guidance references for each item
  - Differences Status (DS) and Differences Categories (DC) as applicable
  - Remarks relative to State implementation and any differences to be filed

EDTO Gap Assessment Worksheet

Example Completion (Red Font)

EDTO Gap Assessment State Implementation Worksheet

State: ANTARCTICA

ICAO Reference: **Annex 6 Part I, Definitions** ☒ Standard ☐ Recommended Practice ☐ Guidance Material	**STATE IMPLEMENTATION** **Difference Status (DS):** ND: No Difference NA: Not Applicable SD: Significant Difference **Difference Categories (DC):** A. More exacting or exceeds B. Different in Character/Other means of compliance C. Less protective/partially implemented/not implemented			
SECTION /PARAGRAPH	**REGULATION REF**	**DS**	**DC**	**REMARKS**
ABBREVIATIONS AND SYMBOLS EDTO – Extended diversion time operations	**ACAR 1.1, Definitions**	**ND**		**Antarctica has elected to adopt the acronym 'EDTO' to replace 'ETOPS'**
CHAPTER 1. DEFINITIONS	**ACAR 121.161, Aeroplane Limitations: Type of Route**	**ND**		*Additional acronyms, abbreviations and definitions can be found in the Glossary section of ICAO Doc 10085* **State established threshold times: 60 minutes for aeroplanes with two engines and 120 minutes for aeroplanes with more than two engines**
Extended diversion time operations (EDTO). Any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the State of the Operator.				
Alternate aerodrome. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following: *En-route alternate.* An alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while enroute.	**ACAR 121.624, EDTO Alternate Aerodromes**	**SD**	**A**	**State regulation adds condition that domestic EDTO alternate aerodromes must be located on the permanent ice sheet unless seasonal variations are taken into account**

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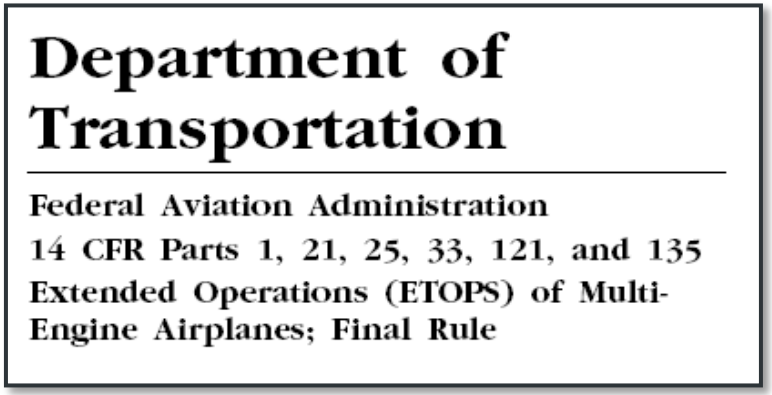
Examples of State Implementations

U.S. Federal Aviation Administration (FAA)

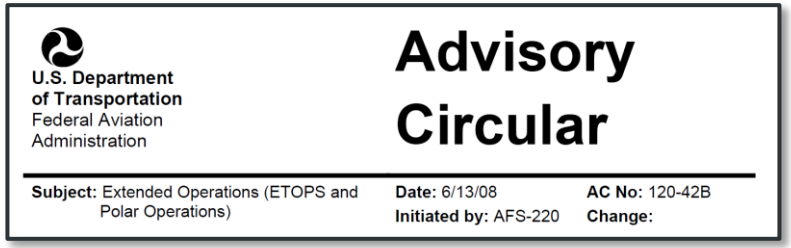


Department of Transportation

Federal Aviation Administration

14 CFR Parts 1, 21, 25, 33, 121, and 135

Extended Operations (ETOPS) of Multi-Engine Airplanes; Final Rule



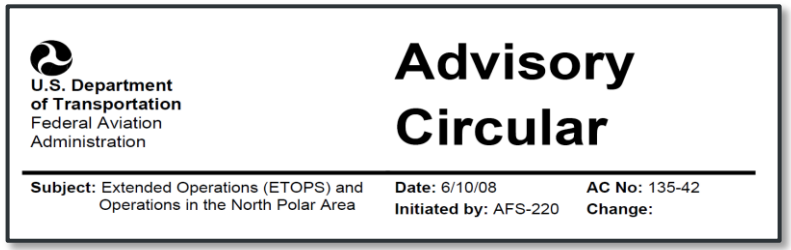
U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Extended Operations (ETOPS and Polar Operations)

Date: 6/13/08 **AC No:** 120-42B

Initiated by: AFS-220 **Change:**



U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Extended Operations (ETOPS) and Operations in the North Polar Area

Date: 6/10/08 **AC No:** 135-42

Initiated by: AFS-220 **Change:**

FAA ETOPS Regulations
Historical Perspective

- **Jun, 1985:** AC 120-42 (120/138 Minutes)
- **Dec, 1988:** AC 120-42A (180 Minutes)
- **Mar, 2000:** EPL 20-1 (207 Minutes for the 777)
- **Jun, 2000:** FAA ARAC Rulemaking Effort Launched
- **Jan, 2007:** **14 CFR Parts 25 and 121**
  (240 Minutes and beyond…)

