EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

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(EAM/GUI)

EAM 4 / GUI 4

A METHOD FOR STATES TO DETERMINE NATIONAL ATM SAFETY MINIMA

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This document is intended to provide ECAC States a methodology to derive their national ATM Safety Minima based on the method defined in SRC POL DOC1.		
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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)	05-Mar-04
Head Safety Regulation Unit (SRU)	***signed by Peter Stastny*** (Peter STASTNY)	05-Mar-04
Chairman Safety Regulation Commission (SRC)	***signed by Martin Radusch*** (Martin RADUSCH)	05-Mar-04

* In order to reduce the size of files, all documents placed on the SRC Website do not contain signatures. However, please note that all management authorities have signed the master copies held by the SRU. Requests for copies of master documents should be e-mailed to: sru@eurocontrol.int.

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	05-02-03	Document created from SRC DOC 15, Edition 0.8 and sent to RTF for comment.	All
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1.0	17-02-04	Document formally issued.	All

F.5 CONTENTS

F.6 EXECUTIVE SUMMARY

SRC POLICY DOC 1 represents the SRC position on the ECAC Safety minima to be applied to the ATM system. While its purpose was to derive the ECAC Safety Minima, it also represents an agreed process for determining safety minima in general.

This document proposes to use this agreed process as a possible method to determine ATM Safety Minima at the national level.

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1. INTRODUCTION

1.1 Purpose

The derivation of Safety Minima for ATM in the ECAC region and at national level is an essential starting point for safety decision making process.

This document develops one methodology States may use to derive National ATM Safety Minima. The methodology is based on the analysis provided within SRC POL DOC 1, ECAC Safety Minima for ATM, which partly develops the high-level safety objectives of the ATM Strategy for 2000+ into ECAC ATM Safety Minima.

As the method proposed depends on national accident data when available and traffic growth predictions, the method also proposes guidance on how to progress should this data not be available.

2. SCOPE

This document is not intended to benchmark states against other states, but aims to provide States with a possible method to develop National ATM Safety Minima.

This guidance material is not intended to be a mandatory method, or even a recommended or best practice method for deriving the National ATM Safety Minima.

As per the definition in the SRC Documentation Framework Document approved at SRC 12, Guidance Material is;

- *Intended to provide ATM safety regulators with guidance and additional information to support the implementation of a specific ESARR.*
- *Not mandatory. They only provide information, explanation or may indicate best practice.*
- *They provide additional information including guidance material for ATM Safety Regulators in order to support the implementation process from a regulatory perspective.*

This guidance does not prevent the use by states of other methods of deriving National ATM Safety Minima. Future methods may include the use of incident / occurrence data in order to address the determination of safety targets at national level for other Severity Classes, rather than focussing on severity class 1, for which data will always be limited.

3. NATIONAL ATM SAFETY MINIMA (TARGET LEVEL OF SAFETY – (TLS)

3.1 Determine National ATM Safety Minima

The basic steps are as follows:

- ***Step 1***

  Determine the annual rate of accidents[1,2] with Direct[3] ATM contribution based on historical data[4].

  Within SRC POLICY DOC 1 this took two steps, firstly the derivation of annual accident data, and then secondly a derivation of the percentage of accidents with direct ATM contribution. States could follow the mechanism in SRC POL DOC 1 by organising an expert group which will analyse the causes of accidents and determine the ATM direct contribution.

  The multiplication of these gave the annual rate of accidents with Direct ATM contribution.

- ***Step 2***

  Determine expected number of flight hours (or number of flights) in 2015 from present figures and expected rate of traffic growth for period to 2015.

- ***Step 3***

  Determine unadjusted National ATM Safety Minima for 2015. This is the annual rate of accidents with ATM direct contribution derived in step 1 divided by the number of flight hours (or number of flights) in 2015 derived in Step 2[5].

- ***Step 4***

  Compare unadjusted National ATM Safety minima for 2015 derived in step 3 with the ECAC ATM Safety minima derived from POLICY DOC 1 (1.55 x 10^{-8} per flight hour or 2.31 x 10^{-8} per flight).

  Where the unadjusted National ATM Safety Minima for 2015 derived from step 3 is numerically greater than the ECAC TLS, then this indicates that the expected performance of the National ATM system will be less safe than the ECAC Safety Minima requires. In such cases, the ECAC ATM Safety Minima shall be the Target National ATM Safety Minima used.

