AFI RVSM PRE-IMPLEMENTATION SAFETY CASE APPENDICES

FINAL VERSION

FEBRUARY 2008

READERS NOTES

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Document change record

Version	Issue date	Author	Change Description
0.1	02/06/06	ALTRAN Technologies Julien Lapie, Richard Beaulieu National Aerospace Laboratory (NLR) Geert Moek, Job Smeltink	Initial working draft for ARMA review
0.2	09/06/06	ALTRAN Technologies Julien Lapie, Richard Beaulieu National Aerospace Laboratory (NLR) Geert Moek, Job Smeltink	Working draft for initial AFI RVSM Project Management Team (PMT) review
0.3	23/06/06	ALTRAN Technologies Julien Lapie, Richard Beaulieu National Aerospace Laboratory (NLR) Geert Moek, Job Smeltink	Second working draft for initial AFI RVSM Project Management Team (PMT) review
0.4	08/11/06	ALTRAN Technologies Julien Lapie, Richard Beaulieu National Aerospace Laboratory (NLR) Geert Moek, Job Smeltink	Third working draft for initial AFI RVSM Project Management Team (PMT) review. Includes amendments following Core Team response to open issues
0.5	15/12/06	ALTRAN Technologies Julien Lapie, Richard Beaulieu National Aerospace Laboratory (NLR) Geert Moek, Job Smeltink	Fourth working draft following AFI RVSM Task Force 11
0.6	08/11/06	ALTRAN Technologies Julien Lapie, Richard Beaulieu National Aerospace Laboratory (NLR) Geert Moek, Job Smeltink	Fifth working draft for AFI RVSM Task Force 12
0.7	30/07/07	ALTRAN Technologies Julien Lapie, Richard Beaulieu National Aerospace Laboratory (NLR) Geert Moek, Job Smeltink	Fifth working draft following AFI RVSM Task Force 13
Final	27/02/08	AFI RVSM Project Management Team	Final copy following AFI RVSM PMT Johannesburg 25 – 27 Feb 2008

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Appendix A: AFI RVSM System

A.1 Introduction

This section provides an overview of the AFI RVSM (Reduced Vertical Separation Minimum) System, subject of the Pre Implementation Safety Assessment, purpose of this document.

This AFI RVSM System is a generic system designed following the application of the ICAO RVSM Concept in the AFI Region. States shall implement its elements into their national airspace, in compliance with its generic design and with additional requirements that may prevail.

It should be noted that a higher-level System decomposition is used in the FHA. This one has been further detailed in this document, in particular for the purpose of the detailing and allocation of the System Element Requirements (refer to **section 3.3.5**).

A.2 System definition

The AFI RVSM System is defined (in the ATM sense) by the elements of the AFI Air Navigation System (ANS) involved in RVSM operations. It is composed of a ground based ATM component and an airborne ATM component providing or operating RVSM services.

The AFI RVSM System, as an ATM system (refer to **Annex 2** for definitions), includes three constituent elements that are human, procedures and equipment (hardware and software). It assumes the existence of a supporting CNS system.

A.3 System purpose

The purpose of the AFI RVSM System is to provide - between FL290 and FL410 inclusive – a 1000 feet vertical separation service to Civil and State RVSM approved aircraft and 2000 feet to State aircraft. In other words, the purpose of the System is to provide six additional flight levels between FL290 and FL410.

Non-RVSM approved civil aircraft are not allowed to operate within the AFI RVSM Airspace but are allowed to transit through (descent from above FL410 to below FL290 or climb from below FL290 to above FL410), provided the aircraft climbs or descends at no less than standard rate and does not stop at any intermediate flight level in RVSM airspace[1].

The operational concept of AFI RVSM is provided in *the ATC operations manual for Implementation of RVSM in the AFI Region*. It has been captured in the form of operational scenarios and operating methods for the purpose of the FHA (refer to Appendix C of the *AFI RVSM Functional Hazard Assessment* document).

A.4 System boundaries

Geographical boundaries

The AFI RVSM airspace is composed of the following Flight Information Regions/Upper Information Regions (FIRs/UIRs):

Accra	Addis Ababa	Algiers	Antananarivo
Asmara	Beira	Brazzaville	Cairo
Canarias	Cape Town	Dakar	Dakar Oceanic
Dar es Salaam	Entebbe	Gaborone	Harare
Johannesburg	Johannesburg Oceanic	Kano	Khartoum
Kinshasa	Lilongwe	Luanda	Lusaka
Mauritius	Mogadishu	Nairobi	Ndjamena
Niamey	Roberts	Sal Oceanic	Seychelles
Tripoli	Windhoek	Tunis	Casablanca

Table 1: AFI RVSM Airspace

It includes airspace where RVSM operations are already conducted as a result of RVSM implementation in the EUR/SAM corridor and in the ICAO CAR/SAM and MID Regions.

It is assumed that all States whose sovereign airspace falls within this description will implement RVSM at the same date and time, with the above exception. The States participating to the AFI RVSM Programme are listed in **section 1.2**.

Operational boundaries

RVSM will be operated between FL290 and FL410 inclusive.

A.5 Environmental Types

The AFI operational environment in which RVSM will be operated is inhomogeneous in terms of ATM operations and CNS capabilities. The AFI FIR's offer different level of Air Traffic Services from Flight Information Services to radar Air Traffic Control.

The following Environmental Types are considered:

Reference	Environmental Conditions
ENV_1	Controlled airspace with radar or ADS surveillance capability. Surveillance enables the controller to detect incorrect aircraft movement.
ENV_2	Controlled airspace without radar and ADS surveillance capabilities. Surveillance is procedural and based on communications.
ENV_3	Non controlled (FIS) airspace with radar or ADS surveillance capability. Surveillance enables the controller to detect incorrect aircraft movement.
ENV_4	Non controlled (FIS) airspace without radar and ADS surveillance capabilities.

Table 2: AFI RVSM environnemental types

A.6 System Elements

For the purpose of the Pre-implementation Safety Assessment, the AFI RVSM System is considered to comprise the following elements:

- Overall system (RVSM)
- System monitoring (SM)
- Airspace Design (AD)
- Flight Crew and Operator Procedures (FCOP), sub-composed of:
    - Normal Procedures (FCOP_1)
    - Planning Procedures (FCOP_2)
    - Contingency Procedures (FCOP_3)
    - Transiting Procedures (FCOP_4)
- Flight Crew and Operator Training (FCOT), sub-composed of:
    - Training for normal procedures (FCOT_1)
    - Training for planning procedures (FCOT_2)
    - Training for contingency procedures (FCOT_3)
    - Training for transiting procedures (FCOT_4)
- Aircraft and operator equipment (ACOE)
- ATS Procedures (ATSP) sub-composed of:
    - Normal Procedures (ATSP_1)
    - Contingency Procedures (ATSP_2)
    - Transiting Procedures (ATSP_3)
- ATS Training (ATST), sub-composed of:
    - Training for normal procedures (ATST_1)
    - Training for contingency procedures (ATST_2)
    - Training for transiting procedures (ATST_3)
- ATS Equipment (ATSE).

It should be noted that the ATS personnel encloses both civil and military ATS controllers, as well as the technical staff responsible for ATS equipment maintenance. The transiting procedures refer to the transit of non-RVSM civil aircraft through the RVSM airspace, as part of the AFI RVSM System purpose.

This structure of the AFI RVSM System gives six basic elements, namely FCOP, FCOT, ACOE, ATSP, ATST and ATSE, resulting from the subdivision into a ground and an airborne ATM components, and into the three constituent elements of the System (in the ATM sense): training, procedures and equipment (hardware and software).

These six basic elements are combined with three more elements at System level, namely RVSM, AD and SM.

Appendix B: Functional Hazard Assessment

B.1 Introduction

This section presents a summary of the *AFI RVSM Functional Hazard Assessment* document.

It includes a brief explanation of the purpose, scope and objectives, an overview of the methodology, and a brief summary of the conclusion.

The aim is only to provide understanding elements. The complete details can be found in the document itself.

B.2 Purpose

The Functional Hazard Assessment has been conducted for the AFI RVSM Programme following the Safety Objective **(i)** (refer to **section 2.2.3**) of the AFI RVSM Safety Policy Error! Reference source not found.:

"The RVSM Programme shall conduct a full Functional Hazard Analysis looking at the whole system including air and ground segments and the proposed operational concept. This analysis shall adopt a total aviation system perspective and a risk based approach to the classification of hazards. The analysis shall include, but not be restricted to, those risks already identified by ICAO for RVSM implementation"

B.3 Scope

The *AFI RVSM Safety Policy* document requires the AFI RVSM FHA "to look at the whole RVSM concept" and to cover:

- The situation whereby RVSM has been operational for one year, is fully operational and all introductory problems have been resolved; so-called "AFI RVSM Core Airspace";
- A 24 hours period of time around the actual change-over from CVSM to RVSM, so-called "AFI RVSM Switch-over period"

The particular situation in States which have to ensure the transition between RVSM and non-RVSM airspace, so-called transition airspace, has been removed from the initial scope of the FHA as a result of CAR/SAM RVSM Implementation in January 2005. The assessment nevertheless historically completed so far for that particular situation can be found in the *report of first FHA brainstorming session*.

B.4 Objectives

The FHA objectives were:

- To identify and classify all hazards and risks associated with RVSM;
- To specify the safety objectives associated with the hazards identified and to assess their achievement by expert judgment;
- To determine the integrity safety requirements formally specifying the necessary[2] risk reduction measures and to be met by the AFI RVSM System and.
- To allocate the integrity safety requirements to the constituent elements of the generic AFI RVSM System.

B.5 Methodology

The AFI RVSM FHA was developed in compliance with the EUROCONTROL EATMP Safety Assessment Methodology (SAM) developed by the EUROCONTROL Safety & Quality Management and Standardisation Unit.

With reference to the SAM process, the AFI RVSM FHA consists of:

- a SAM Functional Hazard Assessment
- a SAM Preliminary System Safety Assessment (first steps)[3]

The detailed process can be found in Annex C of the *AFI RVSM Functional Hazard Assessment* document.

B.6 Environmental types

In addition, as the surveillance capabilities and level of ATM services differ from FIR to FIR within the AFI Region, four different environmental types when identifying and assessing the hazards:

Reference	Environnemental conditions
ENV_1	Controlled airspace with radar or ADS surveillance capability. Surveillance enables the controller to detect incorrect aircraft movement.
ENV_2	Controlled airspace without radar and ADS surveillance capabilities. Surveillance is procedural and based on communications.
ENV_3	Non controlled (FIS) airspace with radar or ADS surveillance capability. Surveillance enables the controller to detect incorrect aircraft movement.
ENV_4	Non controlled (FIS) airspace without radar and ADS surveillance capabilities.

[2] In this context, necessary means necessary to achieve the tolerable risk levels defined in the Risk Classification Scheme.
[3] In the sense that the allocation of the safety objectives and requirements has been conducted at a high level of the ATM architecture

B.7 Severity Classification Scheme

The Severity Classification Scheme (SCS) constitutes one fundamental of the methodology. It provides the framework for assigning a severity class to a defined hazard. This severity class gives an indication on the impact on the safety of RVSM operations in case the hazard arises.

The SCS applicable for the AFI RVSM FHA is based on the EUROCONTROL Safety Regulatory Requirement 4 *"Risk Assessment and Mitigation in ATM"* with minor modifications for communicating and understanding.

It is presented in Annex D of the *AFI RVSM Functional Hazard Assessment* document, as approved by the AFI RVSM Task Force 5.

As the severity assessment is a subjective process, an additional matrix has been developed in compliance with the SCS, in order to enhance communicating and understanding and to support decisions during the brainstorming sessions. This so-called 'decision matrix' is provided in Annex D of the *AFI RVSM Functional Hazard Assessment* document.

B.8 Risk Classification Scheme

The Risk Classification Scheme (RCS) constitutes the second fundamental of the methodology. It provides the risk tolerance criteria, i.e. the framework for deriving a safety objective (maximum likelihood at which a hazard can be tolerated to occur) according to a severity class.

It is presented in Annex E of the *AFI RVSM FHA*, as approved by the AFI RVSM Task Force 5.

B.9 Brainstorming sessions

Three brainstorming sessions have been conducted in support of the FHA process as detailed in Appendix A of the *AFI RVSM FHA* document:

- Session 1: 1-5 November 2004 (refer to guidelines and report listed in **Annex 1**)
- Session 2: 31 January- 4 February 2005 (refer to guidelines and report listed in **Annex 1**)
- Session 3: 4-8 April 2005 (refer to guidelines and report listed in **Annex 1**)

The three sessions were attended by 57 participants from AFI States and International Organisations, namely ICAO, ARMA, IATA and IFALPA. These 57 delegates form the AFI RVSM FHA Brainstorming Group. The composition is detailed in Appendix B of the *AFI RVSM FHA*.

The Group has been structured into five categories:

- Air traffic controllers
- Pilots
- Flight safety inspectors, airworthiness and certification engineers
- ATM experts, National Program Managers (NPM), and
- CNS engineers.

Its composition can be illustrated as follows:

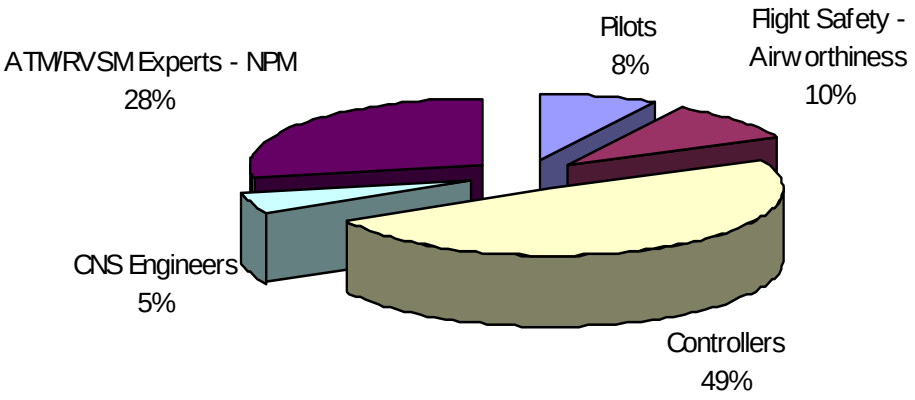

Figure 1: AFI RVSM working group composition

This composition reflects that the experts represents the various groups of people who will design or develop as well as work with the future AFI RVSM system, ensuring the representative outcome of the sessions.

In addition, it has been mentioned the great involvement from the delegates and the maturity reached by the Group in a very short time, giving further confidence in the relevance and completeness of the results.

B.10 Conclusion

The FHA process leads to the identification, assessment and classification of twenty eight (28) hazards for the Core Airspace and twenty (20) hazards.

This outcome is detailed in the Hazard Classification Tables provided in Appendix D of *the AFI RVSM FHA.*

In addition, the risk mitigation strategy has introduced a set of 104 safety requirements for the core airspace and 63 for the switch-over period. This set of requirements specifies the risk mitigation measures necessary to consider the risks as tolerable. Only the risk arising from the hazard AH_{core}_11 'pilot deviates from clearance' remains not tolerable after this process.

This outcome is detailed in the Hazard Classification Tables provided in Appendix E (*AFI RVSM FHA*).

The set of safety requirements have been allocated to the AFI RVSM System elements, as detailed in the Allocation Tables provided in Appendix F (*AFI RVSM FHA*)..

The FHA concludes of follows:

"All the risks identified for the AFI RVSM Core Airspace (except AH_{core}_11 in ENV_2) and Switch-Over Period have been assessed as tolerable provided the proposed mitigation is implemented"

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Appendix C: AFI RVSM System Elements Requirements specification

This appendix presents the set of AFI RVSM System Elements Requirements (SER) as resulting from the detailing and allocation to the System Elements, as discussed in **section 3.3.5**.

It presents the following elements as extracted from the "*AFI RVSM PISC System Elements Requirements specification and approach of satisfaction*" document (cf. **Annex 1** for reference details):

- Firstly, the table form used for the presentation of the SER; and then,
- The SER themselves respectively for the AFI RVSM Core Airspace and Switch-Over Period.

C.1 Introduction

The set of System Elements Requirements (SER) is presented in tables which take the following form:

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
System element or sub-element designation	**SER reference**	**SER statement**	**Source of the requirement (integrity safety requirement or high-level safety requirement)**	**Backward reference to the FHA hazards/risks associated with the integrity safety requirement (if appropriate)**	**Operational environment(s) in which the SER is applicable**

Table 3 : System Elements Requirements table form

Referencing rules of FHA hazards, integrity safety requirements and operational environments (environmental types) can be found in Annex F of the FHA document.

