EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL

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(EAM/ICAO)

EAM 4 / ICAO

CONSISTENCY BETWEEN ESARR 4 and ICAO STANDARDS AND RECOMMENDED PRACTICES

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Abstract :

This document identifies consistencies and differences between the requirements published in the EUROCONTROL safety regulatory requirements developed in ESARR 4 and those published in ICAO SARPs.

The main objective is to demonstrate that the requirements and recommended practices for Risk Assessment and Mitigation published in Annex 11 Edition 13 were adequately covered within ESARR 4. A sub-purpose is to explain why, for certain requirements, it is necessary to expand on the ICAO SARPs.

Keywords :

ICAO Annex 11	ATS Safety Management	Consistencies
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F.3 DOCUMENT APPROVAL

The following table identifies all management authorities who have approved this document.

AUTHORITY	NAME AND SIGNATURE	DATE
Quality Control (SRU)	***signed by Daniel Hartin*** (Daniel HARTIN)	23-Jun-05
Head Safety Regulation Unit (SRU)	***signed by Peter Stastny*** (Peter STASTNY)	23-Jun-05
Chairman Safety Regulation Commission (SRC)	***signed by Ron Elder*** (Ron ELDER)	23-Jun-05

Note: For security reasons and to reduce the size of files placed on our website, this document does not contain signatures. However, all management authorities have signed the master copy of this document which is held by the SRU. Requests for copies of this document should be e-mailed to: sru@eurocontrol.int.

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F.4 DOCUMENT CHANGE RECORD

The following table records the complete history of this document.

EDITION NUMBER	EDITION DATE	REASON FOR CHANGE	PAGES AFFECTED
0.01	24-Oct-02	Creation of document from SRC Document 19, edition 0.04, dated 31-Aug-2002.	All
0.1	05-Feb-03	Document status amended to 'Draft Issue' following RTF consultation. Document sent to SRC for comment.	All
0.2	11-Mar-03	Incorporating comments from SRC Comment distribution under RFC 0302. Document sent to SRC Commissioners, Advisers and Observers for approval by correspondence.	All changes are highlighted
0.3	22-Apr-03	Incorporating comments from SRC Comment distribution under RFC 0319.	All Changes are highlighted
1.0	28-Apr-03	Document approved for formal released following RFC 0319.	All
1.01	13-Sep-04	Review of ESARR 4 requirements against ICAO SARPs.	All
1.02	15-Oct-04	Rationalisation of document.	All
1.03	17-Dec-04	Additional comments from SRU incorporated.	7, 8
1.04	24-Feb-05	SRU quality check. Document sent to RTF for formal consultation.	All
1.1	04-May-05	Document sent to SRC for formal consultation and approval.	All
2.0	23-Jun-05	Document released following formal SRC consultation and approval (RFC No. 0510).	-

F.5 CONTENTS

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F.6 EXECUTIVE SUMMARY

The Safety Regulation Commission's (SRC) initial work on the harmonisation of safety regulatory requirements identified and focussed on those safety areas which, in its view, needed most urgent attention. The resulting SRC Work Programme recognised the need to establish a number of EUROCONTROL Safety Regulatory Requirements, one of which was ESARR 4 "Risk Assessment and Mitigation in ATM".

Amendment 40 to ICAO Annex 11, Edition 13, Air Traffic Services, became applicable in November 2001 and included provisions relating to the introduction of ATS Safety Management. Annex 11 is the only identified ICAO SARP that relates to ESSAR 4.

Although Annex 11 includes basic Safety Management requirements and recommended practices, the increase in traffic within the ECAC region, together with new technology and a more mature Safety Management experience, has enabled more detailed ATM Safety Assessment procedures to be mandated.

ESARR 4 provides for a European-wide solution to the implementation of Safety Assessment related amendments to Annex 11. These principles and requirements allow for a harmonised implementation of related provisions of Annex 11 in ECAC.

This document identifies consistencies and differences between the respective Safety Assessment provisions contained in ICAO Annex 11 (sections 2.26)[1] and currently approved ESARR 4.

It should be noted that this document does not provide mapping of ICAO requirements below the level of the SARP material. It does not, therefore, include material such as PANS ATM Doc. 4444.

Extensive consistency with ICAO SARPs is shown to exist and unless the specifics of the national implementation of ESARR 4 justifies otherwise, there is no need for States to file a difference.

Where it has been necessary for ESARR 4 to expand further upon them or to address areas not currently covered in ICAO Annex 11, the document presents the rationale in a form which may assist States in addressing these documents at the national level.

This Advisory Material is only valid if a State has enacted ESARR 4 within its own legislation without detriment to the provisions of ESARR 4 or its meaning.

