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Conflict Detection and Resolution Tools System Requirements Refinement - R5

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DFS, ENAV, INDRA, NATMIG, NATS, LEONARDO, THALES

Abstract

This Technical Specification (TS) document contains the final technical requirements for the Conflict Management function within the ENR/APP ATC System for SESAR Step 1. This TS document is based on the operational concepts and requirements described in:
- 04.07.02 project (for the En-Route environment)
- 05.07.02 project (for the TMA environment)
- 04.07.02 Free-Route documents (for the Direct Routing and Free-Routing environments)

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Rational for rejection
None.

8

9 Document History

Edition	Date	Status	Author	Justification
00.00.01	29/04/2016	Draft	INDRA, NATMIG, THALES	Initial version, based on D71 incorporating impacts from: • Free Route OSED analysis • 05.07.02 M033 (OSED) analysis
00.00.02	13/06/2016	Draft	INDRA, NATMIG, THALES	Impact from: • 05.07.02 D77 (OSED) analysis • 05.07.02 D78 (SPR analysis) • 04.07.02 clarifications
00.00.03	17/06/2016	Draft	INDRA, NATMIG, THALES	Update after review of the core team
00.00.04	25/07/2016	Draft	THALES	Update after the internal review Impact from D71 SJU assessment Impact from: • 04.07.02 M179 (Final Draft for SPR_4) • 04.07.02 M177 (Final Draft for OSED_4) • 04.07.02 M182 (Final Draft for Free Route SPR)
00.00.05	01/08/2016	Draft	INDRA, NATMIG, THALES	Update after review of the core team
00.00.06	29/08/2016	Draft	THALES	Update after the internal and external review
00.01.00	30/08/2016	Final	INDRA,THALES	Version for hand-over
00.02.00	14/10/2016	Final	THALES	Version for re-submission after SJU assessment

10 Intellectual Property Rights (foreground)

11   This deliverable consists of SJU foreground.

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Executive summary

This Technical Specification (TS) document contains the technical requirements for the Conflict Management function within the ENR/APP ATC System for SESAR Step 1. The document is deliverable D78 for P10.04.01.

The previous version [13] of the TS document were based on the operational concepts and requirements described in:

- the 04.07.02 OSED (the latest version incorporated was 04.07.02 D22)
- the 04.07.02 SPR (the latest version incorporated was 04.07.02 D30)
- the 05.07.02 OSED (the latest version incorporated was 05.07.02 M088)
- the 05.07.02 SPR (the latest version incorporated was 05.07.02 M086).

For this version of the TS, the main scope is the incorporation of the last validation results included in the final requirements provided by operational projects. Also Free Route OSED and SPR requirements have been considered as input.

The 04.07.02 OSED and SPR that are incorporated into this TS describes a concept of operations made up by the following three separation services:

- Conflict Detection and Resolution Aid to Planning Controller (CD&R Aid to PC)
- Conflict Detection and Resolution Aid to Tactical Controller (CD&R Aid to TC)
- TRajectory Adjustment through Constraint of Time (TRACT)

The 05.07.02 OSED and SPR, which are focused on the separation management in the Terminal Manoeuvring Area (TMA), describe a concept made up of the CD&R aid to PC and CD&R aid to TC only.

The Free Route OSED and SPR include requirements about CD&R aid to PC and CD&R air to TC.

Note: although the current Separation Management concept includes three Separation Services for completeness, the "CD/R aid to the PC" and the "TRACT" services are out of the SESAR Solution #27 because they have not yet reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the OSED and SPR, are considered as input.

The requirements contained in this TS document have been written to support the conflict detection and resolution scope for any combination of these services. Based on input from the 10.10.02 project, detailed HMI requirements related to the Conflict Management function have been included in the document. However, the detailed requirements for trajectory prediction and trajectory conformance monitoring are covered by other SESAR projects (10.02.01 and 10.04.02) and are not included here.

The main differences compared to the previous version of the Technical Specification [13] are:

- updates in accordance with the latest 04.07.02 OSED [14] and SPR [15] documents including last V3 validation results
- updates in accordance with the latest 05.07.02 OSED [16] and SPR [17] documents including last V2 validation results
- traceability to Free Route OSED [18] and SPR [19]
- identification of the requirements involved in a validation exercise through the requirement attribute "STATUS" set to "VALIDATED".