C.2 AFI RVSM Core Airspace

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
FCOP_1: Flight Crew and Operator Normal Procedures	FCOP1	Flight Crew procedures shall be specified for RVSM operations (including use of new FLAS/FLOS)	AFI RVSM 2	-	AIR
	FCOP_1-1	Flight Crew procedures for read back shall be reinforced	Req Core_29	AH Core 9, AH Core 10, AH Core 11	AIR
	FCOP_1-2	New operator procedures shall include the checking/assurance that for operation in AFI RVSM airspace, the aircraft equipment meets the RVSM MASPS requirements	Req Core_1	AH Core 1, AH Core 2, AH Core 3, AH Core 4	AIR
	FCOP_1-3	New Flight Crew Procedures to check RVSM Status before departure shall be specified	Req Core_60	AH Core 17	AIR
	FCOP_1-4	Transferring procedure for flight crew shall be defined (e.g. State Level/RVSM Status before FIR entry)	Req Core_41	AH Core 12	AIR
	FCOP_1-5	Flight Crew procedures to limit Climbing/descent rate during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min) shall be defined	Req Core_87	AH Core 25	AIR
FCOP_2: Flight Crew and Operator Planning Procedures	FCOP2	Flight planning procedures shall be revised and reinforced for RVSM	AFI RVSM 1 Req Core_58	AH Core 17, AH Core 18	AIR
	FCOP_2-1	Operators Flight planning procedures shall take into account weather forecast	Req Core_66 Req Core_73	AH Core 19 AH Core 20 AH Core 21	AIR
	FCOP_2-2	Weather forecast shall be in place to inform flight crew and operators about areas with potential severe turbulence and/or bad weather conditions	Req Core_65 Req_Core_72	AH Core 19 AH Core 20 AH Core 28	AIR
	FCOP_2-3	Operator shall send CHG message when appropriate	Req Core_57	AH Core 17, AH Core 18	AIR
FCOP_3: Flight Crew and Operator Contingency Procedures	FCOP3	Flight Crew in flight contingencies shall be specified	AFI RVSM 7	-	AIR
	FCOP_3-1	New Flight Crew Procedures to suspend RVSM shall be specified	Req Core_101	AH Core 19, AH Core 20	AIR
	FCOP_3-2	Flight Crew Procedures to report encountered vortices shall be defined	Req Core_83	AH Core 21	AIR
	FCOP_3-3	Flight Crew Contingency Procedures shall be defined to provide 2000 feet separation for non RVSM civil aircraft	Req Core_2	AH Core 1, AH Core 2, AH Core 3, AH Core 4, AH Core 5	AIR
	FCOP_3-4	Flight Crew Contingency Procedures shall be defined to execute lateral/level deviation from RVSM level for non RVSM civil aircraft	Req Core_3	AH Core 1, AH Core 2, AH Core 3, AH Core 4	AIR
	FCOP_3-5	Flight Crew Contingency Procedures shall be defined to exit non RVSM civil aircraft from RVSM Airspace	Req Core_4	AH Core 1, AH Core 2, AH Core 3, AH Core 4, AH Core 5	AIR
	FCOP_3-6	Flight Crew Radio Communications Failure procedures shall be defined	Req Core_9	AH Core 6, AH Core 7	AIR

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
	FCOP_3-7	Flight Crew Contingency procedures regarding not forecast severe turbulence shall be defined	Req Core_69 Req Core_75	AH Core 19, AH Core 20	AIR
	FCOP_3-8	Flight Crew Contingency procedures regarding wake turbulence shall be defined	Req Core_80	AH Core 21	AIR
	FCOP_3-9	Flight Crew Contingency procedures for Non-RVSM civil aircraft facing severe icing or turbulence shall be defined	Req Core_98	AH Core 28	AIR
	FCOP_3-10	Flight Crew Specific procedures to avoid deviation due to incorrect visual perspective shall be defined	Req Core_90	AH Core 26	AIR
	FCOP_3-11	Flight Crew emergency contingencies shall be specified	Req Core_84	AH Core 22, AH Core 23	AIR
FCOP_4: Flight Crew and Operator Transiting Procedures	FCOP4	Non RVSM-approved civil aircraft transiting procedures (including contingencies) shall be defined	AFI RVSM 3	AH Core 5	AIR
FCOT_1: Flight Crew and Operator Training for Normal Procedures	FCOT1	Flight Crew shall be trained regarding AFI RVSM procedures	AFI RVSM 2	-	AIR
	FCOT_1-1	Flight Crew Training shall include use of procedures for the checking/assurance that, for operation in AFI RVSM airspace, the aircraft equipment meets the RVSM MASPS Requirement	Req Core_1	AH Core 1, AH Core 2, AH Core 3, AH Core 4	AIR
	FCOT_1-2	Flight crew shall be trained appropriately regarding RVSM Status checking before departure	Req Core_61	AH Core 17	AIR
	FCOT_1-3	Flight Crew shall be trained to report negative RVSM Status on the initial call on any frequency within the AFI RVSM airspace	Req Core_64	AH Core 18	AIR
	FCOT_1-4	Flight Crew shall be trained appropriately with regards to RVSM Procedures including correct use of FLAS	Req Core_25	AH Core 9, AH Core 10, AH Core 11	AIR
	FCOT_1-5	Flight Crew shall be trained appropriately with regards to RVSM Procedures (including read back for clearance and leaving/reaching level)	Req Core_31 Req Core_35	AH Core 9, AH Core 10, AH Core 11	AIR
	FCOT_1-6	Flight Crew Training shall include use of procedures for limiting Climbing/descent rate during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min)	Req Core_87	AH Core 25	AIR
	FCOT_1-7	Pilots shall be trained appropriately to TCAS operations (initial and continuous training)	Req Core_89	AH Core 25, AH Core 26	AIR

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
	FCOT_1-8	Flight crew shall be trained appropriately with regards to the transfer procedures	Req Core_42	AH Core 12	AIR
	FCOT_1-9	Pilots awareness on reporting accuracy shall be reinforced by training	Req Core_33	AH Core 9, AH Core 10	AIR
FCOT_2: Flight Crew and Operator Training for Planning Procedures	FCOT2	Operator and flight crew shall be appropriately trained with regards to flight planning procedures revised for RVSM operations	AFI RVSM 1 Req Core_59	AH Core 17	AIR
	FCOT_2-1	Operator staff shall be trained to send CHG message when appropriate	Req Core_57	AH Core 17, AH Core 18	AIR
	FCOT_2-2	Operator and flight crew shall be appropriately trained with regards to the consideration of turbulence and bad weather forecast when flight planning	Req Core_67 Req Core_74	AH Core 19 AH Core 20, AH Core 28	AIR
FCOT_3: Flight Crew and Operator Training for Contingency Procedures	FCOT3	Flight crew shall be trained appropriately with regards to in flight contingencies	AFI RVSM 5	-	AIR
	FCOT_3-1	Flight crew shall be trained to report significant weather encountered en-route	Req Core_68 Req Core_97	AH Core 19, AH Core 20, AH Core 28	AIR
	FCOT_3-2	Flight Crew shall be trained appropriately regarding suspension of RVSM	Req Core_104	AH Core 19, AH Core 20	AIR
	FCOT_3-3	Flight crew shall be trained appropriately with regards to contingency procedures in case of MASPS requirements failure	Req Core_6	AH Core 1, AH Core 2, AH Core 3, AH Core 4	AIR
	FCOT_3-4	Flight crew shall be trained appropriately regarding contingency procedures related to not forecast turbulence	Req Core_71 Req Core_77	AH Core 19 AH Core 20	AIR
	FCOT_3-5	Flight crew shall be trained appropriately regarding contingency procedures related to wake turbulence	Req Core_82	AH Core 21	AIR
	FCOT_3-6	Flight crew operating Non-RVSM aircraft shall be trained appropriately to contingency procedures related to Non-RVSM aircraft facing severe icing or turbulence	Req Core_100	AH Core 28	AIR
	FCOT_3-7	Flight crew shall be trained appropriately with regards to emergency contingencies	Req Core_85	AH Core 22, AH Core 23	AIR
	FCOT_3-8	Flight crew shall be trained appropriately with regards to Radio Communications Failure procedures	Req Core_11	AH Core 6, AH Core 7	AIR
	FCOT_3-9	Flight crew shall be trained appropriately with regards to ATS/DS failure (awareness training)	Req Core_20	AH Core 8	AIR
FCOT_4: Flight Crew and Operator Training for Transiting Procedures	FCOT4-1	Flight crew shall be trained appropriately with regards to Non-RVSM approved civil aircraft transiting procedures (including contingencies)	Req Core_8	AH Core 5	AIR

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
ACOE_1: Operator and Aircraft Equipment	AC1	RVSM- approved aircraft height-keeping shall be consistent with a TLS of 2.5 x 10-9	RVSM 4	-	AIR
	AC2	RVSM- approved aircraft height-keeping shall continue to be consistent with a TLS of 2.5 x 10-9	RVSM 8	-	AIR
	ACOE_1-1	Aircraft shall meet MASPS requirements	Req Core_1	AH Core 1, AH Core 2, AH Core 3, AH Core 4	AIR
	ACOE_1-2	Aircraft shall be equipped with ACAS II (TCAS version 7.0)	Req Core_88	AH Core 25	AIR
	ACOE_1-3	Weather forecast equipment shall be in place to inform flight crew and operators about areas with severe turbulence	Req Core_65	AH Core 19	AIR
	ACOE_1-4	Weather forecast equipment shall be in place to inform flight crew and operators about bad weather conditions	Req Core_72	AH Core 20, AH Core 28	AIR
	ACOE_1-5	Operator equipment to send CHG message when appropriate shall be in place	Req Core_57	AH Core 17, AH Core 18	AIR
	ACOE_1-6	Operator flight plan filling capabilities shall be reinforced	Req Core_58	AH Core 17, AH Core 18	AIR
ATSP_1: ATS Normal Procedures	ATSP1a	Clearance procedures shall be revised to clear only RVSM civil aircraft and State aircraft into the RVSM airspace	-	AFI RVSM 1	ENV1 ENV3
	ATSP1b	ATS Procedures shall be specified for RVSM operations (including use of new FLAS/FLOS)	-	AFI RVSM 2	All
	ATSP_1-1	ATS Procedures for read back shall be reinforced	Req Core_29	AH Core 9, AH Core 10, AH Core 11	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_1-2	Crosscheck between controllers shall be performed	Req Core_28	AH Core 9, AH Core 10	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_1-3	ATS Transfer procedures (including read back and RVSM/Non RVSM Status) shall be defined in LoA	Req Core_16 Req Core_37 Req Core_39 Req Core_41 Req Core_56	AH Core 8, AH Core 12, AH Core 16	ENV 1 ENV 2 ENV 3 ENV 4
		ATS Coordination procedures shall be defined in the Civil – Military LoA	Req Core_91	AH Core 27	ENV 1 ENV 2 ENV 3 ENV 4

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
	ATSP_1-4	ATS Procedures regarding knowledge of RVSM status shall be defined	Req Core_62	AH Core 17	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_1-5	Climbing/descent rate shall be limited during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min)	Req Core_87	AH Core 25	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_1-6	Air/Ground Communications system maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement	Req Core_13	AH Core 7	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_1-7	Ground/Ground Communication system maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement	Req Core_21	AH Core 8	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_1-8	FDPS/RDPS/ ADS system maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement.	Req Core_45 Req Core_48 Req Core_52	AH Core 13 AH Core 14 AH Core 15	ENV 1 ENV 3
		FDPS system maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement.	Req Core_48	AH Core 14	ENV 2 ENV 4
	ATSP_1-9	Weather forecast procedures shall be in place to inform ATC about areas with potential severe turbulence and/or bad weather conditions	Req Core_65 Req Core_72	AH Core 19 AH Core 20 AH Core 28	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_1-10	Appropriate separation standards shall be specified with regards to wake turbulences	Req Core_78	AH Core 21	ENV 1 ENV 2 ENV 3 ENV 4
ATSP_2: ATS Contingency Procedures	ATSP2	Revised contingency procedures shall be defined	AFI RVSM 7	-	All
	ATSP_2-1	ATS Procedures to suspend RVSM shall be defined	Req Core_101	AH Core 19, AH Core 20	ENV 1 ENV 2 ENV 3 ENV 4
	ATSP_2-2	ATS Procedures to coordinate RVSM suspension with adjacent ACC's	Req	AH Core 19, AH Core	ENV 1

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
		shall be defined	Core_102	20	ENV 2
					ENV 3
					ENV 4
	ATSP_2-3	ATS Contingency Procedures shall be defined to provide 2000 feet separation for non RVSM civil aircraft	Req Core_2	AH Core 1, AH Core 2, AH Core 3, AH Core 4, AH Core 5	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-4	ATS Contingency Procedures shall be defined to exit non RVSM civil aircraft from RVSM Airspace	Req Core_4	AH Core 1, AH Core 2, AH Core 3, AH Core 4, AH_Core 5	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-5	ATS Contingency Procedures shall be defined to execute lateral/level deviation from RVSM level for non RVSM civil aircraft	Req Core_3	AH Core 1, AH Core 2, AH Core 3, AH Core 4	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-6	ATS Radio Communications Failure procedures shall be defined	Req Core_9	AH Core 6, AH Core 7	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-7	ATS Procedures to revert to procedural control shall be specified (due to RDPS/ADS system failure)	Req Core_43	AH Core 13	ENV 1
					ENV 3
		ATS Procedures to revert to procedural control shall be specified (due FDPS / RDPS/ADS system failure)	Req Core_50	AH Core 15	ENV 1
					ENV 3
	ATSP_2-8	ATS Procedures regarding Non-receipt of flight plan shall be defined	Req Core_54	AH Core 16	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-9	ATS Contingency procedures regarding not forecast severe turbulence shall be defined	Req Core_69 Req Core_75	AH Core 19 AH Core 20	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-10	ATS Contingency procedures regarding wake turbulence shall be defined	RVSM 5 Req Core_80	AH Core 21	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-11	ATS Contingency procedures for Non-RVSM aircraft facing severe icing or turbulence shall be defined	Req Core_98	AH Core 28	ENV 1
					ENV 2

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
					ENV 3
					ENV 4
	ATSP_2-12	Emergency contingencies shall be specified	Req Core_84	AH Core 22, AH Core 23	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSP_2-13	ATS Transfer procedures shall be defined in the LoA (including communication failure contingencies)	Req Core_16, Req Core_18	AH Core 8	ENV 1
					ENV 2
					ENV 3
					ENV 4
		Military – Civil coordination Contingency procedures shall be defined in the civil-military LoA	Req Core_94	AH Core 27	ENV 1
					ENV 2
					ENV 3
					ENV 4
ATSP_3: ATS transiting procedures	ATSP3	Procedures facilitating the transit of non-RVSM civil aircraft through the RVSM airspace without intermediate stops shall be defined	AFI RVSM3	-	All
ATST_1: ATS Training for Normal Procedures	ATST1a	Controllers shall be trained appropriately regarding revised clearance procedures	AFI RVSM 1	-	ENV 1
					ENV 3
	ATST1b	Controllers shall be trained appropriately regarding ATS procedures for RVSM operations	AFI RVSM 2	-	All
	ATST_1-1	Controllers shall be trained appropriately regarding knowledge of RVSM status procedures	Req Core_63	AH Core 17	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_1-2	Controllers shall be trained appropriately with regards to RVSM Procedures including correct use of FLAS	Req Core_24	AH Core 9, AH Core 10	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_1-3	Controllers shall be trained appropriately with regards to RVSM Procedures including read back for clearance	Req Core_30	AH Core 9	ENV 1
					ENV 3
		Controllers shall be trained appropriately with regards to RVSM Procedures including read back for report leaving/reaching level	Req Core_34	AH Core 9, AH Core 10	ENV 2
					ENV 4
	ATST_1-4	Controllers shall be trained appropriately with regards to RVSM Coordination Procedures	Req Core_36	AH Core 12	ENV 1
					ENV 2
					ENV 3