Create → Refine → Extend





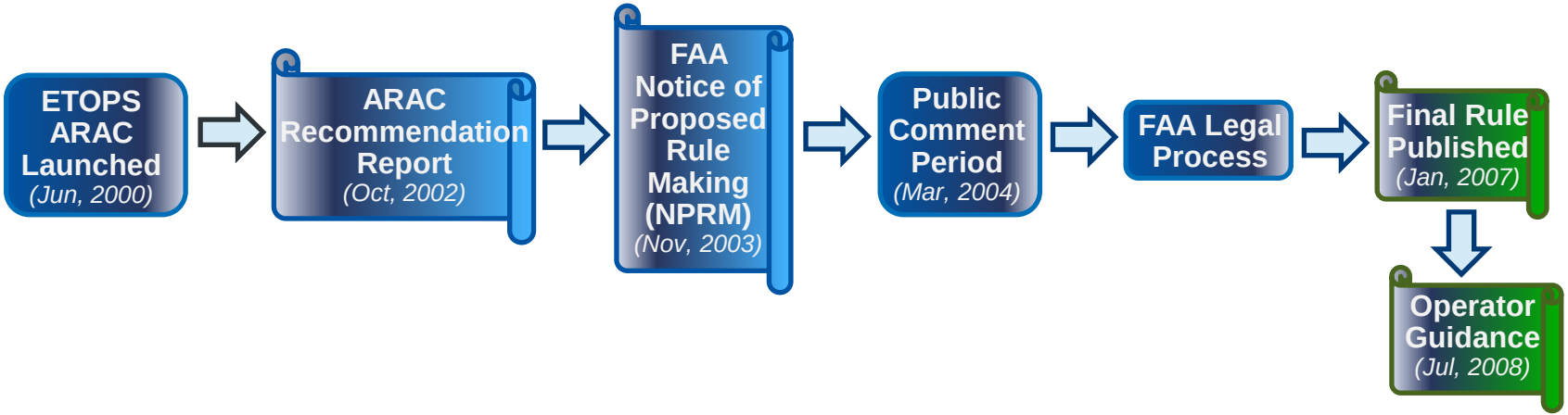
FAA ETOPS ARAC Tasking

ARAC: **Aviation Rule Making Advisory Committee** - A formal standing *advisory committee*… that provides FAA with information, advice and recommendations concerning rulemaking activity…

ARAC TASKING

- **Review** existing FAA ETOPS policy and requirements
  - Advisory Circular (AC) 120-42A, applicable ETOPS special conditions, policy memorandums and notices….
- **Develop** comprehensive ETOPS airworthiness standards for 14 CFR Parts 25, 33, 121, and 135
  - To codify the existing policies and practices
- **Develop** ETOPS requirements for operations in excess of 180 minutes up to whatever extent may be justified
- **Develop** standardized requirements for extended range operations for all airplanes, regardless of number of engines
- **Harmonize** such standardized requirements across national boundaries and regulatory bodies

FAA ETOPS ARAC Process



ARAC Working Group Participants:

- Airlines (U.S. and non-U.S.)
- Industry Organizations
- Airframe and Engine Manufacturers
- Pilot Associations
- Regulatory Agencies
- Other participants

FAA ETOPS Regulation Highlights

- Type design and operational requirements **codified** into regulation
  - 14 CFR Parts 25, 33, 121 and 135…
- New requirements for ETOPS beyond 180 minutes
- New requirements for passenger carrying airplanes with more than two engines
  - Cargo operations with more than two engines exempted from ETOPS
- '**ETOPS**' is retained but re-defined to mean '**Extended Operations**'
  - **60 minute** threshold for two engine airplanes
  - **180 minute** threshold for passenger airplanes with more than two engines

FAA ETOPS Regulation Summary
Type Design

PART 21 - Certification Procedures for Products and Parts

- Added § 21.4, ETOPS Reporting Requirements

PART 25 - Airworthiness Standards: Transport Category Airplanes

- Added § 25.3, § 25.1535 and Appendix K:
  - Requirements for two engine airplanes (K25.2) and airplanes with more than two engines manufactured after Feb 17, 2015 (K25.3)
  - Early ETOPS, Service Experience and Combined type design approval methods
  - Requirements for ‘up to’ and ‘beyond’ 180 minute ETOPS

PART 33 - Airworthiness Standards: Aircraft Engines

- Added engine specific requirements for ETOPS eligibility, including Design and Test Requirements for Early ETOPS (§ 33.201)
- AC 33.201-1, ‘Extended Operations (ETOPS) Eligibility for Turbine Engines’ provides supporting guidance

FAA ETOPS Regulations
Type Design Elements

FAR 25.1535

Appendix K

- **K25.1 Design Requirements**
  - Comply with Part 25 considering ETOPS
- **K25.2 Two-Engine Airplanes**
  - K25.2.1 Service Experience Method
  - K25.2.2 Early ETOPS
  - K25.2.3 Combined service experience & Early ETOPS Method
- **K25.3 Airplanes with more than two engines**
  - K25.3.1 Service Experience Method
  - K25.3.2 Early ETOPS
  - K25.3.3 Combined service experience & Early ETOPS Method