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[1] The present ESARR 4 only defines an ECAC Safety Minima for Commercial Air Transport flights involving Aircraft (excluding helicopters) with a Maximum Take-off Weight (MTOW) greater than 2,25 tonnes. ESARR 4 also recommends the definition of TLS in other areas of airspace, for example where exclusive General Aviation operations are carried out.

[2] For ATM, one accident can involve 2 or more aircraft. See A2 of ESARR 2.

[3] See A3-2 of ESARR 2 and associated definition in ESARR 2.

[4] SRC Policy Document 1 used the period 1988 to 1999.

[5] As the number of national accidents with direct ATM contribution are not allowed to increase (Equivalent to the safety objective from the ATM 2000+ Strategy for ECAC wide accidents).

Where the unadjusted National ATM Safety Minima for 2015 derived from step 3 is numerically smaller than the ECAC Safety Minima for 2015, i.e. expected to indicate the unadjusted National ATM Safety Minima is safer than the ECAC ATM Safety Minima for 2015, then the unadjusted National ATM Safety Minima for 2015 or the ECAC ATM Safety Minima for 2015 can be used for the Target National ATM Safety Minima for 2015.

- ***Step 5***

  Decide on National ATM Safety Minima for 2015.

  The Nation still has the option of using a National ATM Safety Minima for 2015, when designing the national ATM system, that is numerically smaller than the ECAC ATM Safety Minima for 2015[6],[7].

4. GUIDANCE FOR WHEN THE GENERAL METHOD FAILS

When the data review is carried out, it can be expected that some states will find that the data indicates one of the following conditions:

- no accidents (used in step 1) (see paragraph 4.1),
- some accidents, but none with an identified ATM direct contribution (used in step 1) (see paragraph 4.2),
- unknown national traffic growth (used in step 2) (see paragraph 4.3).

4.1 No Accidents Recorded in National Database

This is the case when states do not have any record for accidents. Therefore no data is available to start working on the safety minima. In this case:

- States can interrogate ICAO database (or others) and identify if records are available within that database that apply to their state.
- Should no records be available within ICAO database states could make use of the historical derived rate of $1.55 * 10^{-8}$ accident/flight hour (or 2.31×10^{-8} per flight) with ATM direct contribution used within the SRC POL DOC 1.

6 This allows National Authorities to set more stringent (Safer – numerically smaller) Safety Minima if desired.

7 Some countries also consider the obligation under the ECAC ATM 2000+ strategy to mean that the number of accidents in the country shall not increase. This would mean that these countries could not take the ECAC ATM Safety Minima if this is numerically larger than the National ATM Safety Minima.

4.2 No ATM Direct Contribution Identified from the Analysis of Accidents Recorded in the National Database

This is the case when no ATM direct contribution can be determined from the analysis of the causes of the accidents recorded in the period chosen for the analysis. This case has the following possible solutions:

- States could adopt the figure used within SRC POL DOC 1 for the ATM direct contribution: 2%. States could then form an expert group to decide if this value is appropriate for their environment of operations. or
- States could form an expert group to decide the percentage figure for ATM direct contribution appropriate for their environment of operations.

4.3 No Traffic Forecast is Available at National Level

This is the case when no forecast mechanism is available at national level and states can not assume which is the percentage which their traffic will increase or decrease. When such situation is encountered states could adopt the STATFOR[8] forecast plan. The STATFOR is (in 2003) proposing three scenarios which include:

- low scenario increase by 2,5% per annum,
- baseline scenario increase by 3,6% per annum,
- High level scenario increase by 4,7% per annum.

The high level scenario[9] could be given preference unless national situation can justify another choice.

5. REGULAR REVIEW OF NATIONAL ATM SAFETY MINIMA

It is considered that the initial data capture exercise to determine the National ATM Safety Minima will be open to a great deal of uncertainty depending on the quality of data available. The purpose of this step is to undertake a regular review of the National ATM Safety Minima to ensure that the latest data is used. The review is then necessary to determine if the National ATM Safety Minima remains consistent with ESARR 4 or indicates required changes to the Risk Tolerability scheme at national level.

**** End of Document ****

8 See www.eurocontrol.int/statfor for further information.

9 Or when appropriate, the individual regional forecasts in the STATFOR report.