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
					ENV 4
	ATST_1-5	Controllers shall be trained appropriately with regards to RVSM civil - military Coordination Procedures	Req Core_92	AH Core 27	ENV 1
					ENV 2
					ENV 3
					ENV 4
		Military controllers shall be trained appropriately with regards to RVSM Coordination Procedures	Req Core_93	AH Core 27	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_1-6	Controllers shall be trained appropriately with regards to transfer procedures	Req Core_17 Req Core_40	AH Core 8, AH Core 12, AH Core 16	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_1-7	Controllers shall be trained on limitation of Climbing/descent rate during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min)	Req Core_87	AH Core 25	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_1-8	Air/Ground Communications Maintenance team shall be trained appropriately with regards to Air/Ground Communication system maintenance procedures	Req Core_14	AH Core 7	ENV 1
					ENV 2
					ENV 3
					ENV 4
		Maintenance team shall be trained appropriately with regards to Ground/Ground Communication system maintenance procedures	Req Core_22	AH Core 8	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_1-9	Maintenance team shall be trained appropriately with regards to FDPS/RDPS/ADS systems maintenance procedures	Req Core_46 Req Core_53	AH Core 13 AH Core 15	ENV 1
					ENV 3
		Maintenance team shall be trained appropriately with regards to FDPS systems maintenance procedures	Req Core_49	AH Core 14	ENV 2
					ENV 4
	ATST_1-10	Controllers shall be trained appropriately regarding Appropriate separation standards related to wake turbulence	Req Core_79	AH Core 21	ENV 1
					ENV 2
					ENV 3
					ENV 4
ATST_2: ATS Training for	ATST2	Controllers shall be trained appropriately with regards to RVSM contingencies	AFI RVSM 7	-	ENV1
					ENV2

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
Contingency Procedures					ENV3
					ENV4
	ATST_2-1	Controllers shall be trained appropriately regarding suspension of RVSM (including coordination with adjacent ACC's)	Req Core_103	AH Core 19, AH Core 20	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_2-2	Controllers shall be trained appropriately with regards to contingency procedures in case of MASPS requirements failure	Req Core_5	AH Core 1, AH Core 2, AH Core 3, AH Core 4	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_2-3	Controllers shall be trained appropriately with regards to ATS/DS failure contingency procedures	Req Core_19	AH Core 8	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_2-4	Controllers shall be trained appropriately with regards to Radio Communications Failure procedures	Req Core_10	AH Core 6, AH Core 7	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_2-5	Controllers shall be trained appropriately to revert to procedural control in case of FDPS / RDPS/ADS system failure	Req Core_44 Req Core_51	AH Core 13 AH Core 15	ENV 1
					ENV 3
	ATST_2-6	Controllers shall be trained appropriately to operate without FDPS system (blank strip…)	Req Core_47	AH Core 14	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_2-7	Controllers shall be trained appropriately regarding Non-receipt of flight plan	Req Core_55	AH Core 16	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_2-8	Controllers shall be trained appropriately with regards to coordination Contingency procedures (including Military coordination)	Req Core_95	AH Core 27	ENV 1
					ENV 2
					ENV 3
					ENV 4
		Military Controllers shall be trained appropriately with regards to coordination Contingency procedures	Req Core_96	AH Core 27	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATST_2-9	Controllers shall be trained appropriately regarding contingency	Req Core_70	AH Core 19 AH Core	ENV 1

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
		procedures related to not forecast turbulence	Req Core_76	20	ENV 2 ENV 3 ENV 4
		ATC controller shall be trained appropriately regarding contingency procedures related to Non-RVSM aircraft facing severe icing or turbulence	Req Core_99	AH Core 28	ENV 1 ENV 2 ENV 3 ENV 4
		Controllers shall be trained appropriately regarding contingency procedures related to wake turbulence	Req Core_81	AH Core 21	ENV 1 ENV 2 ENV 3 ENV 4
	ATST_2-10	Controllers shall be trained appropriately with regards to emergency contingencies	Req Core_86	AH Core 22, AH Core 23	ENV 1 ENV 2 ENV 3 ENV 4
ATST_3: ATS Training for Transiting Procedures	ATST3	Controllers shall be trained appropriately with regards to Non-RVSM civil aircraft transiting procedures (including contingencies)	AFI RVSM 3 Req Core_7	AH Core 5	ENV 1 ENV 2 ENV 3 ENV 4
ATSE_1: ATS Equipment	ATSE1	ATS equipment shall be modified to indicate and display RVSM status	AFI RVSM 1 Req Core_26	AH Core 9, AH Core 10	ENV1 ENV2 ENV3 ENV4
	ATSE2	Existing conflict detection/alerting capabilities shall be updated to be consistent with RVSM operations	AFI RVSM 2 Req Core_32	AH Core 9, AH Core 10, AH Core 11, AH Core 12	ENV1 ENV3
	ATSE_1-1	Air/Ground Communication system shall be designed to ensure a total coverage of the RVSM airspace with a minimum MTBF of 2 months for a given FIR	Req Core_12	AH Core 7	ENV 1 ENV 2 ENV 3 ENV 4
		ATS/DS Communications system shall be designed to ensure point-to-point between all adjacent ACC's with a minimum MTBF of 2 months for a given Radar / ADS FIR	Req Core_15	AH Core 8	ENV 1 ENV 3
		ATS/DS Communication system shall be designed to ensure point-to-point communications between all adjacent ACC's with a minimum MTBF of 60 years for a given non Radar / ADS FIR	Req Core_23	AH Core 8	ENV 2 ENV 4
	ATSE_1-2	RVSM/Non RVSM Status shall be provided by transferring controller (including when status is downgraded)	Req Core_37	AH Core12	ENV 1 ENV 2

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
					ENV 3
					ENV 4
	ATSE_1-3	Suitable and reliable ground communications means shall be implemented	Req Core_38	AH Core 12	ENV 1
					ENV 2
					ENV 3
					ENV 4
	ATSE_1-4	Weather forecast equipment shall be in place to inform ATC about areas with severe turbulence	Req Core_65	AH Core 19	ENV 1
					ENV 2
					ENV 3
					ENV 4
		Weather forecast equipment shall be in place to inform ATC about bad weather conditions	Req Core_72	AH Core 20, AH Core 28	ENV 1
					ENV 2
					ENV 3
					ENV 4
AD: Airspace Design	AD1	An appropriate Flight Level Orientation Scheme shall be developed	AFI RVSM 2	-	All
	AD2	Airspace facilities for emergency situations shall be provided	AFI RVSM 7	-	All
SM: System Monitoring	SM1	The exclusion of non-RVSM approved non-State aircraft from AFI RVSM airspace shall be monitored	AFI RVSM 1	-	All
	SM2	The height-keeping performance of RVSM-approved aircraft shall be monitored	AFI RVSM 8	-	All
	SM3	Data on operational errors shall be collected for collision risk estimation	AFI RVSM 8	-	All
	SM4	Data on risk exposure shall be collected for collision risk estimation	AFI RVSM 8	-	All
	SM5	Data on ACAS/TCAS events shall be collected and evaluated	AFI RVSM 8	-	All
RVSM: Overall System	RVSM5	The probability of any system failure leading to a mid-air collision shall be sufficiently low for the risk of mid-air collision due to the loss of vertical separation from all causes in AFI RVSM airspace to meet a TLS of 5×10^{-9} fatal accidents per flight hour.	AFI RVSM 5	-	All
	RVSM6	The system shall be sufficiently reliable for the number of ATM-induced accidents and serious or risk-bearing incidents in AFI RVSM airspace not to increase from current CVSM levels and, where, possible to decrease.	AFI RVSM 6	-	All

Table 4 : AFI RVSM “Core Airspace” System Element Requirements

C.3 AFI RVSM Switch-over period

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
FCOP_1: Flight Crew and Operator Normal Procedures	S_FCOP_1-1	A NOTAM shall be issued for the activation of the new FLAS during the switch-over period	Req Swit_10	AH Swit 2, AH Swit 3, AH Swit 4, AH Swit 5, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 20	AIR
	S_FCOP_1-2	Flight Crew Switch-over Procedures shall be in place to impose the read back for level clearance during the switch-over period	Req Swit_11	AH Swit 2, AH Swit 4	AIR
	S_FCOP_1-3	Flight Crew Switch-over Procedures shall be in place to impose the surveillance of the level change during the switch-over period	Req Swit_18	AH Swit 3, AH Swit 5, AH Swit 7	AIR
	S_FCOP_1-4	Use of Eastbound RVSM FL (FL310, FL350 and FL390) shall be suspended for a period of 02 hours after the T0.	Req Swit_24	AH Swit 5, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 17, AH Swit 18, AH Swit 20	AIR
	S_FCOP_1-5	A NOTAM shall be produced to suspend FL310, FL350 and FL390 for RVSM operations after ToS during a period of 02 hours	Req Swit_25	AH Swit 5, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 17, AH Swit 18, AH Swit 20	AIR
	S_FCOP_1-6	Transit of non-RVSM civil a/c shall be suspended for a period of 02 hours after T0	Req Swit_35	AH Swit 10, AH Swit 11	AIR
	S_FCOP_1-7	Operation above FL410 shall be suspended for non-RVSM a/c for a period of 02 hours after T0	Req Swit_36	AH Swit 10, AH Swit 11	AIR
	S_FCOP_1-8	The traffic flow management capabilities shall be available before the switch-over period	Req Swit_38	AH Swit 12	AIR
FCOP_2: Flight Crew and Operator Planning Procedures	S_FCOP_1	Level change and time/point for non RVSM civil aircraft to leave the FL band 290-410 and above-410 before ToS shall be indicated in the flight plan	Req Swit_62	AH Swit 20	AIR
	S_FCOP_2	Level change and time/point for non RVSM civil aircraft to leave the FL band 290-410 before ToS shall be indicated in the flight plan	Req Swit_33	AH Swit 9	AIR
FCOT_1: Flight Crew and Operator Training for Normal Procedures	S_FCOT_1-1	Awareness campaigns about RVSM Status shall be organized before the switch-over period	Req Swit_1	AH Swit 1	AIR
	S_FCOT_1-2	Flight crew shall be trained appropriately with regards to RVSM procedures before Switch-over period	Req Swit_5	AH Swit 2, AH Swit 3, AH Swit 4, AH Swit 5, AH Swit 6, AH Swit 16, AH Swit 20	AIR

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
	S_FCOT_1-3	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new FLAS (after completion of training for all staff)	Req Swit_6	AH Swit 2, AH Swit 3, AH Swit 4, AH Swit 5, AH Swit 6, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 20	AIR
	S_FCOT_1-4	Flight crew shall be trained appropriately with regards to switch-over procedures(read back for level clearance)	Req Swit_13	AH Swit 2, AH Swit 4	AIR
	S_FCOT_1-5	Flight crew shall be trained appropriately with regards to switch-over procedures related Report reaching level	Req Swit_20	AH Swit 3, AH Swit 5, AH Swit 7	AIR
	S_FCOT_1-6	Awareness campaigns shall be organized before the switch-over period to reinforce the importance of read back	Req Swit_23	AH Swit 5, AH Swit 7	AIR
	S_FCOT_1-7	Flight Crew shall be briefed on the suspension of Eastbound RVSM FL (Fl310, FL350 and FL390) for a period of 02 hours after the T0.	Req Swit_24	AH Swit 5, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 17, AH Swit 18, AH Swit 20	AIR
	S_FCOT_1-8	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new FLAS for operators	Req Swit_26	AH Swit 6	AIR
	S_FCOT_1-9	Flight Crew shall be briefed on the suspension of transit of non-RVSM civil a/c for a period of 02 hours after T0	Req Swit_35	AH Swit 10, AH Swit 11	AIR
	S_FCOT_1-10	Flight Crew shall be briefed on the suspension of operations above FL410 for non-RVSM a/c for a period of 02 hours after T0	Req Swit_36	AH Swit 10, AH Swit 11	AIR
ATSP_1: ATS Normal Procedures	S_ATSP_1-1	ATC shall verify the RVSM status of each aircraft within its area of responsibility before the ToS	Req Swit_3	AH Swit 1	ENV 1 ENV 2 ENV 3 ENV 4
	S_ATSP_1-2	ATC team shall be reinforced during the switch-over period	Req Swit_7	AH Swit 2, AH Swit 3, AH Swit 4, AH Swit 8, AH Swit 9, AH Swit 12, AH Swit 17, AH Swit 20	ENV 1 ENV 2 ENV 3 ENV 4
	S_ATSP_1-3	Switch-over Procedures shall be in place to impose the surveillance of the execution of the level clearance during the switch-over period	Req Swit_8	AH Swit 2, AH Swit 4	ENV 1 ENV 2
	S_ATSP_1-4	A NOTAM shall be issued for the activation of the new FLAS during the switch-over period	Req Swit_10	AH Swit 2, AH Swit 3, AH Swit 4, AH Swit 5,	ENV 1 ENV 2

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
				AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 20	ENV 3
					ENV 4
	S_ATSP_1-5	Switch-over Procedures shall be in place to impose the read back for level clearance during the switch-over period	Req Swit_11	AH Swit 2, AH Swit 4	ENV 1
					ENV 2
	S_ATSP_1-6	Switch-over Procedures shall be in place to recover from incorrect clearance issue	Req Swit_14	AH Swit 2	ENV 1
					ENV 2
	S_ATSP_1-7	Switch-over Procedures shall be in place to impose the surveillance of the execution of the level information during the switch-over period	Req Swit_16	AW Swit 3	ENV 3
					ENV 4
	S_ATSP_1-8	Switch-over Procedures shall be in place to impose the surveillance of the level change during the switch-over period	Req Swit_18	AH Swit 3, AH Swit 5, AH Swit 7	ENV 3
					ENV 4
	S_ATSP_1-9	Switch-over Procedures shall be in place to recover from incorrect information issue	Req Swit_21	AH Swit 3	ENV 3
					ENV 4
	S_ATSP_1-10	Use of Eastbound RVSM FL (Fl310, FL350 and FL390) shall be suspended for a period of 02 hours after the T0.	Req Swit_24	AH Swit 5, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 17, AH Swit 18, AH Swit 20	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-11	A NOTAM shall be produced to suspend FL310, FL350 and FL390 for RVSM operations after ToS during a period of 02 hours	Req Swit_25	AH Swit 5, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 17, AH Swit 18, AH Swit 20	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-12	Switch-over Procedures shall be in place to ensure the delivery of relevant level clearance for non RVSM civil aircraft to leave the FL band 290-410 before ToS	Req Swit_29	AH Swit 8	ENV 1
					ENV 2
	S_ATSP_1-13	Switch-over Procedures shall be in place to ensure the delivery of relevant level information for non RVSM civil aircraft to leave the FL band 290-410 before ToS	Req Swit_31	AH Swit 9	ENV 3
					ENV 4
	S_ATSP_1-14	Transit of non-RVSM civil a/c shall be suspended for a period of 02 hours after T0	Req Swit_35	AH Swit 10, AH Swit 11	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-15	Operation above FL410 shall be suspended for non-RVSM a/c for a period of 02 hours after T0	Req Swit_36	AH Swit 10, AH Swit 11	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-16	The traffic flow management capabilities shall be available before the switch-over period	Req Swit_38	AH Swit 12	ENV 1
					ENV 2

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
					ENV 3
					ENV 4
	S_ATSP_1-17	Modification to existing reliable communication systems (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_43	AH Swit 13	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-18	Maintenance staff shall be reinforced during switch over period	Req Swit_45	AH Swit 13, AH Swit 14, AH Swit 15	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-19	Flight plan shall be checked for non RVSM civil aircraft to leave the FL band 410 and above before ToS (Level change and time/point)	Req Swit_63	AH Swit 20	ENV 3
					ENV 4
	S_ATSP_1-20	Flight plan shall be checked for non RVSM civil aircraft to leave the FL band 290-410 before ToS (Level change and time/point)	Req Swit_34	AH Swit 9	ENV 3
					ENV 4
	S_ATSP_1-21	LoA's and Procedures shall be in place before Switch-over period	Req Swit_53	AH Swit 17	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-22	Civil/Military coordination procedures shall be in place before Switch-over period	Req Swit_56	AH Swit 18	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSP_1-23	Switch-over Procedures shall be in place to ensure the delivery of relevant level information for non RVSM civil aircraft to leave the FL band 290-410 before ToS	Req Swit_61	AH Swit 20	ENV 3
					ENV 4
ATSP_2: ATS Contingency Procedures	S_ATSP_2-1	RDPS/ADS system failure contingencies shall be defined before the switch over period	Req Swit_47	AH Swit 14	ENV 1
					ENV 3
	S_ATSP_2-2	HMI failure contingencies shall be defined before the switch over period	Req Swit_46	AH Swit 14	ENV 1
					ENV 3
	S_ATSP_2-3	FDPS failure contingencies shall be defined before the switch over period	Req Swit 50	AH Swit 15	ENV 1
					ENV 2
					ENV 3
					ENV 4
ATST_1: ATS Training on	S_ATST_1-1	Awareness campaigns about RVSM Status shall be organized before the switch-over period	Req Swit_1	AH Swit 1	ENV 1
					ENV 2