EARLY ETOPS

K25.2.2(a)	Relevant Experience *
K25.2.2(b)	Propulsion Design
K25.2.2(c)	Maintenance and Operations Validation *
K25.2.2(d)	Propulsion 3000 Cycle Ground Test
K25.2.2(e)	New Technology Testing *
K25.2.2(f)	APU 3000 Cycle Ground Test *
K25.2.2(g)	Airplane Demonstration Flight Test *
K25.2.2(h)	Problem Tracking and Resolution *
K25.2.2(i)	Acceptance Criteria (Type and Frequency of Problems)

* Also applicable to K25.3.2

FAA ETOPS Regulation Summary
Operations

PART 121 - Operating Requirements: Domestic, Flag and Supplemental

- Added various paragraphs to codify ETOPS Flight Operations and Maintenance requirements and new Appendix P to define diversion time specific considerations:
  - Two engine airplanes (P121, Section I): 75 Minutes, 90 Minutes, 120 Minutes, 138 Minutes, 180 Minutes, 207 Minutes, 240 Minutes and beyond 240 Minutes
  - Airplanes with more than two engines (P121, Section II): Beyond 180 Minutes
- AC 120-42B, 'Extended Operations (ETOPS and Polar Operations)' provides supporting guidance
  - ETOPS operational approval process (Accelerated and In-service methods)

PART 135 - Operating Requirements: Commuter and On-Demand

- Appendix G and other paragraphs added to define requirements for passenger carrying airplanes above 180 minutes (ETOPS Threshold) up to a maximum of 240 minutes
- AC 135-42, 'Extended Operations (ETOPS) and Operations in the North Polar Area provides supporting guidance

FAA ETOPS Regulations
Operational Elements

14 CFR Part 121

Definitions	121.7
Passenger Protection and Recovery*	121.97 121.135 121.415
Communication facilities*	121.99 121.122
Rescue and fire fighting service*	121.106
Airplane limitations: Type of route	121.161
ETOPS type design approval basis	121.162
ETOPS maintenance program *(twins only):*	121.374
EDTO Alternate Airports	121.624 121.625 121.631
Engine Inoperative: Landing; reporting	121.565
Time limited systems*	121.631
En-route fuel supply	121.646
Dispatch/flight release	121.687 121.689

Appendix P

Section I: ETOPS Approval: Airplanes with Two engines*
- 75 Minutes (Carribean/Western Atlantic)
- 75 Minutes (Other Areas)
- 90 Minutes (Micronesia)
- 120 Minutes
- 138 Minutes
- 180 Minutes
- Greater than 180 Minutes
- 207 Minutes (North Pacific)
- 240 Minutes (North Polar, NOPAC)
- 240 Minutes (South of the Equator)
- Beyond 240 Minutes

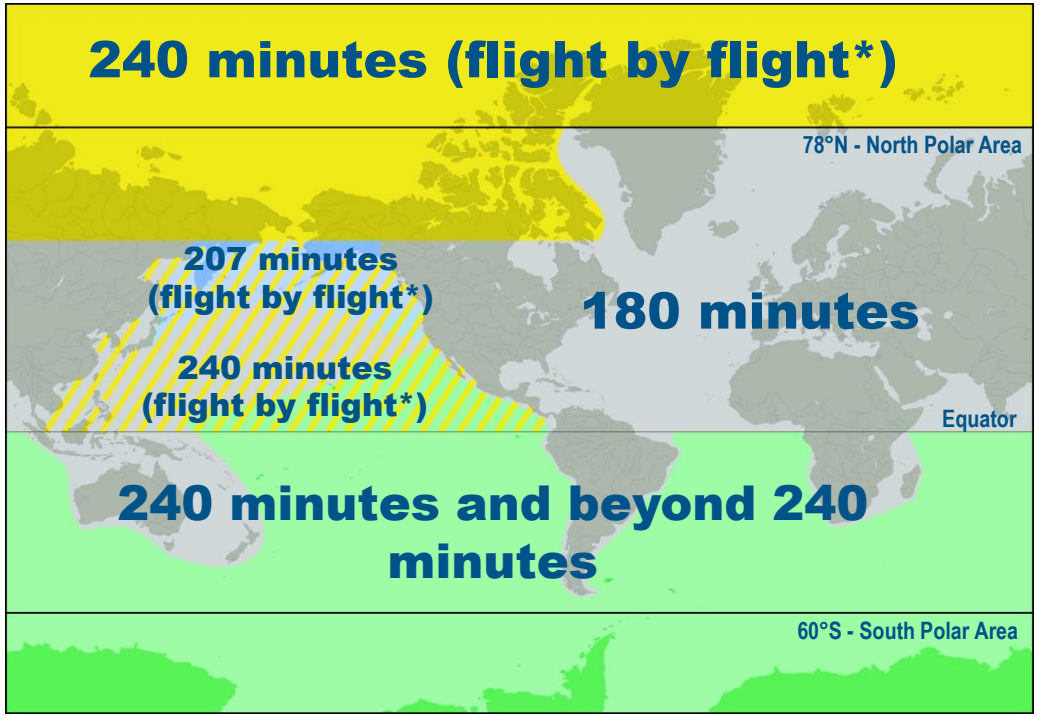
Section II: ETOPS Approval: Passenger airplanes with more than two engines*

Section III: Polar Operations Approval

*** Includes specific provisions for beyond 180 minute ETOPS**

FAA ETOPS Applicability
Two Engine Airplanes

FAR Part 121, Appendix P - Section 1



Maximum Times Authorized For Specific Regions:

