GUIDANCE MATERIAL:

RISK CLASSIFICATION SCHEME

1   INTRODUCTION

This Guidance Material is further detailed into EUROCAE ED125 document that contains details on Risk Classification Scheme (RCS) definition, content (quantitative Safety Targets) and means to define National Regulatory RCS, ANSP RCS.

Note: ED125 proposes also means to quantify Safety Objectives, but ONLY for hazards at the scope of the Air Traffic Management Service Provision, based on the methods developed in FHA Chapter 3 Guidance Material G.

2   RISK CLASSIFICATION SCHEME DEFINITION

Risk Classification Scheme/Matrix specifies the maximum acceptable and tolerable frequencies of occurrence of an (hazard) <u>effect</u> of a certain severity class per reference unit (flight hour, operational hour, per sector, etc.) It is derived in accordance with the definition of risk.

Risk is defined as combination of the overall frequency of occurrence of a harmful effect induced by the hazard and the severity of that effect.

Acceptable risk	Acceptable risk defines the target risk for an ATMSP as defined in their Risk Classification Scheme (RCS). Acceptable risk is more demanding than tolerable risk.
Tolerable risk	Tolerable risk defines the target risk for a National Regulator as defined in their Risk Classification Scheme (RCS).

The Risk Classification Scheme referred to in this document only applies to introduction of new systems or changes to existing system (Design target) and are not intended to be used to assess the in-service safety performance.

The RCS consists of a table made of 5 Safety Targets (1 Safety Target per Severity Class). In the framework of ESARR4, 5 Safety Targets are set:

- ST1: Safety Target for Severity Class 1 effects (Accidents);

- ST2: Safety Target for Severity Class 2 effects (Serious Incidents);

- ST3: Safety Target for Severity Class 3 effects (Major Incidents);

- ST4: Safety Target for Severity Class 4 effects (Significant Incidents);

- ST5: Safety Target for Severity Class 5 effects (No immediate effect on safety).

A Safety Target specifies the overall maximum frequency of occurrence of effects having a given Severity Class. It does not specify the maximum frequency of occurrence of mid-air collision only. For example ST1 specifies the overall maximum frequency of accidents whatever the kind of accident (e.g. mid-air collision, Controlled Flight Into Terrain (CFIT), Aircraft collision on the ground, Collision between an aircraft and a vehicle, ….).

A RCS does not aim at apportioning the maximum risk between events of the same Severity (e.g. 50% for mid-air collision, 30% for CFIT, 20% collision on runway).

An ATMSP should define its own Risk Classification Scheme, consistent with the National one, which adequately reflects the operational environment in which the ATMP operates. It means that the ATMSP RCS should satisfy, as a minimum, the National Risk Classification Scheme and includes:

- the contribution of the ATMSP to overall national ATM risk and

- an ambition factor (or safety margin factor) which represents the ratio between regulatory minimum and what the ATMSP accepts to generate as a risk.

The National Risk Classification Scheme provided by the National Safety Regulatory Authority should specify at least the maximum tolerable frequencies of ATM contributing to accidents and incidents at the level of national airspace, but the National RCS can not be used <u>directly</u> (an apportionment has to be done) by the ATMSP for setting the Safety Objectives for individual hazards when dealing with specific constituent part of the ATM System.

Sometimes, the National Risk Classification Scheme can not be used <u>directly</u> by an ATMSP as many ATMSPs may contribute to this National ATMSPs. However, ATMSPs should provide the link between their RCS and the National RCS.

The National risk has to be apportioned down to the lower levels, such as functions or sub-systems. This could be done different ways: per phase of flight, per function of the ATM System, etc.

Safety Target (ST) = The maximum acceptable frequency of occurrence of an effect.

National Regulatory Risk Classification Scheme (RCS) has to be specified as follows:

Safety Target	ECAC Regulator Safety Target	National Regulator Safety Target	
	(/ flight hour)	National Regulator AF	Max Safety Target (/ flight hour)
ST1	1.55E-08	1.55	**1E-08**
ST2	1E-05	1	**1E-05**
ST3	1E-04	1	**1E-04**
ST4	1E-02	1	**1E-02**
ST5	n/a	n/a	n/a

Table 1: Specification of National Regulatory RCS

ATMSP Risk Classification Scheme (RCS) has to be specified as follows:

Safety Target	ATMSP Safety Target	
	Recommended ATMSP AF	Max Safety Target (/ flight hour)
ST1	10	**1E-09**
ST2	10	**1E-06**
ST3	10	**1E-05**
ST4	10	**1E-03**

ST5	n/a	n/a

Table 2: Specification of ATMSP RCS

The specification of RCS in accordance with ED-125 has to be performed as follows:

1. ECAC Regulator Safety Targets have to be adopted as the overriding maximum allowable Safety Targets;

2. A minimum National Regulator Ambition Factor (AF) of 1.55 has to be applied to Severity Class 1 and a minimum of 1 applied to severity classes 2, 3 and 4;

3. A minimum ATMSP Ambition Factor (AF) of 10 has to be applied to all National Regulator Safety Targets.

Table 1 and Table 2 explanatory notes:

1. ECAC Regulator Safety Target for Severity Class 1 is taken from ESARR4;

2. Safety Targets for Severity Class 2, 3 and 4 are set by ED-125 through consideration of data and expert judgment;

3. National Regulator Safety Target = ECAC Safety Target / National AF;

4. ATMSP Safety Target = National Regulator Safety Target / ATMSP AF;

5. ST5 is not provided in this document as this Target is not safety related (Severity Class 5: "no immediate effect on safety");

6. Different AFs may be applied to different Severity Classes by National Regulators or ATMSP as required as long as these AFs comply with the minimum values as specified in Table 2.

This document assumes that National Regulators publish their National RCS in accordance with this document. If National Regulators have already published or will publish National RCS diverting from this document, then ATMSP have to check if their RCS complies with the published National Regulator RCS. This can be an issue only if the National Regulator publishes Safety Targets being more demanding than the ATMSP RCS as recommended in this document. In such case the ATMSP has to use the National Regulator Safety Target(s) being more demanding (e.g. ST2 = 1E-7 /fh) as input to set its own ATMSP RCS and decide the Ambition Factor for this (ese) specific Safety Target(s) (e.g. AF = 1 for ST2).

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