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
Normal Procedures					ENV 3
					ENV 4
	S_ATST_1-2	Controllers shall be trained with regards to the verification of the RVSM status of each aircraft within its area of responsibility before the ToS	Req Swit_3	AH Swit 1	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-3	Controllers shall be trained appropriately with regards to RVSM procedures before Switch-over period	Req Swit_4	AH Swit 2, AH Swit 3, AH Swit 4, AH Swit 5, AH Swit 16, AH Swit 20	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-4	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new FLAS (after completion of training for all staff)	Req Swit_6	AH Swit 2, AH Swit 3, AH Swit 4, AH Swit 5, AH Swit 6, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 20	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-5	Controller shall be trained appropriately with regards to switch-over procedures (surveillance of the execution of the level clearance)	Req Swit_9	AH Swit 2, AH Swit 4	ENV 1
					ENV 2
	S_ATST_1-6	Controller shall be trained appropriately with regards to switch-over procedures (read back for level clearance)	Req Swit_12	AH Swit 2, AH Swit 4	ENV 1
					ENV 2
	S_ATST_1-7	Controller shall be trained appropriately with regards to switch-over procedures (recovering from incorrect clearance issue)	Req Swit_15	AH Swit 2	ENV 1
					ENV 2
	S_ATST_1-8	Controller shall be trained appropriately with regards to switch-over procedures (surveillance of the execution of the level information)	Req Swit_17	AH Swit 3	ENV 3
					ENV 4
	S_ATST_1-9	Controller shall be trained appropriately with regards to switch-over procedures related to the level change	Req Swit_19	AH Swit 3, AH Swit 5, AH Swit 7	ENV 3
					ENV 4
	S_ATST_1-10	Controller shall be trained appropriately with regards to switch-over procedures (recovering from incorrect information issue)	Req Swit_22	AH Swit 3	ENV 3
					ENV 4
	S_ATST_1-11	Controller shall be briefed on the suspension of Eastbound RVSM FL (FL310, FL350 and FL390) for a period of 02 hours after the T0.	Req Swit_24	AH Swit 5, AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 17, AH Swit 18, AH Swit 20	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-12	Controllers shall be trained appropriately with regards to broadcast the switch-over countdown : ToS - 60mn, 45mn, 30mn,15mn , ToS-5mn and ToS	Req Swit_28	AH Swit 7, AH Swit 8, AH Swit 9, AH Swit 20	ENV 1
					ENV 2
					ENV 3
					ENV 4

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
	S_ATST_1-13	Controllers shall be trained appropriately with regards to deliver relevant level clearance for non RVSM civil aircraft to leave the FL band 290-410 before ToS	Req Swit_30	AH Swit 8	ENV 1
					ENV 2
	S_ATST_1-14	Controllers shall be trained appropriately with regards to deliver relevant level information for non RVSM civil aircraft to leave the FL band 290-410 before ToS	Req Swit_32	AH Swit 9	ENV 3
					ENV 4
	S_ATST_1-15	Controller shall be briefed on the suspension of transit of non-RVSM civil a/c for a period of 02 hours after T0	Req Swit_35	AH Swit 10, AH Swit 11	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-16	Controllers shall be briefed on the suspension of operations above FL410 for non-RVSM a/c for a period of 02 hours after T0	Req Swit_36	AH Swit 10, AH Swit 11	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-17	Controllers shall be trained with regards to the checking of flight plan for non RVSM civil aircraft to leave the FL band 290-410 before ToS (Level change and time/point)	Req Swit_34	AH Swit 9	ENV 3
					ENV 4
	S_ATST_1-18	Controllers shall be trained with regards to the checking of flight plan for non RVSM civil aircraft to leave the FL band 410 and above before ToS (Level change and time/point)	Req Swit_63	AH Swit 20	ENV 3
					ENV 4
	S_ATST_1-19	Controller shall be trained appropriately with regards to the checking into the flight plan that FL310, FL350 and FL390 are not intended to be used after ToS	Req Swit_27	AH Swit 7	ENV 3
					ENV 4
	S_ATST_1-20	ATS technical staff shall be aware that modification to existing reliable FDPS (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_51	AH Swit 15	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-21	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new LOA	Req Swit_55	AH Swit 17	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-22	Controller shall be trained appropriately with regards to LoAs and procedures before Switch-over period	Req Swit_54	AH Swit 17	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-23	Controller shall be trained appropriately with regards Civil/Military	Req Swit_57	AH Swit 18	ENV 1

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
		coordination procedures before Switch-over period			ENV 2
					ENV 3
					ENV 4
	S_ATST_1-24	Military Controller shall be trained appropriately with regards Civil/Military coordination procedures before Switch-over period	Req Swit_58	AH Swit 18	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-25	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new Civil/Military coordination procedures	Req Swit_59	AH Swit 18	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-26	Maintenance staff shall be trained appropriately with regards to modified systems before Switch-over period	Req Swit_44	AH Swit 13, AH Swit 14, AH Swit 15	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_1-27	ATS technical staff shall be aware that modification to existing reliable HMI (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_48	AH Swit 14	ENV 1
					ENV 3
	S_ATST_1-28	ATS technical staff shall be aware that modification to existing reliable RDPS/ADS system (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_49	AH Swit 14	ENV 1
					ENV 3
ATST_2: ATS Training on Contingency Procedures	S_ATST_2-1	Maintenance staff shall be trained with regards to RDPS/ADS system failure contingencies before the switch over period	Req Swit_47	AH Swit 14	ENV 1
					ENV 3
	S_ATST_2-2	Maintenance staff shall be trained with regards to FDPS failure contingencies before the switch over period	Req Swit_50	AH Swit 15	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATST_2-3	Maintenance staff shall be trained with regards to HMI failure contingencies before the switch over period	Req Swit_46	AH Swit 14	ENV 1
					ENV 3
ATSE_1: ATS Equipment	S_ATSE_1-1	Upgraded ground system shall be in place to manage the RVSM status information before the switch-over period	Req Swit_2	AH Swit 1	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSE_1-2	ATS Equipment shall enable controller to check flight plan for non RVSM	Req Swit_34	AH Swit 9	ENV 3

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
		civil aircraft to leave the FL band 290-410 before ToS (Level change and time/point)			ENV 4
	S_ATSE_1-3	The traffic flow management capabilities shall be available before the switch-over period	Req Swit_38	AH Swit 12	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSE_1-4	SAT Phone and/or PSTN shall be available for point to point communications during the switch over period	Req Swit_42	AH Swit 13	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSE_1-5	Modification to existing reliable communication systems (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_43	AH Swit 13	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSE_1-6	Modification to existing reliable HMI (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_48	AH Swit 14	ENV 1
					ENV 3
	S_ATSE_1-7	Modification to existing reliable RDPS/ADS system (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_49	AH Swit 14	ENV 1
					ENV 3
	S_ATSE_1-8	Modification to existing reliable FDPS (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Req Swit_51	AH Swit 15	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_ATSE_1-9	ATS equipment shall enable controller to check flight plan for non RVSM civil aircraft to leave the FL band 410 and above before ToS (Level change and time/point)	Req Swit_63	AH Swit 20	ENV 3
					ENV 4
RVSM: Overall system	S_RVSM1	The switch-over period shall be performed during an appropriate low traffic density period	Req Swit_37	AH Swit 12	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_RVSM2	The switch-over period shall be determine out of Hadj period	Req Swit_39	AH Swit 12	ENV 1
					ENV 2
					ENV 3
					ENV 4

System Elements	Reference	System Element Requirement (SER)	Source	FHA Backtrace	Env.
	S_RVSM3	Traffic density shall be limited during switch-over period as appropriate	Req Swit_40	AH Swit 12	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_RVSM4	The FIR airspace shall be optimized to reduce controller workload	Req Swit_41	AH Swit 12	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_RVSM5	The date of switchover shall take into account the effect of adverse weather (thunderstorm, sandstorm, …) to minimize the effect on switch over operations	Req Swit_52	AH Swit 16	ENV 1
					ENV 2
					ENV 3
					ENV 4
	S_RVSM6	Civil/Military coordination committee shall be in place	Req Swit_60	AH Swit 18	ENV 1
					ENV 2
					ENV 3
					ENV 4

Table 5 : AFI RVSM “Switch-over Period” System Element Requirements

Appendix D: AFI RVSM System Element Requirements realisation

This appendix presents the realisation of the AFI RVSM System Elements Requirements (SER) as resulting from the agreed approach of satisfaction, as discussed in sections 4 and 5.

It presents the following elements as extracted from the **"**AFI RVSM PISC System Elements Requirements specification and approach of satisfaction" document:

- Firstly, the table form used for the presentation of the results; and then,
- The results themselves respectively for the AFI RVSM Core Airspace and Switch-Over Period.

D.1 Introduction

The realisation of the System Elements Requirements (SER) is presented in tables which take the following form:

Reference	**System Element Requirement (SER)**	**Realisation at a Concept level (design)**		**Realisation at Implementation level**	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
Requirement reference	**Requirement statement**	**Mean of realisation at a concept level**	**Realisation result**	**Mean of realisation at an implementation level**	**Realisation result**

Table 6 : System Elements Requirements realisation table form

D.2 AFI RVSM Core Airspace

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOP_1	**Flight Crew and Operator Normal Procedures**				
FCOP1	Flight Crew Procedures shall be specified for RVSM operations (including use of new FLAS/FLOS)	Appropriate Flight Crew Procedures (including use of new FLAS/FLOS) to be provided in ICAO 7030 and other material if appropriate	It is shown to have been successfully addressed in ICAO Doc 7030. FLAS/FLOS is addressed in section 8.0 with reference to ICAO Annex 2 (Appendix 3). Additional details can be found in Appendix 4 of TGL6 revision 1 **and in section 5 of ICAO 9574.**	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval.		
FCOP_1-1	Flight Crew Procedures for read back shall be reinforced	Appropriate R/T phraseology for read back to be provided in ICAO PANS-ATM	It is shown to have been successfully addressed in chapter 12, section 12.3.5.8 of ICAO PANS-ATM	How to prove State commitment to comply with PANS-ATM	(we shall ensure that RVSM phraseology, even deleted from ICAO 7030 to be incorporated to PANS-ATM, will be correctly implemented by the States)

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOP_1-2	New operator procedures shall include the checking/assurance that for operation in AFI RVSM airspace, the aircraft equipment meets the RVSM MASPS requirements	Procedures to obtain RVSM approval for aircraft, ensuring compliance with the MASPS to be contained in guidance material to be provided to States	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (sections **6,** and **9**).	The requirements placed on States to ensure that aircraft, from whom they have responsibility, obtain RVSM approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		On-going maintenance programmes and procedures to be contained in guidance material to be provided to States	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **10**).	The requirements placed on States about RVSM approval suspension, revocation and reinstatement for that aircraft from whom they have responsibility	
FCOP_1-3	New Flight Crew Procedures to check RVSM Status before departure shall be specified	Procedures to obtain RVSM approval for operator, containing pre-flight procedures at the aircraft for each flight to determine the condition of equipment required for flight in the RVSM airspace	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOP_1-4	Transferring Procedure for Flight crew shall be defined (e.g. State Level/RVSM Status before FIR entry)	Appropriate transferring procedures to be contained in the ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval.		
FCOP_1-5	Flight Crew Procedures to limit Climbing/descent rate during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min) shall be defined	Appropriate procedures for TCAS operations	It is shown to have been successfully addressed in 8168 –PANS OPS volume 1, chapter 3	Not applicable (not specific to RVSM operations)	-
		Appropriate procedures for limitation of climbing/descent rate during level change, to be contained in the ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval.	RVSM operational approval before operating in RVSM airspace	State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOP_2	**Flight Crew and Operator Planning Procedures**				
FCOP2	Flight planning procedures shall be revised and reinforced for RVSM	Specialised procedures for RVSM flight planning to be contained in the ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval.		

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOP_2-1	Operators Flight planning procedures shall take into account weather forecast	Specialised procedures for flight planning to be contained in TGL6	It is shown to have been successfully addressed in Appendix 4, of TGL6 revision 1 (section 2).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval.		
FCOP_2-2	Weather forecast shall be in place to inform flight crew and operators about areas with potential severe turbulence and/or bad weather conditions	Specialised procedures to inform operator and flight crew on weather forecast	It is shown to have been successfully addressed in section **4.4** of the ICAO 7030 and in Appendix 4, of TGL6 revision 1 (section 2)	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval.		
FCOP_2-3	Operator shall send CHG message when appropriate	Procedures for operator to submit a modification message (CHG) when RVSM approval status is changed, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030 and in chapter 11, section 11.4.2.2.4 of ICAO PANS-ATM	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc7030 addresses the granting for operator approval.	airspace	within the National Safety Plans, reviewed and reported in section 5.3.
FCOP_3	**Flight Crew and Operator Contingency Procedures**				
FCOP3	Flight Crew in flight contingencies shall be specified	In-flight contingencies to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		
FCOP_3-1	New Flight Crew Procedures to suspend RVSM shall be specified	Contingency procedures for suspending RVSM operations in the event of severe turbulence and when aircraft capability(ies) to maintain flight level(s) are impacted, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		Plans, reviewed and reported in section 5.3.
FCOP_3-2	Flight Crew Procedures to report encountered vortices shall be defined	Contingency procedures for flight crew to report encountered vortices that impact the aircraft capability to maintain flight level, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		
FCOP_3-3	Flight Crew Contingency Procedures shall be defined to provide 2000 feet separation for non RVSM civil	Contingency procedures to provide immediately 2000 feet separation to non RVSM civil-aircraft operating in the FL band 290-410, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
	aircraft	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval	airspace	within the National Safety Plans, reviewed and reported in section 5.3.
FCOP_3-4	Flight Crew Contingency Procedures shall be defined to execute lateral/level deviation from RVSM level for non RVSM civil aircraft	Contingency procedures to obtain (when RVSM status of civil a/c is downgraded or when a non RVSM civil a/c transiting through the airspace is levelling off) ATC clearance whenever possible / to inform ATC, prior the initiation of any lateral/level deviation from RVSM level, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		
FCOP_3-5	Flight Crew Contingency Procedures shall be defined to exit non RVSM civil aircraft from RVSM Airspace	Contingency procedures to clear out any non RVSM civil aircraft from RVSM airspace when it is possible to do so, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOP_3-6	Flight Crew Radio Communications Failure procedures shall be defined	Contingency procedures for handling loss of R/T communications, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		
FCOP_3-7	Flight Crew Contingency procedures regarding not forecast severe turbulence shall be defined	Contingency procedures for handling unexpectedly encountered turbulence (affecting the capability to maintain the assigned flight level), to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		
FCOP_3-8	Flight Crew Contingency procedures regarding wake turbulence shall be defined	Contingency procedures for handling encountered wake turbulence (affecting the capability to maintain the assigned flight level), to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval		reported in section 5.3.
FCOP_3-9	Flight Crew Contingency procedures for Non-RVSM civil aircraft facing severe icing or turbulence shall be defined	Contingency procedures for handling non-RVSM civil aircraft facing severe icing and turbulence (affecting the capability for ATC to clear aircraft at flight level below FL290), to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030 and in section 15.1.1 of ICAO PANS-ATM	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11** ICAO Doc 7030 addresses the granting for operator approval		
FCOP_3-10	Flight Crew specific procedures to avoid deviation due to incorrect visual perspective shall be defined	Guidance on flight crew training programmes including special emphasis of problem of visual perception.	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures, and flight crew training programmes.	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section **11**). ICAO Doc 7030 addresses the granting for operator approval		
FCOP3-11	Flight Crew emergency contingencies shall be specified	Contingency procedures for handling aircraft emergencies, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of operating practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **11**). ICAO Doc 7030 addresses the granting for operator approval	before operating in RVSM airspace	realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOP_4	**Flight Crew and Operator Transiting Procedures**				
FCOP4	Non RVSM-approved civil aircraft transiting procedures (including contingencies) shall be defined	Procedures for the transit of non-RVSM civil aircraft at a descend/climbing rate no less than standard rate and prohibiting stop at any intermediate flight level in RVSM airspace, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030. The design of FC procedures facilitating the transit of non-RVSM approved civil aircraft is also addressed	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
		Contingency procedures for handling non-RVSM civil aircraft levelling off in the RVSM airspace, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.		
FCOT_1	**Flight Crew and Operator Training for Normal Procedures**				