Up to 180 Minutes

207 Minutes (flight by flight)

- Pacific Ocean areas north of 40°N (NOPAC ATS routes and published tracks between Japan and North America)

240 Minutes (flight by flight)

- North polar area
- Pacific Ocean north of equator

240 Minutes & Beyond 240 Minutes

- Pacific Ocean area between the US west coast and Australia, New Zealand, and Polynesia
- South Atlantic oceanic area and Indian Ocean area
- Oceanic area between Australia and South America
- South polar area

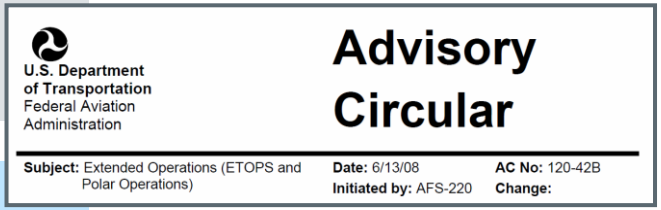
* **Flight by flight exception basis**: The use of a greater ETOPS maximum diversion authority under specific, limited circumstances…. (AC 120-42B)

FAA ETOPS Operational Guidance

AC 120-42B*

Chapter 1:	General
Chapter 2:	Background on ETOPS
Chapter 3:	Requirements for ETOPS Authorization
	- ETOPS Maintenance Requirements *(Two Engine Airplanes)*
	- ETOPS Flight Operations Requirements
Chapter 4:	Applications to Conduct ETOPS
Chapter 5:	FAA ETOPS Approval
Chapter 6:	Polar Operations

Appendix 1:	Definitions
Appendix 2:	EDTO Approvals
Appendix 3:	EDTO Approval Methods
	- Service Experience Method *(Two Engine Airplanes)*
	- Accelerated Method


U.S. Department of Transportation
Federal Aviation Administration

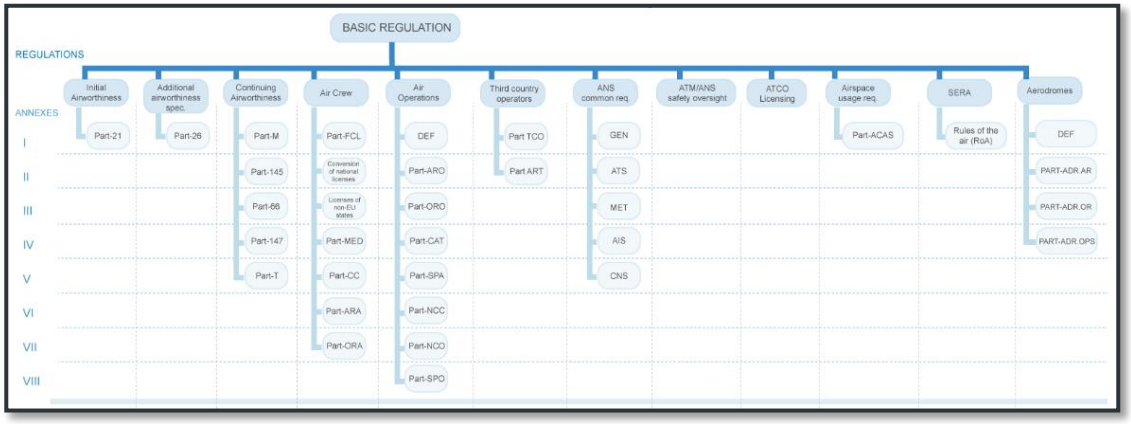
Advisory Circular

Subject: Extended Operations (ETOPS and Polar Operations) **Date:** 6/13/08 **AC No:** 120-42B
Initiated by: AFS-220 **Change:**

*** AC 120-42C update is currently under development**

Examples of State Implementations

European Aviation Safety Agency (EASA)*



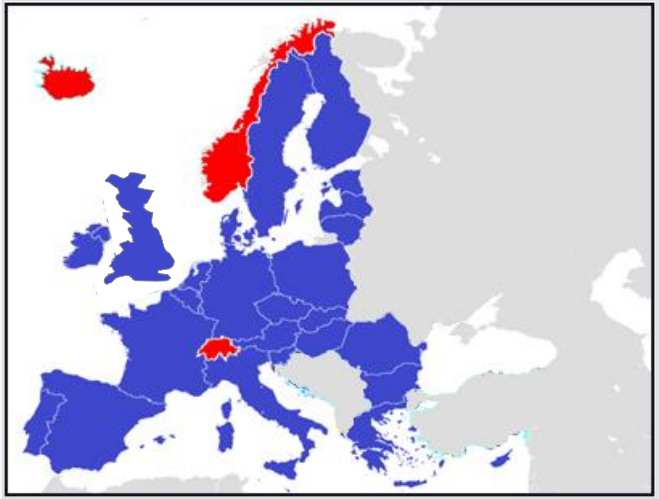
* **As implemented by EASA Member States**

European Aviation Safety Agency (EASA)

European Aviation Safety Agency
EASA

- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Italy
- Ireland
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- United Kingdom