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[1] *Annex 11 13th Edition (including amendment 42).*

1. INTRODUCTION

The SRC's initial work on the harmonisation of safety regulatory requirements identified and focussed on those safety areas which, in its view, needed most urgent attention. Thus, the SRC Work Programme involved the preparation of a number of Policies and EUROCONTROL Safety Regulatory Requirements (ESARRs), including ESARR 4, Risk Assessment and Mitigation in ATM, when contemplating changes to the ATM System.

This document identifies consistencies and differences between the respective safety management provisions of ICAO Annex 11[2] and the currently approved ESARR 4. Annex 11 is presently the only ICAO SARP that includes material[3] related to ESARR 4; therefore, this EAM4 / ICAO document relates to all relevant provisions in ICAO SARPs.

This document is part of a series. There is a document for each ESARR showing the corresponding provisions of ICAO SARPs (EAM X / ICAO, where X is the number of the appropriate ESARR). There is similarly one document that shows the correspondence between each ICAO Annex and the corresponding ESARR provisions.

2. PURPOSE OF DOCUMENT

The main purpose of this document is to demonstrate that the requirements and recommended practices for safety management published in Annex 11 Edition 13 are adequately covered within ESARR 4.

A secondary objective of this document is to explain why, for certain requirements, it was necessary for ESARR 4 to expand further upon ICAO SARPs or to address areas not currently covered in ICAO Annex 11.

This document can also be used to assist ECAC States in justifying why they do not need to file differences between their national regulations dealing with risk assessment and mitigation in ATM (and associated practices) and the Standards laid down in ICAO Annex 11.

It is however recognised that the notification of differences is a State's responsibility and that this document only provides harmonised guidance to States.

This document can also be used when States are being audited by ICAO in the framework of the expanded ICAO Universal Safety Oversight Audit Programme (USOAP).

This Advisory Material is only valid if a State has enacted ESARR 4 within its own legislation without detriment to the provisions of ESARR 4 or its meaning.

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[2] *Annex 11 13th Edition (including amendment 42).*

[3] *Annex 14 includes provisions requiring the implementation of safety management systems. However, its scope is confined to aerodrome operations and does not include the provision of ATM services.*

3. SUMMARY OF COMPARISON –ANNEX 11 WITH ESARR 4

The provisions of ESARR 4 must be compared with the related ICAO requirements, which are the minimum standard to be applied, to ensure that they are consistent.

The scope of ESARR 4 is wider than Annex 11 in that includes ATM whereas Annex 11 is limited to the provision of Air Traffic Services (or even only ATC in some cases).

A careful review of ICAO Annex 11 has identified a number of points where ESARR 4 provides expansion in terms of scope and detail of requirements as well as clarification. In particular:

- The scope of Annex 11 section 2.26 is restricted to the provision of ATS within airspaces and at aerodromes while ESARR 4 requires, more explicitly, a total ATM (including ASM and ATFM) system approach and with the safety levels in the airspace in its entirety;

- Annex 11 addresses the safety level without any restriction on the type of aircraft the services are provided to. ESARR 4 applies to all providers of ATM services, in respect of those parts of the ATM System and supporting services within their managerial control, and also applies to military ATM service providers except where military ATS or Air Defence are exclusively involved in the control of military aircraft in a segregated military airspace environment. Although the present TLS only applies to airspace and aerodromes in ECAC where Commercial Air Transport flights are operated, it is recommended to derive national ATM safety minima for General Aviation;

- Annex 11 only requires four minimum generic elements of ATS safety assessment without providing further explanation of what ATS safety assessment really demands. On the other hand, ESARR 4 provides a comprehensive set of requirements;

- Annex 11, section 2.26.5 only addresses “significant safety-related changes to the ATC system” (‘*significant’ not being determined*);

- ESARR 4 requires that all changes to the ATM System be assessed for their safety impact. The safety significance of those changes must be assessed during that process. The reason for the assessment and grading of safety significance has implications on the rigour of the mitigation process;

- Annex 11 is scoped to the provision of international services and could be interpreted as not applicable to airports with purely domestic traffic. On the basis of present differences filed to ICAO, this interpretation is not used in ECAC and in ESARR 4 the requirements are focussed on all providers of ATM regulated by the National regulators. Thus it is unlikely within the practical implementation of ESARR 4 that any class of civil aviation users will be omitted from this scope.

4. ASSESSMENT OF RATIONALE FOR ESARR 4

Annex 11 provides a common safety assurance methodology based on a Safety Management System (SMS) that allows a consistent regulatory approach and, consequently, a common framework for USOAP assessment and comparison. The SMS should also ensure a safety target is defined (quantitative or qualitative), that hazards are identified, remedial action planned (and taken) and that monitoring ensures that the safety level is maintained. Through this process aims to ensure that proposed changes to the ATS System will not jeopardise safety.