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT1	Flight Crew shall be trained regarding AFI RVSM procedures	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_1-1	Flight Crew Training shall include use of procedures for the checking/assurance that, for operation in AFI RVSM airspace, the aircraft equipment meets the RVSM MASPS Requirement	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes and operating practises and procedures.	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_1-2	Flight crew shall be trained appropriately regarding RVSM Status checking before departure	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for pre-flight procedures (at the aircraft, determination for each flight of the condition of equipment required to flight in the RVSM airspace)	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT_1-3	Flight Crew shall be trained to report negative RVSM Status on the initial call on any frequency within the AFI RVSM airspace	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_1-4	Flight Crew shall be trained appropriately with regards to RVSM Procedures including correct use of FLAS	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_1-5	Flight Crew shall be trained appropriately with regards to RVSM Procedures including read back for clearance	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures and phraseology detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
	Flight Crew shall be trained appropriately with regards to RVSM Procedures including read back + leaving/reaching level	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures and phraseology detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_1-6	Flight Crew Training shall include use of procedures for limiting Climbing/descent rate during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min)	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_1-7	Pilots shall be trained appropriately to TCAS operations (initial and continuous training)	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes and operating practices and procedures.	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT_1-8	Flight crew shall be trained appropriately with regards to the transfer procedures	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_1-9	Pilots awareness on reporting accuracy shall be reinforced by training	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes and operating practises and procedures.	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_2	**Flight Crew and Operator Training for Planning Procedures**				

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT2	Flight crew and operator shall be appropriately trained with regards to flight planning procedures revised for RVSM operations	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for flight planning procedures	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT2-1	Operator staff shall be trained to send CHG message when appropriate	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT2-2	Operator and flight crew shall be appropriately trained with regards to the consideration of turbulence and bad weather forecast when flight planning	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for flight planning procedures	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_3	**Flight Crew and Operator Training for Contingency Procedures**				

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT3	Flight crew shall be trained appropriately with regards to in flight contingencies	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for in-flight contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_3-1	Flight crew shall be trained to report significant weather encountered en-route	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_3-2	Flight Crew shall be trained appropriately regarding suspension of RVSM	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes to be in line with RVSM regional procedures detailed in the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT_3-3	Flight crew shall be trained appropriately with regards to contingency procedures in case of MASPS requirements failure	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for in-flight contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_3-4	Flight crew shall be trained appropriately regarding contingency procedures related to not forecast turbulence	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for in-flight contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_3-5	Flight crew shall be trained appropriately regarding contingency procedures related to wake turbulence	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for in-flight contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT_3-6	Flight crew operating Non-RVSM aircraft shall be trained appropriately to contingency procedures related to Non-RVSM aircraft facing severe icing or turbulence	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for in-flight contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT3-7	Flight crew shall be trained appropriately with regards to emergency flight contingencies	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for emergency contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_3-8	Flight crew shall be trained appropriately with regards to Radio Communications Failure procedures	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for in-flight contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
FCOT_3-9	Flight crew shall be trained appropriately with regards to ATS/DS failure (awareness training)	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of training programmes for in-flight contingencies to be in line with RVSM regional procedures detailed in ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Section 6 and Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
FCOT_4-1	**Flight Crew and Operator Training for Transiting Procedures**				
FCOT_4-1	Flight crew shall be trained appropriately with regards to Non-RVSM approved civil aircraft transiting procedures (including contingencies)	Not specific to RVSM approval, because it concerns crew of non RVSM civil aircraft			
ACOE_1	**Aircraft and Operator Equipment**				

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
AC1	RVSM- approved aircraft height-keeping shall be consistent with a TLS of 2.5 x 10-9	Develop height-keeping requirements in MASPS for RVSM	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **7**) and the CRA report (section **3**).	Not applicable	Not applicable
AC2	RVSM- approved aircraft height-keeping shall continue to be consistent with a TLS of 2.5 x 10-9	Develop maintenance requirements for RVSM height-keeping in MASPS	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **10**) and the CRA report (section **3**).	Not applicable	Not applicable
ACOE_1-1	Aircraft shall meet MASPS requirements	Procedures to obtain RVSM airworthiness approval for aircraft (including height-keeping requirement in MASPS)	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section 5, 6, **7**)	The requirements placed on States to ensure that aircraft, from whom they have responsibility, obtain RVSM airworthiness approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
		On-going maintenance programmes and procedures to be contained in guidance material to be provided to States	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (section **10**)	The requirements placed on States about RVSM approval suspension, revocation and reinstatement for that aircraft from whom they have responsibility	
ACOE_1-2	Aircraft shall be equipped with ACAS II (TCAS version 7.0)	Requirements on the mandatory carriage of ACAS II (TCAS version 7.0)	It is shown to have been successfully addressed in ICAO Annex 6 and in the the ATC Manual for RVSM Operations	The requirements placed on States to ensure that aircraft, from whom they have responsibility, obtain approval before operating in RVSM airspace	
ACOE_1-3	Weather forecast equipment shall be in place to inform ATC, flight crew and operators about areas with severe turbulence	Requirements on the mandatory carriage of MET equipment		Not applicable. (already implemented as part of CVSM)	-

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ACOE_1-4	Weather forecast equipment shall be in place to inform ATC, flight crew and operators about bad weather conditions	Requirements on the mandatory carriage of MET equipment		Not applicable. (already implemented as part of CVSM)	
ACOE_1-5	Operator equipment to send CHG message when appropriate shall be in place	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of flight planning practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Appendix **4**)	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ACOE_1-6	Operator flight plan filling capabilities shall be reinforced	Procedures to obtain RVSM approval for operator requiring the submission to the approval authority of flight planning practices and procedures to be in line with RVSM regional procedures provided by the ICAO 7030	It is shown to have been successfully addressed through the guidance material provided in TGL6 revision 1 (Appendix **4**).	The requirements placed on States to ensure that operators, from whom they have responsibility, obtain RVSM operational approval before operating in RVSM airspace	It is shown to have been successfully addressed in the section **2** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_1	**ATS Normal Procedures**				

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP1a	Clearance procedures shall be revised to clear only RVSM civil aircraft and State aircraft into the RVSM airspace	Revised clearance procedures to be detailed in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030. Additional details are contained in section 5.1 of the ATC Manual for RVSM Operations.	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030 and the RVSM ATC operations manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP1b	ATS Procedures shall be specified for RVSM operations (including use of new FLAS/FLOS)	ATS procedures for AFI RVSM operations to be detailed in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030. Additional details are contained in section 5.3 of the ATC Manual for RVSM Operations	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030 and the RVSM ATC operations manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_1-1	ATS Procedures for read back shall be reinforced	Appropriate R/T phraseology for read back to be detailed in ICAO PANS-ATM.	It is shown to have been successfully addressed in chapter 12, section 12.3.5.8 of ICAO PANS-ATM		

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP_1-2	Crosscheck between controllers shall be performed	Procedures to reinforce cross check to be detailed in the guidance provided to States in the RVSM ATC Operations Manual provided to States	It is shown to have been successfully addressed in the PANS-ATM		
ATSP_1-3	ATS Transfer procedures (including read back and RVSM/Non RVSM status) shall be defined in LoA	ATS transfer procedures including read back to be contained in the guidance provided to States in the LoA Template	It is shown to have been successfully addressed in AFI LoA/P Template	The requirements placed on States to coordinate ATS procedures with adjacent ACC's and to develop/amend Letter of Agreement/Procedures (LoA/P) in compliance with the AFI LoA/P template.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	ATS Coordination procedures shall be defined in the Civil – Military LoA	Design of guidance on civil-military coordination	It is shown to have been successfully addressed in Part 2 Section 1, chapter 2 of ICAO Doc 9426	The APIRG Conclusion 15/52 and the issuance of a dedicated State letter addressing civil-military coordination seminars and attendance by military ATS trainers.	It is shown to have been successfully addressed by the State letter

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
				The requirement placed on States to form a coordinating committee with State-aircraft authorities to ensure high standards of cooperation and coordination	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
				The provision by States of details of planned seminars and record of proceedings (program, outcome...)	State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_1-4	ATS Procedures regarding knowledge of RVSM status shall be defined	Appropriate procedures and R/T phraseology for knowledge of RVSM status to be detailed in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030. Phraseology examples are contained in section 6.0 of the ATC Manual for RVSM Operations	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030 and the RVSM ATC operations manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP_1-5	Climbing/descent rate shall be limited during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min)	Appropriate procedures for limitation of climbing/descent rate during level change, to be contained in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_1-6	Air/Ground Communications system maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement	Maintenance procedures requiring an Air/Ground communications system recovery in MTTR defined in Service Level Agreement, to be detailed in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the ATC Manual for RVSM Operations	The requirement placed on State to develop ACC operations manual in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_1-7	Ground/Ground Communication system maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement	Maintenance procedures requiring a Ground/Ground communications system recovery in MTTR defined in Service Level Agreement, to be detailed in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the ATC Manual for RVSM Operations	The requirement placed on State to develop ACC operations manual in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP_1-8	FDPS/RDPS/ ADS system maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement. (ENV 1 and 3)	FDPS/RDPS/ADS maintenance procedures requiring a system recovery in MTTR defined in Service Level Agreement, to be detailed in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the ATC Manual for RVSM Operations	The requirement placed on State to develop ACC operations manual in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	FDPS maintenance procedures shall be defined to ensure a communication system recovery in MTTR defined in Service Level Agreement. (ENV 2 and 4)	FDPS maintenance procedures requiring a system recovery in MTTR defined in Service Level Agreement, to be detailed in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the ATC Manual for RVSM Operations	The requirement placed on State to develop ACC operations manual in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_1-9	Weather forecast procedures shall be in place to inform ATC about areas with potential severe turbulence and/or bad weather conditions	Requirements and procedures for informing ATC about areas with severe turbulence to be detailed in the ICAO Annex 3	It is shown to have been successfully addressed in ICAO Annex 3.	Not applicable to RVSM. Already implemented as part of CVSM	-

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP_1-10	Appropriate separation standards shall be specified with regards to wake turbulences	Separation standards with regards to wake turbulence, to be detailed in ICAO 7030	It is shown to have been successfully addressed in ICAO Doc 7030.	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2	**ATS Contingency Procedures**				
ATSP2	Revised contingency procedures shall be defined.	Revised contingency procedures to be contained ICAO 7030.	It is shown to have been successfully addressed in ICAO Doc 7030	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-1	ATS Procedures to suspend RVSM shall be defined	Contingency procedures for suspending RVSM operations in the event of severe turbulence and when aircraft capability(ies) to maintain flight level(s) are impacted, to be contained in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP_2-2	ATS Procedures to coordinate RVSM suspension with adjacent ACC's shall be defined	Contingency procedures for coordinating RVSM suspension with adjacent ACC's, to be detailed in ICAO 7030 and in the LoA template.	It is shown to have been successfully addressed in ICAO Doc 7030 and in section **6.4** of the AFI LoA/P Template.	The requirement placed on State to develop ACC operations manual in compliance with ICAO 7030 and the RVSM ATC Operations Manual, and to develop/amend Letter of Agreement/Procedures (LoA/P) in compliance with the AFI LoA/P template.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-3	ATS Contingency Procedures shall be defined to provide 2000 feet separation for non RVSM civil aircraft	Contingency procedures to provide immediately 2000 feet separation to non RVSM civil-aircraft operating in the FL band 290-410	It is shown to have been successfully addressed in ICAO Doc 7030 **and in** the ATC Manual for RVSM Operations.	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-4	ATS Contingency Procedures shall be defined to exit non RVSM civil aircraft from RVSM Airspace	Contingency procedures to clear out any non RVSM civil aircraft from RVSM airspace when it is possible to do so, to be contained in ICAO 7030.	It is shown to have been successfully addressed in ICAO Doc 7030**.** Additional details are contained in the ATC Manual for RVSM Operations	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP_2-5	ATS Contingency Procedures shall be defined to execute lateral/level deviation from RVSM level	Contingency procedures to obtain (when RVSM status of civil a/c is downgraded or when a non RVSM civil a/c transiting through the airspace levelling off) ATC clearance whenever possible / to inform ATC, prior the initiation of any lateral/level deviation from RVSM level, to be contained in ICAO 7030.	It is shown to have been successfully addressed in ICAO Doc 7030**.** Additional details are contained in the ATC Manual for RVSM Operations.	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030 and the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-6	ATS Radio Communications Failure procedures shall be defined	Contingency procedures for handling loss of R/T communications, to be contained in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030**.** Additional details are contained in section 8.1 of the ATC Manual for RVSM Operations	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-7	ATS Procedures to revert to procedural control shall be specified (due to RDPS/ADS system failure) (ENV 1 et 3)	Appropriate procedures for reverting to procedural control due to RDPS/ADS system failure to be contained in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the ATC Manual for RVSM Operations	The requirements placed on States to amend their ACC operations manual to be consistent with the RVSM ATC Operations Manual.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
	ATS Procedures to revert to procedural control shall be specified (due FDPS / RDPS/ADS system failure) (ENV 1 et 3)	Appropriate procedures for reverting to procedural control due to FDPSRDPS/ADS system failure to be contained in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the ATC Manual for RVSM Operations	The requirements placed on States to amend their ACC operations manual to be consistent with the RVSM ATC Operations Manual.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-8	ATS Procedures regarding Non-receipt of flight plan shall be defined	Appropriate procedures regarding non-receipt of flight plan to be provided in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the ATC Manual for RVSM Operations	The requirements placed on States to amend their ACC operations manual to be consistent with the RVSM ATC Operations Manual.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-9	ATS Contingency procedures regarding not forecast severe turbulence shall be defined	Contingency procedures for handling unexpectedly encountered turbulence (affecting the capability to maintain the assigned flight level), to be contained in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-10	ATS Contingency procedures regarding wake turbulence shall be defined	Contingency procedures for handling encountered wake turbulence (affecting the capability to maintain the assigned flight level), to be contained in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSP_2-11	ATS Contingency procedures for Non-RVSM aircraft facing severe icing or turbulence shall be defined	Contingency procedures for handling non-RVSM civil aircraft facing severe icing and turbulence (affecting the capability for ATC to clear aircraft at flight level below FL290), to be contained in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-12	Emergency contingencies shall be specified	Contingency procedures for handling aircraft contingencies, to be contained in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_2-13	ATC Transfer procedures shall be defined in the LoA (including communication failure contingencies)	Contingency procedures for handling ground-ground communication failure, to be contained in AFI LoA Template provided to States	It is shown to have been successfully addressed in the AFI LoA Template.	The requirements placed on States to coordinate ATS procedures with adjacent ACC's and to develop/amend Letter of Agreement/Procedures (LoA/P) in compliance with the AFI LoA/P template	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	Military – Civil coordination Contingency procedures shall be defined in the civil-military LoA	Design of guidance on civil-military coordination	It is shown to have been successfully addressed in Part 2 Section 1, chapter 2 of ICAO Doc 9426	The APIRG Conclusion 15/52 and the issuance of a dedicated State letter addressing civil-military coordination seminars and attendance by military ATS trainers.	It is shown to have been successfully addressed by the State letter

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
				The requirement placed on States to form a coordinating committee with State-aircraft authorities to ensure high standards of cooperation and coordination	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
				The provision by States of details of planned seminars and record of proceedings (program, outcome...)	State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSP_3	**ATS transiting procedures**				
ATSP3	Procedures facilitating the transit of non-RVSM civil aircraft through the RVSM airspace without intermediate stops shall be defined	Contingency procedures for handling aircraft contingencies, to be contained in ICAO 7030	It is shown to have been successfully addressed in the ICAO Doc 7030	The requirements placed on States to amend their ACC operations manual to be consistent with the ICAO 7030.	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_1	**ATS Training for Normal Procedures**				