- Iceland
- Liechtenstein
- Norway
- Switzerland



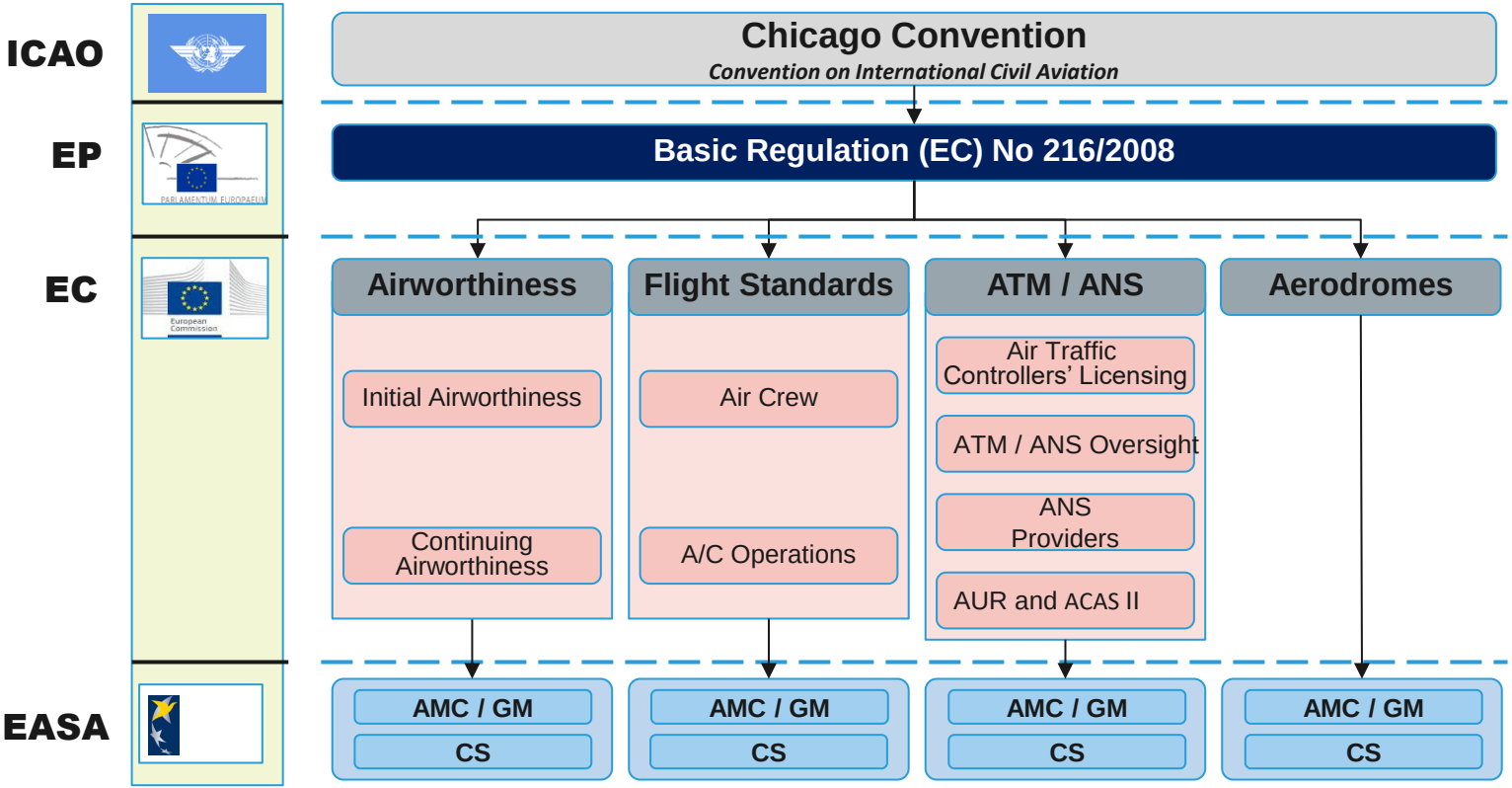
Blue: EASA Member and EU Member

Red: EASA Member but not EU Member

European Aviation Safety Agency (Continued)

- Formally established in September, 2002
  - Basic EU Regulation
- Agency active since September 28, 2003
  - Headquarters: Cologne (Germany)
- EASA has gradually superseded JAA and a proportion of activities and responsibilities of European National Aviation Authorities (NAAs)
  - Uniform rules and implementation in all EU Member States

European Union Aviation Rules
Ownership & Decision Levels



European Union Aviation Rules
Ownership & Decision Levels (Cont'd)