1 Introduction

This Technical Specification (TS) contains a description of the ATC Conflict Detection and Resolution capabilities and functional requirements. This is the final version of the document, which is based on:

- 10.04.01 D71 – The fourth version of this TS document [13]
- 04.07.02 M177 - The latest available 04.07.02 OSED [14]
- 04.07.02 M179 - The latest available 04.07.02 SPR [15]
- 05.07.02 D77 - The latest available 05.07.02 OSED [16]
- 05.07.02 D78 – The latest available 05.07.02 SPR [17]
- 04.07.02 D37 – The latest available Free Route OSED [18]
- 04.07.02 M182 – The latest available Free Route SPR [19]
- 10.01.07 D120 - The latest available 10.01.07 TAD [7]

The terminology used in the TS document is identical to the terminology introduced in the 04.07.02 OSED.

Please note the distinction made between a conflict and an encounter throughout this document. The term 'conflict' is reserved for situations where the ATC ground system judges that the separation minima are compromised while the term 'encounter' is used to identify situations where the ATC ground system determines that the system separation of interest is compromised. While the objective of the tools described herein is to help the ATCO to avoid conflicts, it is often beneficial for the tools to detect a potential problem scenario that starts before actual infringement of the separation minima. Hence, the system separation of interest must be greater than or equal to the separation minima.

The SESAR program makes possible the development of improved ground based ATCO tools by taking advantage of the increased availability and accuracy of flight data to generate reliable traffic predictions. Nowadays ATCOs make use of ground based tools to help track the current position and speed of aircraft in their area of responsibility, while they have to rely on their own mind to calculate and visualize the future traffic picture in order to make effective separation decisions. The new tools/services covered in this Technical Specification will offer ATCO reliable predictions regarding the traffic situation in the near future in order to help to detect and also, at various degrees, to resolve some of the conflicts. These conflict detection & resolution tools will use the trajectory information as it is specified by the SESAR 10.02.01 project. The three new operational services covered are:

- Conflict Detection and Resolution Aid to Planning Controller (CD&R Aid to PC)
- Conflict Detection and Resolution Aid to Tactical Controller (CD&R Aid to TC)
- TRajectory Adjustment through Constraint of Time (TRACT)

> **Note**: although the current Separation Management concept includes three Separation Services for completeness, the "CD/R aid to the PC" and the "TRACT" services are out of the SESAR Solution #27 because they have not yet reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the OSED and SPR, are considered as input.

The TS includes all Technical Requirements related to these three concepts. The requirements involved in a validation exercise can be identified through the requirement attribute "STATUS" set to "VALIDATED". A requirement labelled as "VALIDATED" means that the requirement is verified and involved in a validation exercise that achieved V3. For these validated requirements, the rationale indicates the related validation exercise, the related validated concept, and the exercise maturity.

The "STATUS" for some requirements indicate "IN PROGRESS" because they were not implemented in a prototype used for a validation exercise:

- either because they were not mandatory for the scope of the validation exercises
- or because they are lessons learned from the validation exercise (validation results)