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST1a	Controllers shall be trained appropriately regarding revised clearance procedures	Training session on RVSM general procedures, to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section 5 of AFI RVSM Training Guidance Material	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section 3 of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST1b	Controllers shall be trained appropriately regarding ATS procedures for RVSM operations	Training session on RVSM general procedures, to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section 5 of AFI RVSM Training Guidance Material	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section 3 of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_1-1	Controllers shall be trained appropriately regarding knowledge of RVSM status procedures	Training session on RVSM status procedures, to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section 4 of AFI RVSM Training Guidance Material	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section 3 of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_1-2	Controllers shall be trained appropriately with regards to RVSM Procedures including correct use of FLAS	Training session on correct use of FLAS, to be contained in the AFI RVSM Training Guidance Material provided to the States.	It is shown to have been successfully addressed in sections 5 and 7 of AFI RVSM Training Guidance Material	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the CVSM airspace	It is shown to have been successfully addressed in the section 3 of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_1-3	Controllers shall be trained appropriately with regards to RVSM Procedures including read back for clearance (ENV 1 and 3)	Training session on correct use of R/T phraseology (including read back for clearance), to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in sections **6** and **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	Controllers shall be trained appropriately with regards to RVSM Procedures including read back for report leaving/reaching (ENV 2 et 4)	Training session on correct use of R/T phraseology (including read back for report leaving/reaching level), to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in sections **6** and **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_1-4	Controllers shall be trained appropriately with regards to RVSM Coordination Procedures	Training session on RVSM coordination procedures , to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in sections **5** and **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_1-5	Controllers shall be trained appropriately with regards to RVSM civil - military Coordination Procedures	Training session on RVSM civil-military coordination procedures , to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section **5** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	Military controllers shall be trained appropriately with regards to RVSM Coordination Procedures	Design of guidance on civil-military coordination	It is shown to have been successfully addressed in Part **2** Section **1**, chapter 2 of ICAO Doc 9426.	The APIRG Conclusion 15/52 and the issuance of a dedicated State letter addressing civil-military coordination seminars	It is shown to have been successfully addressed by the State letter n° **XX**
				The requirement placed on States to form a coordinating committee with State-aircraft authorities to ensure high standards of cooperation and coordination	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
				The provision by States of details of planned seminars and record of proceedings (attendance by military trainers, program, outcome…)	State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_1-6	Controllers shall be trained appropriately with regards to transfer procedures	Training session on RVSM transfer procedures, to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in sections **5** and **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_1-7	Controllers shall be trained on limitation of Climbing/descent rate during the level change to avoid nuisance RA (e.g.500ft/min to 1000ft/min)	Training session on transition of non RVSM civil aircraft transiting through the RVSM airspace, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_1-8	Air/Ground Communications Maintenance team shall be trained appropriately with regards to Air/Ground Communication system maintenance procedures	Training session for technical staff on Air/Ground communications system recovery to be required in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual.	The requirements placed on States to manage and mitigate all RVSM identified risks	It is shown to have been successfully addressed in the sub-sections **n.7** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
	Maintenance team shall be trained appropriately with regards to Ground/Ground Communication system maintenance procedures	Training session for technical staff on Air/Ground communications system recovery to be required in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual.	The requirements placed on States to manage and mitigate all RVSM identified risks	It is shown to have been successfully addressed in the sub-sections **n.7** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_1-8	Maintenance team shall be trained appropriately with regards to RDPS/FDPS/ADS systems maintenance procedures (ENV 1 and 3)	Training session for technical staff on FDPS/RDSPS/ADS system recovery to be required in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual.	The requirements placed on States to manage and mitigate all RVSM identified risks	It is shown to have been successfully addressed in the sub-sections **n.7** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	Maintenance team shall be trained appropriately with regards to FDPS systems maintenance procedures (ENV 1 and 2)	Training session for technical staff on FDPS system recovery to be required in the guidance provided to States in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual.	The requirements placed on States to manage and mitigate all RVSM identified risks	It is shown to have been successfully addressed in the sub-sections **n.7** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_1-9	Controllers shall be trained appropriately regarding appropriate separation standards related to wake turbulence	Training session on application of appropriate separation standards with regards to wake turbulence, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section 7 of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section 3 of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_2	**ATS Training for Contingency Procedures**				
ATST2	Controllers shall be trained appropriately with regards to RVSM contingencies	Training session on RVSM contingency procedures, to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section 5 of AFI RVSM Training Guidance Material	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section 3 of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_2-1	Controllers shall be trained appropriately regarding suspension of RVSM (including coordination with adjacent ACC's)	Training session on RVSM suspension and coordination with adjacent ACC, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section 3 of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_2-2	Controllers shall be trained appropriately with regards to contingency procedures in case of MASPS requirements failure	Training session on degradation of aircraft performance, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_2-3	Controllers shall be trained appropriately with regards to ATS/DS failure contingency procedures	Training session on ATS/DS failure contingency, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_2-4	Controllers shall be trained appropriately with regards to Radio Communications Failure procedures	Training session on RCF procedures, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in sections **5** and **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_2-5	Controllers shall be trained appropriately to revert to procedural control in case of RDPS/ADS system failure (ENV 1 and 3)	Training session on reversion to procedural control, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_2-6	Controller shall be trained appropriately to operate without FDPS system (blank strip,…)	Training session on operations without FDPS system, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_2-7	Controllers shall be trained appropriately regarding Non-receipt of flight plan procedures	Training session on operations without receipt of flight plan, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_2-8	Controllers shall be trained appropriately with regards to coordination Contingency procedures (including Military coordination)	Training session on coordination (civil and military) contingencies (for handling ground-ground communications failure), to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	Military Controllers shall be trained appropriately with regards to coordination Contingency procedures	Design of guidance on civil-military coordination	It is shown to have been successfully addressed in **Part 2 Section 1, chapter 2 of ICAO Doc 9426.**	The APIRG Conclusion 15/52 and the issuance of a dedicated State letter addressing civil-military coordination seminars	It is shown to have been successfully addressed by the State letter
				The requirement placed on States to form a coordinating committee with State-aircraft authorities to ensure high standards of cooperation and coordination	It is shown to have been successfully addressed in the section **5** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
				The provision by States of details of planned seminars and record of proceedings (attendance by military trainers, program, outcome…)	State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_2-9	Controllers shall be trained appropriately regarding contingency procedures related to not forecast turbulence	Training session on contingencies for handling encountered turbulence, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	ATC controller shall be trained appropriately regarding contingency procedures related to Non-RVSM aircraft facing severe icing or turbulence	Training session on contingencies for non RVSM civil aircraft facing severe icing and turbulence (affecting the capability for ATC to clear aircraft below (FL290), to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	Controllers shall be trained appropriately regarding contingency procedures related to wake turbulence	Training session on contingencies for handling encountered wake turbulence, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section **7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATST_2-10	Controllers shall be trained appropriately with regards to emergency contingencies	Training session on handling of aircraft emergencies, to be detailed in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in section **5 and 7** of AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATST_3	**ATS Training for Transiting Procedures**				
ATST3	Controllers shall be trained appropriately with regards to Non-RVSM civil aircraft transiting procedures (including contingencies)	Training session on transiting procedures (including contingencies) for non-RVSM civil aircraft, to be contained in the AFI RVSM Training Guidance Material provided to the States	It is shown to have been successfully addressed in AFI RVSM Training Guidance Material.	The requirements placed on States to provide training, making full use of the approved training material, to all controllers who will have operational responsibility in the RVSM airspace	It is shown to have been successfully addressed in the section **3** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSE_1	**ATS Equipment**				
ATSE1	ATS equipment shall be modified to indicate and display RVSM status	Specific requirement to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in section **9.2** of RVSM ATC Operations Manual	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSE2	Existing conflict detection/alerting capabilities shall be updated to be consistent with RVSM operations	Specific requirement to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in section **9.5** of RVSM ATC Operations Manual	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSE_1-1	Air/Ground Communication system shall be designed to ensure a total coverage of the RVSM airspace with a minimum MTBF of 2 months for a given FIR	Specific requirement to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	ATS/DS Communications system shall be designed to ensure point-to-point between all adjacent ACC's with a minimum MTBF of 2 months for a given Radar / ADS FIR (ENV 1 and 3)	Specific requirement to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
	ATS/DS Communication system shall be designed to ensure point-to-point communications between all adjacent ACC's with a minimum MTBF of 60 years for a given non Radar / ADS FIR (ENV 2 and 4)	Specific requirement to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSE_1-2	RVSM/Non RVSM Status shall be provided by transferring controller (including when status is downgraded)	Specific requirement on the display to the controller, during coordination (data), of the RVSM status of the entering aircraft, to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in section **9.4** of RVSM ATC Operations Manual.	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
ATSE_1-3	Suitable and reliable ground communications means shall be implemented	Specific requirement on the suitability and reliability of communications equipment, to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual.	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
ATSE_1-4	Weather forecast equipment shall be in place to inform ATC about areas with severe turbulence	Requirement on weather forecast equipment about severe turbulence function, to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual.	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
	Weather forecast equipment shall be in place to inform ATC about bad weather conditions	Requirement on weather forecast equipment about bad weather conditions function, to be included in the RVSM ATC Operations Manual	It is shown to have been successfully addressed in RVSM ATC Operations Manual.	The requirement placed on State to provide changes to ATS Equipment in compliance with the RVSM ATC Operations Manual	It is shown to have been successfully addressed in the section **4** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
AD	**Airspace Design**				
AD_1	An appropriate Flight Level Orientation Scheme shall be developed	Review suitability of FLOS and/or FLAS, route network , sectorisation and adapt as required	It is shown to have been successfully addressed in Appendix **3** of the ICAO Annex 2. Review for AFI Region documented in ARTF report.	The guidance and support provided to States through the AFI RVSM ATC Operations Manual and the requirement placed on States to use the Manual as guidance material	It is shown to have been successfully addressed in the section **6** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
AD_2	Airspace facilities for emergency situations shall be provided	Review suitability of emergency procedures contained in AFI RVSM ATC Operations Manual and design airspace as required	It is shown in AFI RVSM TF report that no additional changes to AFI RVSM airspace design are necessary.	Not applicable	Not applicable
SM	**System Monitoring**				
SM1	The exclusion of non-RVSM approved non-State aircraft from AFI RVSM airspace shall be monitored	Establish an RMA. Develop and maintain RVSM approvals data base. Cross-check flight plan approval status against data base	It is shown to have been successfully addressed through the guidance material provided in the AFI RMA Manual (section **2**).	The requirement on States to provide the RMA with up to date information on the RVSM approval status of aircraft/operators for whom they have responsibility as set out in the AFI RVSM Manual and the AFI RMA Manual	It is shown to have been successfully addressed in the section **8** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
SM2	The height-keeping performance of RVSM-approved aircraft shall be monitored	Establish an RMA. Develop an AFI RVSM Monitoring Policy. Collect height monitoring data Estimate technical vertical risk	It is shown to have been successfully addressed through the guidance material provided in the AFI RMA Manual (section **2**) and the CRA report (section **3**).	Not applicable	Not applicable

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
SM3	Data on operational errors shall be collected for collision risk estimation	Establish an RMA. Collect data on operational errors Estimate total vertical risk	It is shown to have been successfully addressed through the guidance material provided in the AFI RMA Manual (section **2**) and the CRA report (section **4**).	The requirement placed on States to provide data on operational errors as set out in the AFI RMA manual and ICAO State Letter and in the NSP guidance material	It is shown to have been successfully addressed by the State letter **and** in the section **8** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
SM4	Data on risk exposure shall be collected for collision risk estimation	Establish an RMA. Collect data on traffic flows and navigation performance Estimate total vertical risk	It is shown to have been successfully addressed through the guidance material provided in the AFI RMA Manual (section **2**) and the CRA report (section 3).	The requirement on States to provide data on traffic flows and navigation performance as set out in the AFI RMA manual and ICAO State Letter and in the NSP guidance material	It is shown to have been successfully addressed by the State letter **and** in the section **8** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
SM5	Data on ACAS/TCAS events shall be collected and evaluated	Establish an RMA. Collect data on ACAS/TCAS events Estimate total vertical risk	It is shown to have been successfully addressed in section 14.**3** of ICAO 7030, in section **2** of the AFI RMA manual and in section **4** of the CRA report.	The requirement on States to provide data on ACAS/TCAS events as set out in ICAO Doc 7030 and the AFI RMA Manual (and also covered by ICAO State letter and in the NSP guidance material	It is shown to have been successfully addressed by the State letter **and** in the section **8** of the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported in section 5.3.
RVSM	**Overall System**				
RVSM5	The probability of any system failure leading to a mid-air collision shall be sufficiently low for the risk of mid-air collision due to the loss of vertical separation from all causes in AFI RVSM airspace to meet a TLS of 5×10^{-9} fatal accidents per flight hour.	Establish and RMA Estimate total vertical risk	CRA report	Not applicable	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level	
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Result**
RVSM6	The system shall be sufficiently reliable for the number of ATM-induced accidents and serious or risk-bearing incidents in AFI RVSM airspace not to increase from current CVSM levels and, where, possible to decrease.	Establish and RMA Estimate total vertical risk	CRA report	Not applicable	

Table **7** : Realisation of System Element Requirements (AFI RVSM Core Airspace)

D.3 AFI RVSM Switch-over Period

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
FCOP_1	**Flight Crew and Operator Normal Procedures**					
S_FCOP_1-1	A NOTAM shall be issued for the activation of the new FLAS during the switch-over period	Detailed switch-over plan prepared by ICAO and provided to States for dissemination to operators through State IAIP (Integrated Aeronautical Information Package). This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. The requirements placed on States through State letter to disseminate it to operators through IAIP. States are required to acknowledge receipt of the State letter	It is shown to have been successfully addressed in the the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans.	
		Detailed flight crew switchover bulletin	It is shown to have been successfully addressed in the flight crew switchover bulletin.	The dissemination of the flight crew bulletin by IFALPA	**Can only be done after approval**	
		Awareness workshop for operators, by ICAO/TF, to be facilitated by States and the inclusion in the switch-over plan of the requirement to organise such workshops	It is shown that the requirement is stated in the AFI RVSM Switch-over plan and that this requirement has been successfully addressed by the ICAO Guidance Material for the facilitation of workshops with operators	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. The requirements placed on States through State letter to disseminate it to operators through IAIP. States are required to acknowledge receipt of the State letter	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_FCOP_1-2	Flight Crew Switch-over Procedures shall be in place to impose the read back for level clearance during the switch-over period	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed in SWOP	
S_FCOP_1-3	Flight Crew Switch-over Procedures shall be in place to impose the surveillance of the level change during the switch-over period	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed in SWOP	
S_FCOP_1-4	Use of Eastbound RVSM FL (FL310, FL350 and FL390) shall be suspended for a period of 02 hours after the T0.	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed in SWOP	
S_FCOP_1-5	A NOTAM shall be produced to suspend FL310, FL350 and FL390 for RVSM operations after ToS during a period of 02 hours	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed in SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_FCOP_1-6	Transit of non-RVSM civil a/c shall be suspended for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed SWOP	
S_FCOP_1-7	Operation above FL410 shall be suspended for non-RVSM a/c for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed in SWOP	
S_FCOP_1-8	The traffic flow management capabilities shall be available before the switch-over period	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1 approach related to SWOP addressed in section 4.4 of SWOP,	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed in SWOP	
FCOP_2	**Flight Crew and Operator Planning Procedures**					
S_FCOP_2-1	Level change and time/point for non RVSM civil aircraft to leave the FL band 410 and above-410 before ToS shall be indicated in the flight plan	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_FCOP_2-2	Level change and time/point for non RVSM civil aircraft to leave the FL band 290-410 before ToS shall be indicated in the flight plan	The realisation of this requirement is a specific aspect of the development of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of flight crew and operator switch-over procedures is detailed in SWOP	
FCOT_1	**Flight Crew and Operator Training for Normal Procedures**					
S_FCOT_1-1	Awareness campaigns about RVSM Status shall be organized before the switch-over period	Detailed switch-over plan prepared by ICAO and provided to States for dissemination to operators through State IAIP (Integrated Aeronautical Information Package).	It is shown to have been successfully addressed in the AFI RVSM switch-over plan (or its amendment?).	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. The requirements placed on States through State letter to disseminate it to operators through IAIP. States are required to acknowledge receipt of the State letter	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
		Detailed flight crew switchover bulletin	It is shown to have been successfully addressed in the flight crew switchover bulletin.	The dissemination of the flight crew bulletin by IFALPA	**Will be done after approval**	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
		Awareness workshop for operators, by ICAO/TF, to be facilitated by States and the inclusion in the switch-over plan of the requirement to organise such workshops	It is shown that the requirement is stated in the AFI RVSM Switch-over plan (or its amendment?) and that this requirement has been successfully addressed by the ICAO Guidance Material for the facilitation of workshops with operators	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. The requirements placed on States through State letter to disseminate it to operators through IAIP. States are required to acknowledge receipt of the State letter	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_FCOT_1-2	Flight crew shall be trained appropriately with regards to RVSM procedures before Switch-over period	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	
S_FCOT_1-3	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new FLAS (after completion of training for all staff)	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_FCOT_1-4	Flight crew shall be trained appropriately with regards to switch-over procedures(read back for level clearance)	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	
S_FCOT_1-5	Flight crew shall be trained appropriately with regards to switch-over procedures related Report reaching level	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	
S_FCOT_1-6	Awareness campaigns shall be organized before the switch-over period to reinforce the importance of read back	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	
S_FCOT_1-7	Flight Crew shall be briefed on the suspension of Eastbound RVSM FL (Fl310, FL350 and FL390) for a period of 02 hours after the T0.	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_FCOT_1-8	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new FLAS for operators	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	
S_FCOT_1-9	Flight Crew shall be briefed on the suspension of transit of non-RVSM civil a/c for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	
S_FCOT_1-10	Flight Crew shall be briefed on the suspension of operations above FL410 for non-RVSM a/c for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the flight crew and operator awareness campaign for the switch-over period and is covered by S_FCOT_1-1.	See S_FCOP_1-1	The realisation of this requirement is a specific aspect of the implementation of the flight crew and operator switch-over procedures and is covered by S_FCOP_1-1.	The implementation of the flight crew and operator awareness campaign for switch-over is detailed in SWOP	
ATSP_1	**ATS Normal Procedures**					