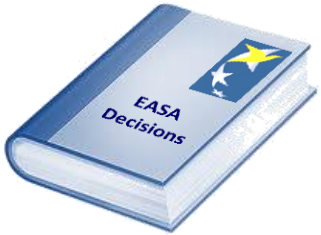
PARLAMENTUM EUROPAEUM

Council Regulations
Binding by law

European Commission

Commission Regulations
Binding by law

European Safety Aviation Agency

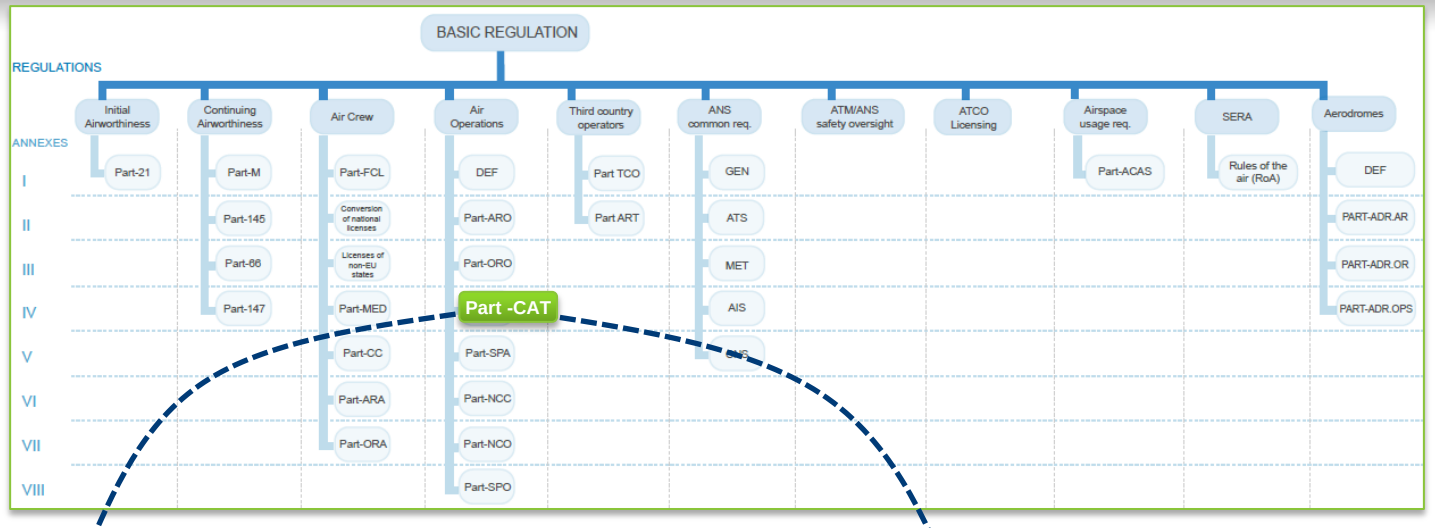


EASA Decisions
Standard means to show compliance with EC Regulations

Role Sharing
EASA vs EU Member State NAAs

	ACTIVITY	RULEMAKING	ISSUANCE OF APPROVALS & SUPERVISION
	Aircraft Design	EASA	EASA
	Production	EASA	NAA (EASA for Airbus POA)
	Maintenance	EASA	NAA (EASA for Airbus MOA)
	Operations & Licensing	EASA	NAA
	ATC & Airports	EASA	NAA

ETOPS Provisions in EASA Regulations (1 of 3)



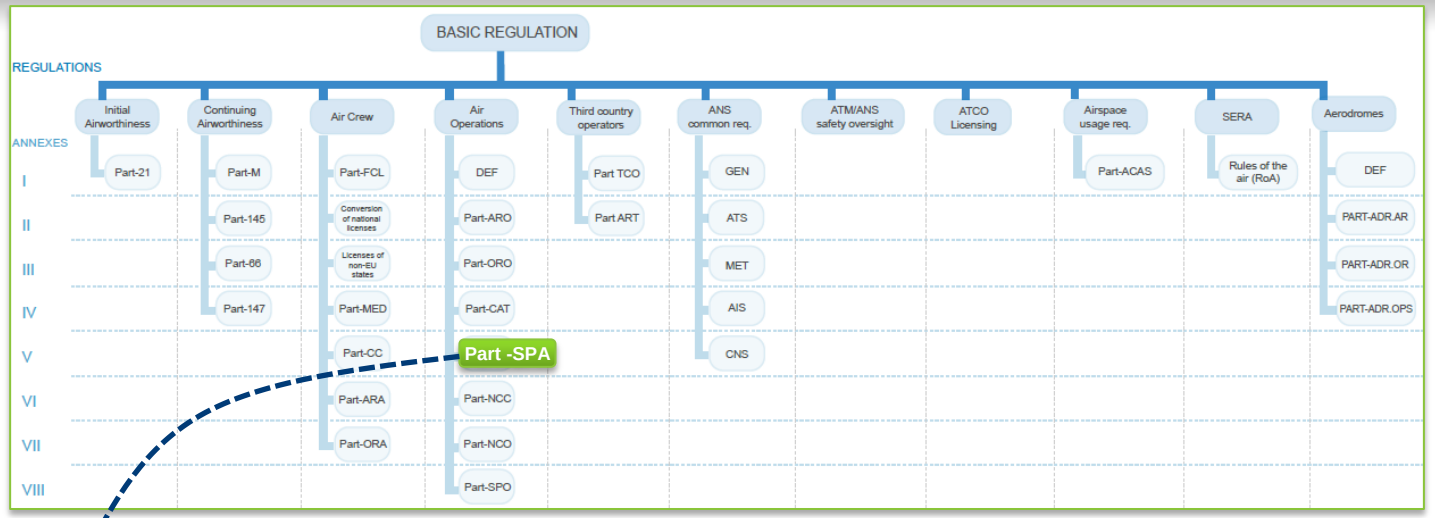
CAT.OP.MPA.140 Maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval

- Applicable to twins only
- Sets the maximum distance for non-ETOPS ops
- Defines OEI speed
- Refers to Annex V (Part-SPA), Subpart F, for ETOPS operational approval