165 **1.1 Purpose of the document**

166 This Technical Specification (TS) document contains ATC system requirements for the Conflict
167 Detection and Resolution Tools for the SESAR Step 1 capability. The relationship between the TS
168 document and the other SESAR documents is illustrated in Figure 1:
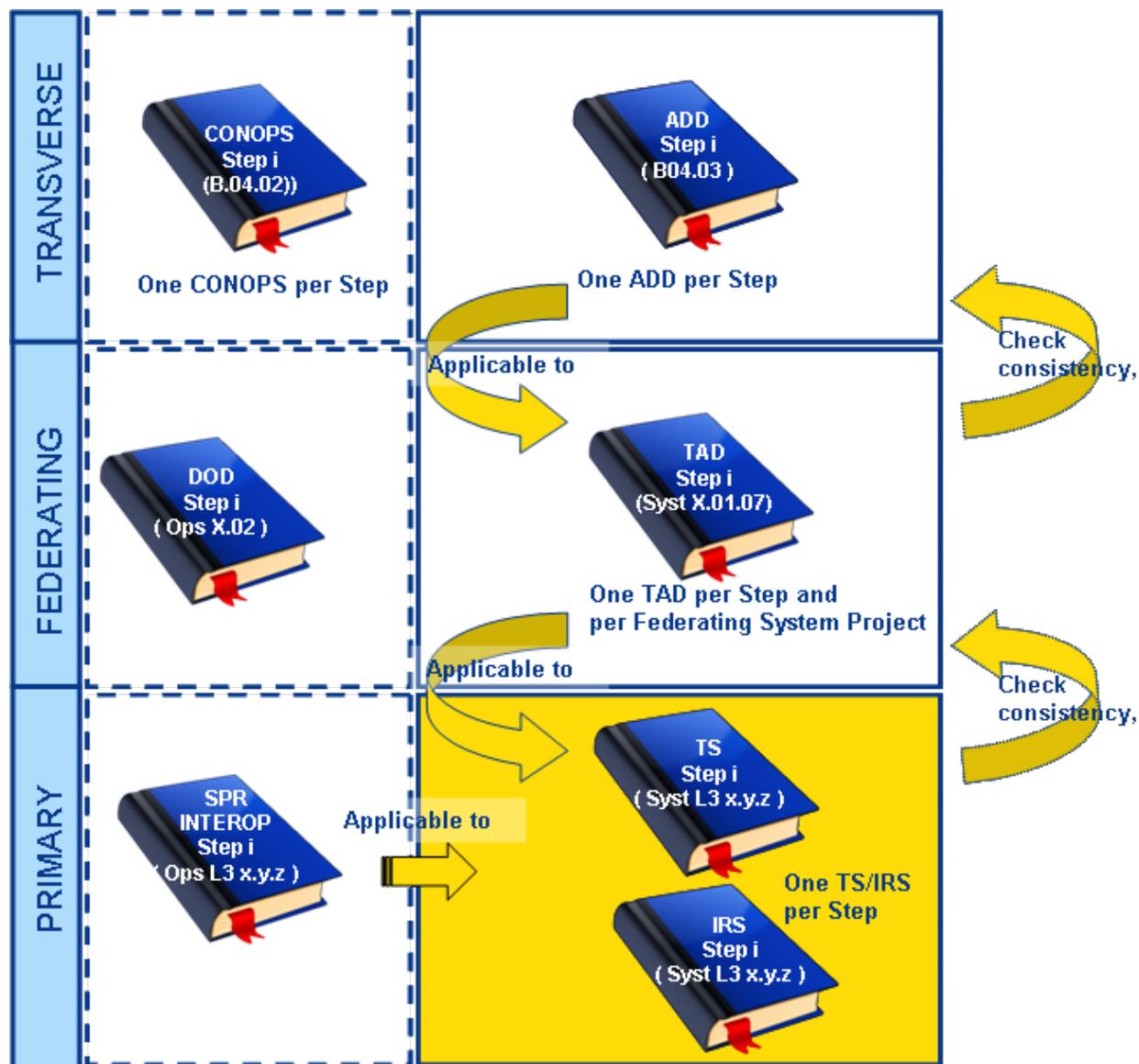

169   Figure 1: TS document with regards to the other SESAR deliverables

170 In support of the generation of the 10.04.01 Step 1 functional requirements, operational input has
171 been received from the 04.07.02 and 05.07.02 projects. This TS version incorporates the final
172 operational inputs, including latest validation results, of the 04.07.02 and 05.07.02 projects. Also Free
173 Route OSED and SPR requirements have been considered as input.

174 The 04.07.02 OSED describes a concept of separation management for the en-route trajectory based
175 environment made up by the following three services:

176   • TRajectory Adjustment through Constraint of Time (TRACT)

177   • Conflict Detection and Resolution Aid to Planning Controller (CD&R aid to PC)

178   • Conflict Detection and Resolution Aid to Tactical Controller (CD&R aid to TC)

179 The requirements contained in this TS document are written to support any combination of these
180 services.

181 Due to a significant difference in concept maturity, project 04.07.02 decided to develop 2 SPR
182 documents; one SPR covering CD&R aid to PC and CD&R aid to TC and a second SPR covering
183 TRACT. The 10.04.01 project takes into account the first SPR [15] as an input to this TS document.