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSP_1-1	ATC shall verify the RVSM status of each aircraft within its area of responsibility before the ToS	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in section **2.3** of the AFI RVSM switch-over plan.	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans	
		Detailed controller switchover bulletin	It is shown to have been successfully addressed in the controller switchover bulletin.	The dissemination by ARPO and the issuance of a dedicated State letter.	**State letter**	
S_ATSP_1-2	ATC team shall be reinforced during the switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-3	Switch-over Procedures shall be in place to impose the surveillance of the execution of the level clearance during the switch-over period (ENV 1 and 2)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSP_1-4	A NOTAM shall be issued for the activation of the new FLAS during the switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-5	Switch-over Procedures shall be in place to impose the read back for level clearance during the switch-over period (ENV 1 and 2)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-6	Switch-over Procedures shall be in place to recover from incorrect clearance issue (ENV 1 and 2)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-7	Switch-over Procedures shall be in place to impose the surveillance of the execution of the level information during the switch-over period (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-8	Switch-over Procedures shall be in place to impose the surveillance of the level change during the switch-over period (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSP_1-9	Switch-over Procedures shall be in place to recover from incorrect information issue (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-10	Use of Eastbound RVSM FL (Fl310, FL350 and FL390) shall be suspended for a period of 02 hours after the T0.	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-11	A NOTAM shall be produced to suspend FL310, FL350 and FL390 for RVSM operations after ToS during a period of 02 hours	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-12	Switch-over Procedures shall be in place to ensure the delivery of relevant level clearance for non RVSM civil aircraft to leave the FL band 290-410 before ToS (ENV 1 and 2)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-13	Switch-over Procedures shall be in place to ensure the delivery of relevant level information for non RVSM civil aircraft to leave the FL band 290-410 before ToS (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSP_1-14	Transit of non-RVSM civil a/c shall be suspended for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-15	Operation above FL410 shall be suspended for non-RVSM a/c for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-16	The traffic flow management capabilities shall be available before the switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-17	Modification to existing reliable communication systems (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSP_1-18	Maintenance staff shall be reinforced during switch over period	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-19	Flight plan shall be checked for non RVSM civil aircraft to leave the FL band 410 and above before ToS (Level change and time/point) (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-20	Flight plan shall be checked for non RVSM civil aircraft to leave the FL band 290-410 before ToS (Level change and time/point) (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-21	LoAs and Procedures shall be in place before Switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin.	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_1-22	Civil/Military coordination procedures shall be in place before Switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSP_1-23	Switch-over Procedures shall be in place to ensure the delivery of relevant level information for non RVSM civil aircraft to leave the FL band 290-410 before ToS (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
ATSP_2	**ATS Contingency Procedures**					
S_ATSP_2-1	RDPS/ADS system failure contingencies shall be defined before the switch over period	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_2-2	HMI failure contingencies shall be defined before the switch over period (ENV 1 and 3)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
S_ATSP_2-3	FDPS failure contingencies shall be defined before the switch over period (ENV 1 and 3)	The realisation of this requirement is a specific aspect of the development of the ATS switch-over procedures and is covered by S_ATSP_1-1.	It is shown to have been successfully addressed in of the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS switch-over procedures and is covered by S_ATSP_1-1.	The implementation of the ATS switch-over procedures SWOP	
ATST_1	**ATS Training for Normal Procedures**					

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATST_1-1	Awareness campaigns about RVSM Status shall be organized before the switch-over period	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
		Detailed controller switchover bulletin	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The dissemination by ARPO and the issuance of a dedicated State letter.	**State letter**	
S_ATST_1-2	Controllers shall be trained with regards to the verification of the RVSM status of each aircraft within its area of responsibility before the ToS	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-3	Controllers shall be trained appropriately with regards to RVSM procedures before Switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATST_1-4	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new FLAS (after completion of training for all staff)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-5	Controller shall be trained appropriately with regards to switch-over procedures (surveillance of the execution of the level clearance)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-6	Controller shall be trained appropriately with regards to switch-over procedures (read back for level clearance) (ENV 1 and 2)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-7	Controller shall be trained appropriately with regards to switch-over procedures (recovering from incorrect clearance issue) (ENV 1 and 2)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-8	Controller shall be trained appropriately with regards to switch-over procedures (surveillance of the execution of the level information) (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATST_1-9	Controller shall be trained appropriately with regards to switch-over procedures related to the level change (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-10	Controller shall be trained appropriately with regards to switch-over procedures (recovering from incorrect information issue) (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-11	Controller shall be briefed on the suspension of Eastbound RVSM FL (Fl310, FL350 and FL390) for a period of 02 hours after the T0.	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-12	Controllers shall be trained appropriately with regards to broadcast the switch-over countdown : ToS - 60mn, 45mn, 30mn,15mn , ToS-5mn and ToS	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-13	Controllers shall be trained appropriately with regards to deliver relevant level clearance for non RVSM civil aircraft to leave the FL band 290-410 before ToS (ENV 1 and 2)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATST_1-14	Controllers shall be trained appropriately with regards to deliver relevant level information for non RVSM civil aircraft to leave the FL band 290-410 before ToS (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-15	Controller shall be briefed on the suspension of transit of non-RVSM civil a/c for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-16	Controllers shall be briefed on the suspension of operations above FL410 for non-RVSM a/c for a period of 02 hours after T0	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-17	Controllers shall be trained with regards to the checking of flight plan for non RVSM civil aircraft to leave the FL band 290-410 before ToS (Level change and time/point) (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-18	Controllers shall be trained with regards to the checking of flight plan for non RVSM civil aircraft to leave the FL band 290-410 and above before ToS (Level change and time/point) (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATST_1-19	Controller shall be trained appropriately with regards to the checking into the flight plan that FL310, FL350 and FL390 are not intended to be used after ToS (ENV 3 and 4)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-20	ATS technical staff shall be aware that modification to existing reliable FDPS (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-21	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new LOA	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-22	Controller shall be trained appropriately with regards to LoAs and procedures before Switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in f the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-23	Controller shall be trained appropriately with regards Civil/Military coordination procedures before Switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATST_1-24	Military Controller shall be trained appropriately with regards Civil/Military coordination procedures before Switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-25	Awareness campaigns shall be organized before the switch-over period to reinforce the knowledge of the new Civil/Military coordination procedures	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-26	Maintenance staff shall be trained appropriately with regards to modified systems before Switch-over period	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATST_1-27	ATS technical staff shall be aware that modification to existing reliable HMI (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed (ENV 1 and 3)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATST_1-28	ATS technical staff shall be aware that modification to existing reliable RDPS/ADS system (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed (ENV 1 and 3)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
ATST_2	**ATS Training for Contingency Procedures**					
S_ATSP_2-1	Maintenance staff shall be trained with regards to RDPS/ADS system failure contingencies before the switch over period (ENV 1 and 3)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATSP_2-2	Maintenance staff shall be trained with regards to FDPS failure contingencies before the switch over period	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
S_ATSP_2-3	Maintenance staff shall be trained with regards to HMI failure contingencies before the switch over period (ENV 1 and 3)	The realisation of this requirement is a specific aspect of the development of the ATS training for switch-over and is covered by S_ATST_1-1.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan and in the controller switchover bulletin	The realisation of this requirement is a specific aspect of the implementation of the ATS training for switch-over and is covered by S_ATST_1-1.	The implementation of ATS training for switch-over is detailed in Trg material	
ATSE_1	**ATS Equipment**					

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSE_1-1	Upgraded ground system shall be in place to manage the RVSM status information before the switch-over period	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_ATSE_1-2	ATS Equipment shall enable controller to check flight plan for non RVSM civil aircraft to leave the FL band 290-410 before ToS (Level change and time/point) (ENV 3 and 4)	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSE_1-3	The traffic flow management capabilities shall be available before the switch-over period	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_ATSE_1-4	SAT Phone and/or PSTN shall be available for point to point communications during the switch over period	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSE_1-5	Modification to existing reliable communication systems (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_ATSE_1-6	Modification to existing reliable HMI (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed (ENV 1 and 3)	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSE_1-7	Modification to existing reliable RDPS/ADS system (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed (ENV 1 and 3)	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_ATSE_1-8	Modification to existing reliable FDPS (and related procedures) which compromise reliability prior to switch over and during switch over period shall not be performed	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_ATSE_1-9	ATS equipment shall enable controller to check flight plan for non RVSM civil aircraft to leave the FL band 410 and above before ToS (Level change and time/point) (ENV 3 and 4)	Detailed switch-over plan prepared by ICAO and provided to States. This plan is to provide mitigations for all the switch-over hazards.	It is shown to have been successfully addressed in the AFI RVSM switch-over plan	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
RVSM	**Overall System**					
S_RVSM1	The switch-over period shall be performed during an appropriate low traffic density period	Design of the switchover period and time by the ICAO/TF and of a detailed switch-over plan by ICAO. This plan is provided to States and is to provide mitigations for all the switchover hazards	It is shown to have been successfully addressed respectively in TF/**9** report and in section **4.2** of the AFI RVSM switch-over plan.	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_RVSM2	The switch-over period shall be determine out of Hadj period	Design of the switchover period and time by the ICAO/TF and of a detailed switch-over plan by ICAO. This plan is provided to States and is to provide mitigations for all the switchover hazards	It is shown to have been successfully addressed respectively in TF/**9** report and in section **4.2** of the AFI RVSM switch-over plan.	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_RVSM3	Traffic density shall be limited during switch-over period as appropriate	Design of the switchover period and time by the ICAO/TF and of a detailed switch-over plan by ICAO. This plan is provided to States and is to provide mitigations for all the switchover hazards	It is shown to have been successfully addressed respectively in TF9 report and in section 4.2 of the AFI RVSM switch-over plan.	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	

Reference	System Element Requirement (SER)	Realisation at a Concept level (design)		Implementation level		
		Approach *the realisation is addressed by the design of…*	**Result**	**Approach** *the realisation is addressed by…*	**Realisation result**	**Status**
S_RVSM4	The FIR airspace shall be optimized to reduce controller workload	Not applicable	-	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_RVSM5	The date of switchover shall take into account the effect of adverse weather (thunderstorm, sandstorm, …) to minimize the effect on switch over operations	Design of the switchover period and time by the ICAO/TF and of a detailed switch-over plan by ICAO. This plan is provided to States and is to provide mitigations for all the switchover hazards	It is shown to have been successfully addressed respectively in TF/**9** report and in section **4.2** of the AFI RVSM switch-over plan.	The requirements placed on States through NSP to develop a national version of the AFI RVSM switch-over plan. A state letter is issued for the dissemination of the plan and States are required to acknowledge receipt.	It is shown to have been successfully addressed in the National Safety Plan template. State commitment to this realisation is contained within the National Safety Plans, reviewed and reported	
S_RVSM6	Civil/Military coordination committee shall be in place	The realisation of this requirement is not a specific aspect of switch-over and is covered by ATSP_1-5 (Core Airspace)	-			

Table **8** : Realisation of System Element Requirements (AFI RVSM Core Airspace)

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Appendix E: Airspace Design

AFI FIR's have not undergone any redesign of airspace to accommodate RVSM operations. The RVSM airspace has been and will be published periodically in applicable aeronautical documentation and will encompass all that airspace within the AFI FIR's between FL290 and FL410 inclusive.

Accra	Addis Ababa	Algiers	Antananarivo
Asmara	Beira	Brazzaville	Cairo
Canarias	Cape Town	Dakar	Dakar Oceanic
Dar es Salaam	Entebbe	Gaborone	Harare
Johannesburg	Johannesburg Oceanic	Kano	Khartoum
Kinshasa	Lilongwe	Luanda	Lusaka
Mauritius	Mogadishu	Nairobi	Ndjamena
Niamey	Roberts	Sal Oceanic	Seychelles
Tripoli	Windhoek	Tunis	Casablanca

Table 9: AFI RVSM Airspace

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Appendix F: ARMA and Monitoring

F.1 Introduction

System Element Requirement **SM2** requires that the height-keeping performance of RVSM-approved aircraft is monitored. This requirement is taken care of by the AFI Regional Monitoring Agency (ARMA). Taking ICAO guidance material into account, ARMA has been instituted with the following primary functions:

- Establish and maintain a database of RVSM-approved aircraft;
- Monitor aircraft technical height-keeping performance and the occurrence of large height deviations and report results accordingly;
- Conduct Safety and Readiness Assessments and report results accordingly;
- Monitor operator compliance with State approval requirements; and
- Initiate necessary remedial actions if RVSM requirements are not met.

This appendix summarises the results of ARMA's activities with respect to Readiness Assessment and height monitoring in sections F.2 and F.3 respectively.

F.2 Readiness assessment

Introduction

A readiness assessment is an examination of the approval status of operators and aircraft using the airspace where RVSM is planned in order to evaluate whether a sufficiently high proportion of operations will be conducted by approved operators and aircraft when RVSM is introduced (Cf. *ARMA Handbook*). It thus requires two pieces of information, namely a sample of traffic movements from the relevant airspace and a database of State RVSM approvals. Some statistics on the latter and on the readiness assessment proper are given below.

RVSM approval status of African registered aircraft/operators

ARMA has compiled a list of African registered aircraft/operators capable of RVSM operations in the flight level band FL290 – FL410 inclusive as per 31 October 2006. A summary of various numbers of aircraft per "aircraft monitoring group" is shown in the table below. Most monitoring groups are defined in the *ARMA Handbook* and in the *EUR RVSM PISC* (Cf. **Annex 1** for references details). [Open issue F.1]

Monitoring group	ICAO codes	Number of airframes	Number of approved airframes	Number of unapproved airframes
A124	A124	2		2
A300	A306, A30B	15	12	3
A310-GE	A310	7	7	
A310-PW	A310			
A320	A319, A320, A210	65	65	
A330	A332, A333	12	12	

Monitoring group	ICAO codes	Number of airframes	Number of approved airframes	Number of unapproved airframes
A340	A342, A343	16	16	
A346	A346	8	8	
AN12[4]	AN12	1		1
AN2	AN2	19		19
AN26	AN26	9		9
AN32	AN32	1		1
AN72	AN72, AN74	2		2
ATR	AT43, AT44, AT45	12	7	5
B190	B190	31	11	20
B461	B461	1	1	
B701	B701	2	2	
B703	B703	27	19	8
B727	B721, B722	83	36	47
B732	B732	60	25	35
B737CL	B733, B734, B735	36	35	1
B737NX	B736, B737, B738, B739	54	52	2
B744[5]	B744	11	10	1
B747CL	B741, B742, B743	23	17	6
B74S	B747SP	1	1	
B752	B752	9	9	
B767	B762, B763	30	28	2
B772	B772	8	8	
BA11	BA11	16	4	12
BD100	CL30	3	3	
BE20	BE20, BE30, B350	21		21
BE40	BE40			
C130	C130	65		65
C500	C500 (all except serial nr 193)	1		1
C501-1	C501			
C525	C525	1	1	
C550-B	C550 (Citation Bravo)	2		2
C550-II	C550, C551 (Citation II)	5	1	4
C550-SII	C550 (Citation Super II)			
C560	C560	7	2	5
C56X	C56X			
C750	C750	2	2	
CARJ	CRJ1, CRJ2			
CL600	CL60 (CL-600)	6	5	1
CL604	CL60 (CL-604)	1	1	
D228	D228	3	2	1
D328	D328	6		6
DC10	DC10	11	11	
DC8[6]	DC86, DC87	2		2

[4] AN12, AN2, AN26, AN32, B190, B461, C130, D228, D328, DHC6, E120, F27, F28, IL18, IL62, LJ24, LJ25, PC12, S601, SW4, YK40 are not listed as monitoring groups in references 18 and 19.
[5] B744 is split into two monitoring groups: B744-10 and B744-5 depending on the serial numbers.