CAT.OP.MPA.180 Selection of aerodromes — aeroplanes

- Selection of take-off alternates for ETOPS aeroplanes

ETOPS Provisions in EASA Regulations (2 of 3)

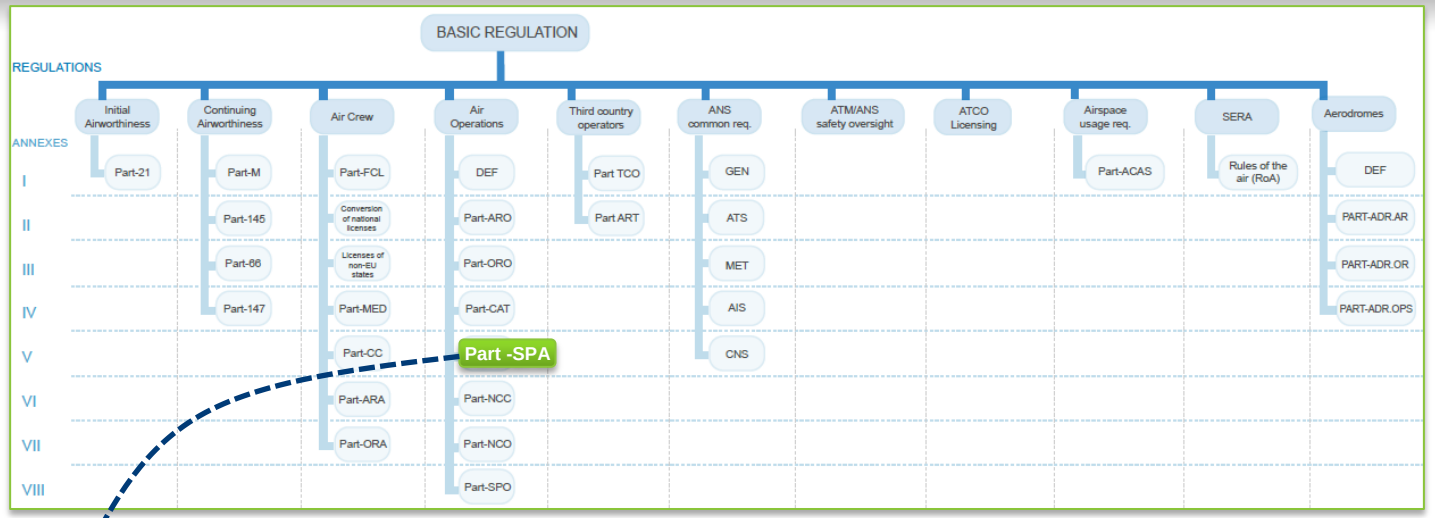


SUBPART F

EXTENDED RANGE OPERATIONS WITH TWO-ENGINED AEROPLANES (ETOPS)

- SPA.ETOPS.100 ETOPS : sets requirement for EDTO operational approval
- SPA.ETOPS.105 ETOPS operational approval : defines main criteria for EDTO operational approval
- SPA.ETOPS.110 ETOPS en-route alternate aerodrome : sets criteria for designated EDTO ERA
- SPA.ETOPS.115 ETOPS en-route alternate aerodrome planning minima : sets planning minima for EDTO

ETOPS Provisions in EASA Regulations (3 of 3)



Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Part-SPA

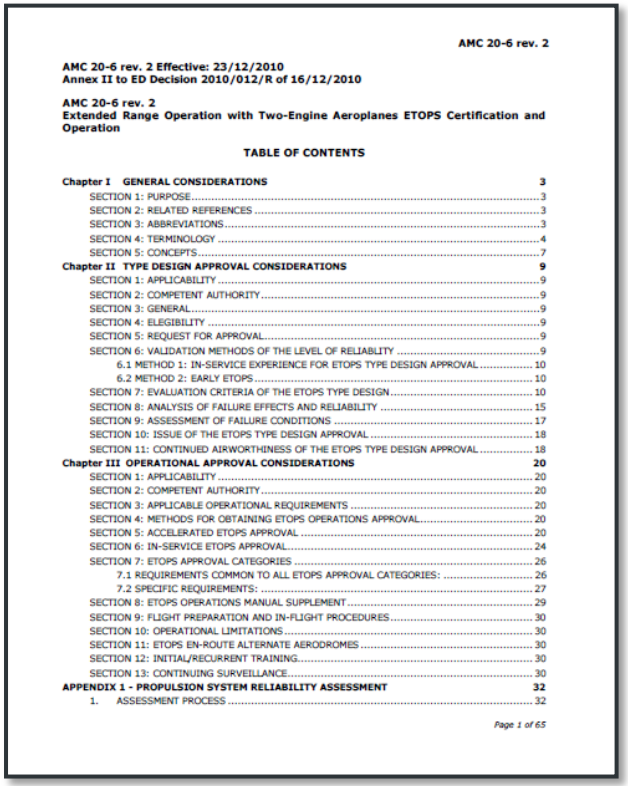
GM1 SPA.ETOPS.105 ETOPS operational approval

AMC 20-6

AMC 20-6 provides further criteria for the operational approval of ETOPS.