184 The 05.07.02 OSED, which is focused on the separation management in the Terminal Manoeuvring
185 Area (TMA), describes a concept made up of the CD&R aid to PC and CD&R aid to TC only.

186 The Free Route OSED and SPR include requirements about CD&R aid to PC and CD&R air to TC.

187 The architecture required for Conflict Detection and Resolution makes up high-level functional block
188 "Conflict Management" from P10.01.07 delivery D120 "Technical Architecture Description (TAD) -
189 Cycle 2015" [7]. In this TS document, the functionality is further broken down into 4 functional sub-
190 blocks called "Conflict Data Manager", "Tactical Conflict Detection", "Planning Conflict Detection" and
191 "Solver Service" as illustrated by Figure 9.

192 Several prototypes are developed in compliance with these TS requirements in order to support
193 validation activities. Indra, Leonardo and Thales all develop prototypes to support 04.07.02, 05.07.02
194 and 04.03 validation activities.

195 .

1.2 Intended readership

197 The intended readership includes:

198 • All the operational projects linked to the 10.04.01 project (including 04.07.02, 04.07.08,
199   04.03, 05.07.02 and 05.07.03) for coordination and validation purposes.

200 • The ATC System Specification project (10.01.07).

201 • Other WP10 projects for information and coordination purposes, including:

202   o 10.02.01 (The trajectory data are required inputs into the CD&R requirements
203   defined in section 3 of this document, hence a common understanding between the
204   two projects is essential in order to achieve both a well-defined ground system
205   concept and a functioning prototype.)

206   o 10.04.02 (The implementation of the CD&R requirements in section 3 are
207   independent from the System Monitoring requirements, but a shared awareness
208   between the two projects ensures that the functionality complements each other as
209   intended.)

210   o 10.10.02 and 10.10.03 (The detailed HMI requirements related to the 10.04 01 scope
211   have been included in this TS document based on input from the 10.10.02 project.)

212 • Internal project members.

213

1.3 Inputs from other projects

215 The first version of this TS document (10.04.01 D06) [10] was partly based on the 10.04.01 D04
216 Initial Baseline document [9]. Some of the relevant content from the baseline document is also
217 included in the current version of the TS document. The main inputs to the baseline document are
218 summarized in Table 1 below.

219

Project Reference	Document Title	Document identification	Authorized by

[iTEC-eFDP]	iTEC - eFDP System Requirements Specification (SRS)	Core iTEC V1_eFDP_SRS_1.0_2009-06-0	DFS
[FASTI_OC]	First ATC Support Tools Implementation (FASTI) - Operational Concept	Edition: 1.1 Edition Date: 20 March 2007	EUROCONTROL
[FASTI_MTCD]	EUROCONTROL Specification for Medium-Term Conflict Detection	Edition Number : 1.0 Edition Date: 15/07/2010	EUROCONTROL
[FASTI_TP]	Draft EUROCONTROL Specification for Trajectory Prediction	Edition Number : 1.0 Edition Date: 15/07/2010	EUROCONTROL
[CoFlight]	CoFlight eFDP System Overview V1R0;	MT-02598, Version: V1R0, dated 11/02/10	ENAV/DSNA
	CoFlight FTRD V5R0	DTI/ATM/0808884/VIG	
	CoFlight System parameters and Capacities;		
	CoFlight Performance, Capacity and Dependability Specification;	Rev 00.01, dated 17/12/09	
[4Flight]	4-FLIGHT CFT PREPARATION PHASE USER REQUIREMENTS DOCUMENT	V 3.2 dated 04/02/10	ENAV/DSNA