Monitoring group	ICAO codes	Number of airframes	Number of approved airframes	Number of unapproved airframes
DC85	DC85	7	5	2
DC86	DC86	14	12	2
DC87	DC87	1		1
DC93	DC93	16	7	9
DC95	DC95	1	1	
DHC6	DHC6			
E120	E120	5	4	1
E135-145	E135, E145			
F100	F100	1	1	
F27	F27	1		1
F28	F28	25	12	13
F2TH	F2TH	1	1	
F70	Fokker 70	1	1	
F900	F900	8	6	2
FA10	FA10	1	1	
FA20	FA20	5	4	1
FA50	FA50	7	6	1
G159	G159	9		9
GLEX	GLEX	2	2	
GLF2	GLF2	11	6	5
GLF3	GLF3	5	3	2
GLF4	GLF4	5	3	2
GLF5	GLF5	3	3	
H25A	H25A	4		4
H25A-100	H25A (100 series)			
H25A-400	H25A (400 series)	2		2
H25A-600	H25A (600 series)	5		5
H25B-700	H25B (700 series)	7	3	4
H25B-800	H25B (800 series)	8	4	4
H25CNG	H25C	1	1	
IL18	IL18	2		2
IL62	IL62	2		2
IL76	IL76	31	2	29
J328	J328			
L101	L101	9	8	1
L29A-6	L29A (jetstar 6)	2		2
L29B-2	L29B (jetstar 2)	2	1	1
LJ24	LJ24			
LJ25	LJ25			
LJ31	LJ31	2		2
LJ35/6	LJ35, LJ36	1	1	
LJ45	LJ45	12	12	
MD11	MD11	2	2	
MD80	MD81, MD82, MD83, MD87, MD88	6	6	

[6] DC8 is not a monitoring group, but is split into DC86-7, DC86-7-1, DC86-7NG depending on the series.

Monitoring group	ICAO codes	Number of airframes	Number of approved airframes	Number of unapproved airframes
PC12	PC12	2		2
PRM1	PRM1			
S210	S210	3	1	2
S601	S601	4		4
SW4	SW4			
T134	T134	4		4
T154	T154	1		1
T204	T204, T224, T234	4	4	
YK40	YK40	18	1	17
YK42	YK42	1		1

Table **10** African registered aircraft/operators

On 31 October 2006 the following AFI RVSM aircraft readiness statistics have been derived:

- Total RVSM capable fleet 961
- Total RVSM approved 537
- AFI Aircraft RVSM Readiness Status 56%

Proportion of flights made by RVSM approved aircraft/operators

The AFI RVSM Safety Policy statement (c) states that "the implementation of RVSM shall be conducted in accordance with ICAO requirements and requires ninety percent RVSM approved aircraft within the Region". Unfortunately, the 90% part of the statement is ambiguous. In line with the definition of a readiness assessment above, it is interpreted as requiring that 90% of the pre-RVSM flights in the Region within the band FL290 – FL410 inclusive shall be made by RVSM approved aircraft. It should be remarked that this interpretation is different from the one utilized in the ***RVSM PISC*** *for the EUR Region* and which is that 90% of the flights shall be made by RVSM approved aircraft/operator combinations which have met the height monitoring targets.

The total African-registered RVSM approved aircraft population is currently making up 47% of the flights in the AFI Region in the flight level band FL290 - FL410. An additional 43% of the flights in this band in the AFI Region is made by non-African registered RVSM approved aircraft/operators. These two percentages were derived from a sample of traffic taken from the following FIR's:

- Windhoek;
- Kano;
- Antananarivo;
- Seychelles;
- Roberts; and
- Nairobi.

Thus 90% of the flights between FL290 and FL410 inclusive would be made by RVSM approved aircraft.

F.3 Height monitoring

Introduction

The discussion in this section of **Appendix F** is limited to monitoring of the technical height-keeping performance of RVSM-approved aircraft. Such monitoring requires an appropriate height monitoring infrastructure within which two different types of height monitoring systems may be distinguished (Cf. *EUR RVSM Safety Policy*),namely ground-based height monitoring units (HMUs) (utilised by AFI aircraft when conveniently routed in Europe) and portable GPS-based monitoring units (GMUs) (when so requested via the ARMA for a Height Monitoring Service in AFI).

It was realised that the use of HMUs was not feasible within the AFI region. However, as the normal technical height-keeping performance of aircraft does not depend on the ICAO Region that an aircraft is operating in, it was agreed to use height monitoring data collected by the European Regional Monitoring Agency (EUROCONTROL) for those types of aircraft that are also operating in EUR RVSM airspace. This data might be supplemented with height monitoring data collected by other Regional Monitoring Agencies. To account for aircraft types operating in AFI RVSM airspace but not in EUR RVSM airspace, ARMA has entered into a contract with ARINC to monitor those aircraft types on an individual basis by means of GMUs.

The next two sub-sections summarise the use of HMU data and of GMU data, respectively.

HMU data

The height-keeping performance of RVSM-approved aircraft is measured in the form of Total Vertical Error (TVE) and its two components Altimetry System Error (ASE) and Assigned Altitude Deviation (AAD) on the assumption that correspondence error is negligible. The height monitoring data is used for verification of the MASPS and for the estimation of the probability of vertical overlap due to normal technical height deviations of RVSM approved aircraft. This probability is the main parameter of the collision risk model for the technical vertical risk in AFI RVSM airspace. Estimating this probability requires extensive modelling of the height monitoring data by means of appropriate probability distributions, see e.g. the *CRA reports* (Cf. **Annex 1**). It should be noted that when GMU height monitoring data is available, it will be used in conjunction with the more numerous HMU data in the various analyses.

As mentioned above, it was agreed to use height monitoring data from the European height monitoring programme for as many aircraft monitoring groups as possible. Recall that an aircraft monitoring group consists of those aircraft that are of nominally identical design and build with respect to all details that could influence the accuracy of height keeping performance. A monitoring group can consist of several aircraft types with different ICAO codes, but an aircraft type characterised by a single ICAO code can also be in more than one monitoring group.

A total of 98 monitoring groups were identified for the AFI Region in the first *AFI RVSM CRA report*. Height monitoring data was used as available from the European height monitoring programme for all but the following monitoring groups: F28, BA11, B190, F50, PC12, C130, ATR, YK40, DH8 and G159. For the latter monitoring groups, a default Gaussian ASE probability distribution has been assumed with mean zero and a standard deviation of 81.7 ft based on the MASPS (Cf. *ARMA Handbook*). AAD was modelled

for all monitoring groups by means of a Double Exponential probability distribution with a standard deviation of 39.8 ft.

Since verification of the MASPS and height monitoring targets for the various monitoring groups is performed as a part of the EUR Annual Safety Monitoring Report, such verification was not necessary in the context of AFI RVSM.

GMU data

To be able to obtain height monitoring data on African registered operators operating only inside the AFI Region, ARMA has a contract with ARINC for the benefit of height monitoring by means of GMUs. Test mission with aircraft have been flown in May 2006. The onboard data recorded was analysed and it was concluded that the GMU performed in accordance with the specification. Therefore, ARMA is now in a position to offer this height monitoring service to any operator on request.

Subsequent to the test mission ARMA has successfully monitored a number of aircraft via the GMU method which is now fully operational and is being used for the AFI height monitoring program.

Appendix G: Collision Risk Assessment

G.1 Introduction

This appendix provides a summary of the results of the first collision risk assessment for AFI RVSM. Full details of the results and the applied methodology can be found in the first *AFI RVSM CRA report* (Cf. **Annex 1**).

The collision risk assessment comprised two parts in order to verify whether both the technical vertical collision risk and the total vertical collision risk satisfied the following AFI RVSM Safety Policy objectives:

(i) In accordance with ICAO Guidance Material, the management of vertical collision risk within RVSM airspace shall meet a Target Level of Safety (TLS) of 5×10^{-9} fatal accidents per flight hour;

(ii) In accordance with ICAO Guidance Material, the risk of mid-air collision in the vertical dimension within RVSM airspace, due to technical height-keeping performance, shall meet a Target Level of Safety (TLS) of 2.5×10^{-9} fatal accidents per flight hour.

The safety objective for technical vertical risk is based on a global TLS of 2.5×10^{-9} fatal accidents per flight hour. The safety objective for total vertical risk was set by regional agreement in terms of a TLS of 5×10^{-9} fatal accidents per flight hour. The same total TLS has been in use in other ICAO Regions as well. It was agreed that the total TLS would not be partitioned into individual budgets for the risk due to different causes. This does not preclude, however, the assessment of the technical risk against the smaller TLS of 2.5×10^{-9} fatal accidents per flight hour.

The **first** collision risk assessment showed that the total vertical TLS would not be met. It was agreed, therefore, that measures would be taken to reduce the frequency of operational errors in the airspace and to perform a **second** collision risk assessment in due course, demonstrating the effectiveness of the measures in reducing the total vertical collision risk to below the TLS of 5×10^{-9} fatal accidents per flight hour.

A second CRA was conducted with much improved results and is attached as reference.

G.2 Data

The main parameters of the technical and total vertical collision risk models are the probabilities of vertical overlap due to the different causes. Height monitoring data from the European height monitoring programme have been used to estimate the probability of vertical overlap due to normal technical height-keeping deviations. Such data was available for almost all the aircraft groups expected to be operating in AFI RVSM airspace. Default assumptions on RVSM approved aircraft were made for a few remaining groups. Some monitoring data on those groups is expected to become available in the near future and may be used to confirm the assumptions made.

Various sources of data have been used to estimate the probability of vertical overlap due to all causes other than normal technical height-keeping deviations. Firstly, use has been made of data on large height deviations and other operational issues reported to ARMA by many African States on a monthly basis. Secondly, some air proximity reports, air miss reports and incident data made available by IATA, CAA South Africa and ICAO have been utilised. Nonetheless, there remains considerable concern as to whether a complete and fully representative sample of operational error data was obtained. In this context, it has been emphasised that all the stakeholders involved with AFI RVSM must do the utmost to ensure that sufficient and reliable data on operational issues becomes available.

The next important parameter of the vertical collision risk models is passing frequency. This was estimated from traffic flow data collected by ARMA from the African States on a monthly basis. A number of data limitations were identified. These limitations must be eliminated for the future in order to make the passing frequency estimation process more precise and reliable.

G.3 Technical vertical collision risk

Based on current traffic levels, the technical vertical collision risk was estimated as 1.35×10^{-9} fatal accidents per flight hour, i.e. well below the technical TLS of 2.5×10^{-9} fatal accidents per flight hour. Opposite direction traffic is the main contributor to the risk. The precision of lateral navigation is an important factor with regard to vertical collision risk. It has been assumed that 50% of the flying time in AFI RVSM airspace would be based on GNSS navigation and the remaining 50% on VOR/DME navigation. The risk mitigating effect of strategic lateral offsets has not been taken into account. The risk increasing effect of future traffic growth has not been incorporated either.

The estimate for the technical vertical collision risk is considered to be conservative as no credits have been taken for the redistribution of the traffic under RVSM. The risk estimate is considered to be not conservative with regard to the data limitations affecting the passing frequency estimation. Nonetheless, the margin between the technical TLS and the estimate of the technical vertical risk is believed to be sufficient to account for these limitations.

G.4 Total vertical collision risk

The total vertical collision risk was estimated using two different models, referred to as the conventional model and the conditional model respectively.

The conventional model includes three sub-models representing the following components of vertical collision risk: risk due to large height deviations not involving a whole number of flight levels; risk due to climbing and descending through a flight level without a proper clearance; and risk due to levelling off at a wrong flight level. In addition, several variations within the sub-models have been developed in order to obtain the most appropriate model. The total vertical risk was estimated to be 65.2×10^{-9} fatal accidents per flight hour. This estimate exceeds the total vertical TLS of 5×10^{-9} fatal accidents per flight hour by a factor of approximately 13. It should also be noted that the vertical collision risk due to large height deviations not involving a whole number of flight levels as well as the risk due to levelling off at a wrong flight level were individually already in excess of the total vertical TLS.

The conditional model is a modification of the conventional model to compensate for a possible underestimation of the risk due to ATC errors. This involves incidents where separation between two aircraft was lost or would have been lost without resolving action having been taken. The conditional model also uses the above-mentioned sub-models, but differs from the conventional model in estimating the risk due to climbing and descending through a flight level without a proper clearance and in estimating the risk due to levelling off at a wrong flight level. It is believed that the conditional model provides a more reliable estimate for the total vertical risk. However, using the conditional model, the total vertical risk was estimated to be 342.6×10^{-9} fatal accidents per flight hour. This estimate exceeds the total vertical TLS of 5×10^{-9} fatal accidents per flight hour by a factor of approximately 70.

It was thus concluded on the basis of the data available that the total vertical collision risk did not meet the total vertical TLS of 5 x 10^{-9} fatal accidents per flight hour. The estimates obtained with the conventional and conditional models considerably exceeded the total vertical TLS, viz. by factors of 13 and 70 respectively.

G.5 Conclusion and follow-up activities

The technical vertical TLS was found to be met but the total vertical TLS was found not to be met. Therefore, a second pre-implementation collision risk assessment is required before RVSM may be implemented in the AFI Region. This second collision risk assessment shall only be initiated after appropriate measures haven been taken to reduce the frequency of operational errors in the airspace and after some time has passed to allow the effect of these measures to become apparent.

G.6 Conclusion and follow-up activities

The collision risk assessment was performed by two staff members from the National Aerospace Laboratory NLR (The Netherlands) based on their experience in safety assessment in general and for RVSM in particular. The latter experience reaches from the ICAO RGCSP assessment of the feasibility of RVSM in the 1980s, the implementation of RVSM in the NAT and EUR Regions up to the most recent annual RVSM safety assessment for the EUR Region. Detailed curricula vitae were submitted prior to contract award.

The team's experience was not limited to collision risk modelling and estimation but was also used for the benefit of the development of the overall safety argument for the AFI RVSM PISC, the formulation of the high-level safety requirements and the translation of those requirements into System Element Requirements, in particular for Airspace Design, Aircraft Equipment and System Monitoring.

A second CRA was conducted and is attached for reference purposes.

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Appendix H: National Safety Plans and State Safety Awareness (or readiness)

State	Safety Plan Approved	Signed By State Authorities	Lodged With ARMA or ARPO	Comments
Algeria	Yes	Yes	Yes	
Angola	Yes	Yes	Yes	
Benin	Yes	Yes	Yes	
Botswana	Yes	Yes	Yes	
Burkina Faso	Yes	Yes	Yes	
Burundi	Yes	Yes	Yes	
Cameroon	Yes	Yes	Yes	
Cabo Verde	Yes	Yes	Yes	NSP as Developed for Carsamma
Central African Republic	Yes	Yes	Yes	
Chad	Yes	Yes	Yes	
Comores	Yes	Yes	Yes	
Congo	Yes	Yes	Yes	
Côte d'Ivoire	Yes	Yes	Yes	
Djibouti	Yes	Yes	Yes	
Democratic Republic of Congo	Yes	Yes	Yes	
Egypt	Yes	Yes	Yes	NSP as Developed for Midrma
Equatorial Guinea	Yes	Yes	Yes	
Eritrea	Yes	Yes	Yes	
Ethiopia	Yes	Yes	Yes	
Gabon	Yes	Yes	Yes	
Ghana	Yes	Yes	Yes	
Guinea Bissau	Yes	Yes	Yes	
Guinea	Yes	Yes	Yes	
Kenya	Yes	Yes	Yes	
Lesotho	Yes	Yes	Yes	
Liberia	Yes	Yes	Yes	
Libyan Araba Jamahiriya	Yes	Yes	Yes	
Madagascar	Yes	Yes	Yes	
Malawi	Yes	Yes	Yes	
Mali	Yes	Yes	Yes	

State	Safety Plan Approved	Signed By State Authorities	Lodged With ARMA or ARPO	Comments
Mauritania	Yes	Yes	Yes	
Mauritius	Yes	Yes	Yes	
Morocco	Yes	Yes	Yes	NSP as Developed for Eurocontrol
Mozambique	Yes	Yes	Yes	
Namibia	Yes	Yes	Yes	
Niger	Yes	Yes	Yes	
Nigeria	Yes	Yes	Yes	
Reunion	Yes	Yes	Yes	
Rwanda	Yes	Yes	Yes	
Sao Tome	Yes	Yes	Yes	
Senegal	Yes	Yes	Yes	
Seychelles	Yes	Yes	Yes	
Sierra Leone	Yes	Yes	Yes	
Somalia	Yes	Yes	Yes	
South Africa	Yes	Yes	Yes	
Sudan	Yes	Yes	Yes	
Swaziland	Yes	Yes	Yes	
Tanzania	Yes	Yes	Yes	
The Gambia	Yes	Yes	Yes	
Togo	Yes	Yes	Yes	
Tunisia	Yes	Yes	Yes	NSP as Developed for Eurocontrol
Uganda	Yes	Yes	Yes	
Zambia	Yes	Yes	Yes	
Zimbabwe	Yes	Yes	Yes	

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