ESARR 4, however, stemmed from the need identified by the SRC to more formally and systematically assess and control the safety impact of changes to the ATM System. Within the overall objective of ensuring safety, the objective of this requirement is to ensure that the risks associated with hazards in the ATM System are systematically and formally identified, assessed, and managed within safety levels which, as a minimum, meet those approved by the designated regulatory authority.

5. CONCLUSIONS

The requirements in Annex 11 that correspond to the scope of ESARR 4 are fully met by ESARR 4. Additionally, the implementation of ESARR 4 (along with ESARRs 3 and 6) by the EUROCONTROL Member States[4] is considered as a regional approach taken in ECAC to address the implementation of the ATS safety management programmes required in ICAO Annex 11, Section 2.26.

This document demonstrates that the implementation of ESARR 4 only enhances the provisions of Annex 11 without imposing any requirements on international civil aviation. Therefore, and unless the specifics of the national implementation of ESARR 4 justifies otherwise, States do not need to notify ICAO of a difference to Annex 11.

The whole set of ESARR 4 (along with ESARRs 3 and 6) provisions provides for a comprehensive set of measures, at a level of mandatory requirements, that fully covers all the aspects and issues included in Annex 11 section 2.26.

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[4] *In accordance to Decisions made by the EUROCONTROL Commission.*

APPENDIX A – DETAILED COMPARISON BEWTEEN ESARR 4 AND ICAO ANNEX 11

ESARR 4, Edition 1.0	ICAO Annex 11
ESARR 4 - 5.1 An ATM service provider shall ensure that hazard identification as well as risk assessment and mitigation are systematically conducted for any changes to those parts of the ATM System and supporting services within his managerial control, in a manner which: a. addresses ….; b. addresses the airborne and ground[5] components of the ATM System, through co-operation with responsible parties; and c. addresses…...	2.26.5 Any significant safety-related change to the ATC system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met …and users have been consulted.
ESARR 4- 5.2 The hazard identification, risk assessment and mitigation processes shall include:- a. a determination…; b. a determination…:- (i) environment of operations, and (ii) effect on aircraft c. the derivation of…; d. verification of…;	

[5] *Including spatial components.*

ESARR 4, Edition 1.0	ICAO Annex 11
*ESARR 4 - 5.*3 The results, associated rationales and evidence of the risk assessment and mitigation processes, including hazard identification, shall be collated and documented in a manner which ensures:- a. that correct and complete arguments are established to demonstrate that the constituent part under consideration, as well as the overall **ATM System are, and will remain, tolerably safe including, as appropriate, specifications of any predictive, monitoring or survey techniques being used**; *(Note: It is recognised that a combination of quantitative (e.g. mathematical model, statistical analysis) and qualitative (e.g. good working processes, professional judgement) arguments may be used to provide a level of assurance that all identified safety objectives and requirements have been met).*	2.26.5 When appropriate, the responsible authority shall ensure that adequate provision is made for post-implementation monitoring, to verify that the defined level of safety continues to be met. *Note 1.— When, due to the nature of the change, the acceptable level of safety cannot be expressed in quantitative terms, the safety assessment may rely on operational judgement.*
COMMENT: The scope of ESARR 4 (ATM) is wider than the strict definition of Annex 11. Therefore, the implementation of these two requirements enables full compliance with the provisions of the Annex 11. The main differences with Annex 11 relate to the fact that only safety significant changes are subject to the provisions of Annex 11 whereas all changes are subject to the provisions of ESARR 4. However, this may be considered to reflect the usual concerns that not all changes are assessed or proven to the same level of rigour or that non-safety related changes require a full assessment process. The Annex 11 requirement, therefore, reflects a safety significance filter. Such a filter is built into the ESARR 4 process with non-safety significant changes (those equivalent to SC5) with the expectation being that such non-safety related changes might have no associated safety requirements. ESARR 4 develops further the requirements included in Annex 11 by placing minimum requirements on the risk assessment and mitigation process, and by providing a quantitative framework to the assessment of proposed changes.	

ESARR 4, Edition 1.0	ICAO Annex 11
ESSAR 4 Appendix A-1 Severity classifications	No provisions
ESARR 4 Appendix A-2 Risk classification scheme Note: It is considered that ESARR 4 complies fully with this Annex 11 requirement as the application of the policy allows for the apportionment of the safety minima to the constituent parts of ATM. **The apportionment, however, remains to be done at national level.**	2.26.2 ….the acceptable level of safety and safety objectives applicable to the provision of ATS within airspace's and at aerodromes should be established by the State or States concerned. When applicable, safety levels and safety objectives should be established on the basis of regional air navigation agreement.

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