220   Table 1: Baseline References

1.4 Structure of the document

222 This document is structured as follows:

223 Chapter 1 - An introduction with a high-level overview.

224 Chapter 2 - A general description of the functional blocks, user characteristics and operational
225 scenarios.

226 Chapter 3 - A description of system requirements, including capabilities, operating conditions and
227 constraints.

228 Chapter 4 - A description of all key assumptions.

229 Chapter 5 - Provides a list of references and a summary of how classified material should be handled.

1.5 Requirements Definitions – General Guidance

231 All the requirements are provided in Chapter 3 of the document. The main sections are structured in
232 accordance with the SESAR TS Template:

233   Section 3.1: Capabilities
234   Section 3.2: Adaptability
235   Section 3.3: Performance Characteristics
236   Section 3.4: Safety & Security
237   Section 3.5: Maintainability
238   Section 3.6: Reliability
239   Section 3.7: Functional block Internal Data Requirements
240   Section 3.8: Design and Construction Constraints

241   Section 3.9: Functional block Interface Requirements

242

243   The key functional requirements for Conflict Detection are provided under "Capabilities" in section 3.1.
244   As the Conflict Management block has been divided into four lower level functional sub-blocks in this
245   document, one block for general management and one associated with each of the three services, the
246   requirements in section 3.1 have been organized in the same manner. A fifth section has been added
247   to include HMI requirements provided by project 10.10.02.

248   Section 3.1: Capabilities

249   Section 3.1.1: Conflict Data Manager

250   Section 3.1.2: Tactical Conflict Detection

251   Section 3.1.3: Planning Conflict Detection

252   Section 3.1.4: Solver Service

253   Section 3.1.5: CWP requirements

254

255   Generally, the Conflict Data Manager section includes the requirements that are independent of the
256   specific detection mode, whereas the detailed requirements for each detection mode are covered in
257   the dedicated sections.

258   The requirements have been developed according to the SESAR "Requirements and V&V
259   Guidelines" document.

260   Each requirement related to Conflict Management Functional Block has been numbered according to
261   the following template:

262   REQ-10.04.01-TS-abcd.efgh

263   Where:

264   -   abcd = 0001 for requirements related to Conflict Data Manager
265   -   abcd = 0002 for requirements related to Tactical Conflict Detection
266   -   abcd = 0003 for requirements related to Planning Conflict Detection
267   -   abcd = 0004 for requirements related to Solver Service
268   -   abcd = 0005 for requirements related to Functional Block Interfaces
269   -   abcd = 0006 for requirements provided by 10.10.2 project: they are HMI requirements related
270   to 10.04.01 scope and allocated to CHMI Functional Block.
271   -   abcd = SAFE for safety requirements that apply to the Conflict Management Functional Block.
272   -   abcd = PERF for performance requirements that apply to the Conflict Management Functional
273   Block.
274   -   efgh are 4 numeric characters

275

276   Requirements use the following recommended layout

277

Identifier	
Requirement	
Title	
Status	
Rationale	
Category	
Verification Method	

278
279

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	Enabler code	<Full>
<SATISFIES>	<ATMS Requirement>	INTEROP or SPR Requirement Identifier	<Full>
<ALLOCATED TO>	<Functional block>	Functional block Identifier	N/A
<APPLIES_TO>	<Operational Focus Area>	Operational Focus Area Identifier	N/A
<CHANGED BECAUSE OF>	<Change Order>	Change reference	N/A

<ALLOCATED TO>	<Project>	Project Identifier	N/A

280   Table 2: Requirements layout

281   The "Identifier" field contains the System project number, owner of the requirement.

282   The "Status" field is "Deleted" when the requirement has been removed compared to previous
283   versions of this TS document.

284   The "Status" field is "Validated" when the requirement has been implemented in a project prototype
285   used in a Validation exercise (then listed in at least one of the project Availability Notes).

286   The "Rationale" field may contain:

287   •   Justification of the allocation

288   •   Explanation about the requirement formulation

289   •   The list of validation exercises involving the requirement, the related validated concept
290   (tactical conflict detection or planning conflict detection) and the validation exercise maturity.

291   The REQ Trace table contains the down-links to the functional block that receive the allocated
292   requirement. There can be several down linked functional blocks for a given requirement.