- GM1 SPA.ETOPS.105 : refers to AMC 20-6 for means of compliance for ETOPS approval

EASA AMC 20-6, Rev 2 (1 of 4)



AMC 20-6 rev. 2

AMC 20-6 rev. 2 Effective: 23/12/2010
Annex II to ED Decision 2010/012/R of 16/12/2010

AMC 20-6 rev. 2
Extended Range Operation with Two-Engine Aeroplanes ETOPS Certification and Operation

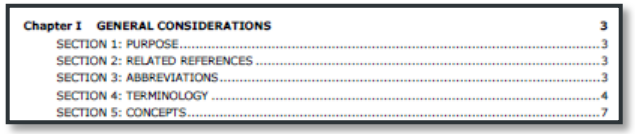
TABLE OF CONTENTS

Page 1 of 65

- AMC 20-6 was initially published in Nov. 2003
  - Content was based on previous JAA IL20 from 1995, similar to that of AC 120-42A
  - Revision of AMC 20-6 was initiated in 2006, further to FAA ETOPS ARAC WG activities
- AMC 20-6 revision 2 was issued in December 2010
  - Main changes are the incorporation of criteria for ETOPS>180 min
  - **AMC 20-6 Rev 2 applies to twins only**
- Layout of AMC 20-6 is improved in order to better separate the requirements for Type Design Approval (Chapter II) and Operational approval (Chapter III)
  - Criteria common to both approval processes are gathered in Chapter I

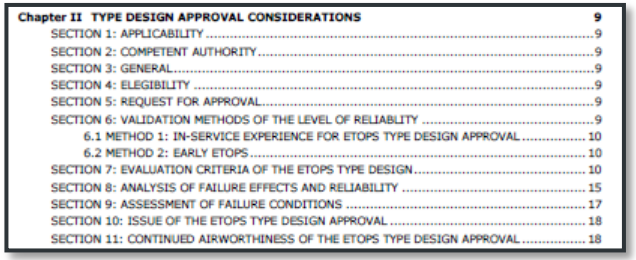
EASA AMC 20-6, Rev 2 (2 of 4)

Chapter I, General Considerations



- Introduces main concepts and provides definitions

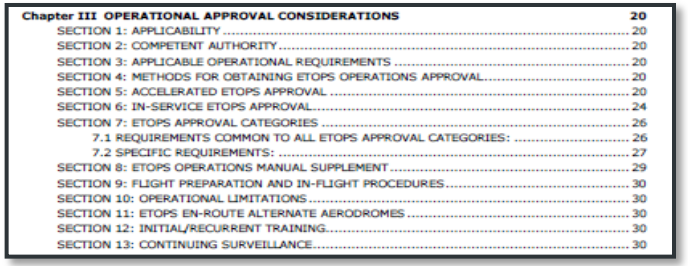
Chapter II, Type Design Approval Considerations



- Criteria for ETOPS certification of the aeroplane
- Section 6 defines the methods of approvals (“in-service” or “Early ETOPS”)
- Appendix 1 and 2 provides further guidance for reliability assessment of engine and aircraft systems

EASA AMC 20-6, Rev 2 (3 of 4)

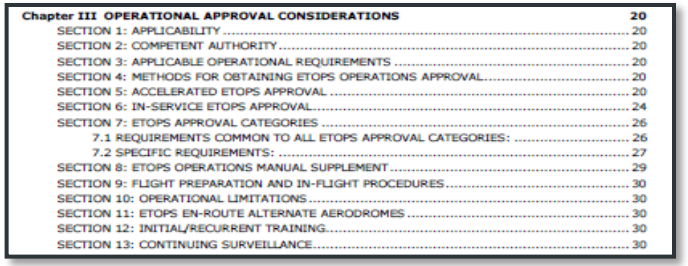
Chapter III, Operational Approval Considerations



- Criteria for ETOPS operational approval of the airline
- Section 4 defines the methods for obtaining ETOPS Operations Approval
  - Section 5 details the “Accelerated ETOPS Approval” and Section 6 the “In-Service ETOPS Approval”
- Section 7 lists the ETOPS Approval Categories and their associated criteria:
  - Section 7.1: Common Requirements *(all approval categories)*
  - Section 7.2.1: 90 Minutes or Less Diversion Time
  - Section 7.2.2: Above 90 Minutes up to 180 Minutes *(including provisions for a 15% operational extension)*
  - Section 7.2.3: Above 180 Minutes

EASA AMC 20-6, Rev 2 (4 of 4)

Chapter III, Operational Approval Considerations (cont'd)



- Appendix 3 to 8 provides further guidance related to ETOPS Operational approval:
  - Appendix 3: Operational Limitations *(area of operations, approved diversion time)*
  - Appendix 4: Flight preparation and In-flight procedures *(fuel supply, communication, …)*
  - Appendix 5: En-route alternate aerodromes *(selection, dispatch minima)*
  - Appendix 6: ETOPS Training program
  - Appendix 7: Typical ETOPS Operations Manual supplement
  - Appendix 8: Continuing Airworthiness *(maintenance program, service check, reliability program, …)*

Module 8 - Outline

Part I — Summary of ICAO EDTO SARPS and Guidance

Part II — Responsibilities of Contracting States

Part III— Considerations for Establishing EDTO Regulations

Part IV— EDTO Gap Assessment Worksheet

Part V — Examples of State Implementations

Part VI— Practical Exercise

Questions?

EDTO Workshop

End of Module 8 - Implementing EDTO Regulations