1.6 Functional block Purpose

294   The Conflict Management functional block that is the topic of this TS document includes a number of
295   tools to help ATCO to maintain traffic separation in a trajectory based environment. The scope is En-
296   route and TMA operations. The enablers for the requirements in this technical specification are
297   primarily based on the relevant Operational Improvements from the 04.07.02 and 05.07.02 OSEDs,
298   which are based on the DS16 dataset [8], with some proposed changes resulting from the Release 5
299   System Engineering Review:

300   •   OI step CM-0205 only partially achieved V3 in R5, and so is being split into a V3 part (tactical
301   conflict detection, CM-02xx) and V2 part (planning conflict detection, CM-02yy). Due to time
302   constraints, these new OIs and enablers will not belong to DS16 and will be published later,
303   for SESAR2020.
304   •   the dependent enabler (ER_ATC_157) is being split accordingly: ER_ATC_157 scope limited
305   to the tactical conflict detection, new ER_ATC_157-yy for planning conflict detection.

306   The enablers are summarized in **Table 3** below:

Enabler	Relevant Operational Improvement (from 04.07.02 OSED)	Related CD&R Service
ER_ATC_157	CM-02xx: Advanced Conflict Detection and Resolution in En-Route AOM-0500: Direct Routing for flights both in cruise and vertically evolving for cross ACC borders and in high & very high complexity environments AOM-0501: Free Routing for Flights both in cruise and vertically evolving within low to medium complexity environments	CD&R Aid to TC
ER_ATC_157-yy	CM-02yy: Advanced Conflict Detection and Resolution in En-Route AOM-0500: Direct Routing for flights both in cruise and vertically evolving for cross ACC borders and in high & very high complexity environments AOM-0501: Free Routing for Flights both in cruise and vertically evolving within low to medium complexity environments	CD&R Aid to PC

founding members

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ER_ATC_162	CM-0403-A: Early Conflict resolution through CTO allocation in STEP1	TRACT
APP_ATC_155	CM-0206: Conflict Detection and Resolution in the TMA using trajectory data	CD&R Aid to PC CD&R Aid to TC

<p align="center">Table 3: Summary of Enablers for CD&R Services</p>

309 The Conflict Management functional block supports the following separation services:

310 • Conflict Detection and Resolution Aid to Planning Controller (CD&R Aid to PC) → A medium
311 term CD&R tool with a conflict horizon of 25 minutes supported by a Planning Trajectory
312 Prediction.

313 • Conflict Detection and Resolution Aid to Tactical Controller (CD&R Aid to TC) → A short term
314 CD&R tool with a conflict horizon of 8 minutes supported by a Tactical Trajectory Prediction.

315 • Automated System Separation Service (TRACT) → Tool that identifies and resolves
316 encounters without active ATCO involvement, supported by Trajectory Prediction.

317 The trajectory prediction mentioned above and also the necessary trajectory conformance monitoring
318 is not in scope for this TS document. The computation of trajectories is addressed by SESAR project
319 10.02.01 and will be available to the Conflict Management block as inputs from the Trajectory
320 Prediction & Management functional block. The conformance monitoring is addressed by SESAR
321 project 10.04.02.

322 Furthermore, the Conflict Management functional block (CONF) does not include the actual HMI or
323 displays, as this is the scope of the Controller Human Machine Interface (CHMI) functional block. All
324 requirements related to the display of data are CHMI responsibility. Project 10.10.2 has provided the
325 necessary HMI requirements related to 10.04.01 scope, and these requirements are included in
326 Chapter 3 of this TS document. The HMI prototypes will be developed based on these closely
327 coordinated requirements.

328 Note that this Technical Specification does not make any assumptions regarding system
329 implementation/architecture. Hence, detailed interface requirements between CONF and CHMI are
330 not included in this document. If a particular implementation requires keeping track of conflict status
331 data in a centralized location, it will be necessary to add CONF scope to support CHMI functions
332 related to conflict distribution, conflict responsibility, conflict display, conflict acknowledgement and
333 similar.

1.7 Functional block Overview

335 This Technical Specification describes the ER/APP functional block "Conflict Management" that is
336 included in the high level illustration from the Technical Architecture Description - Cycle 2015 [7] and
337 that has been reproduced in the figure below.

338
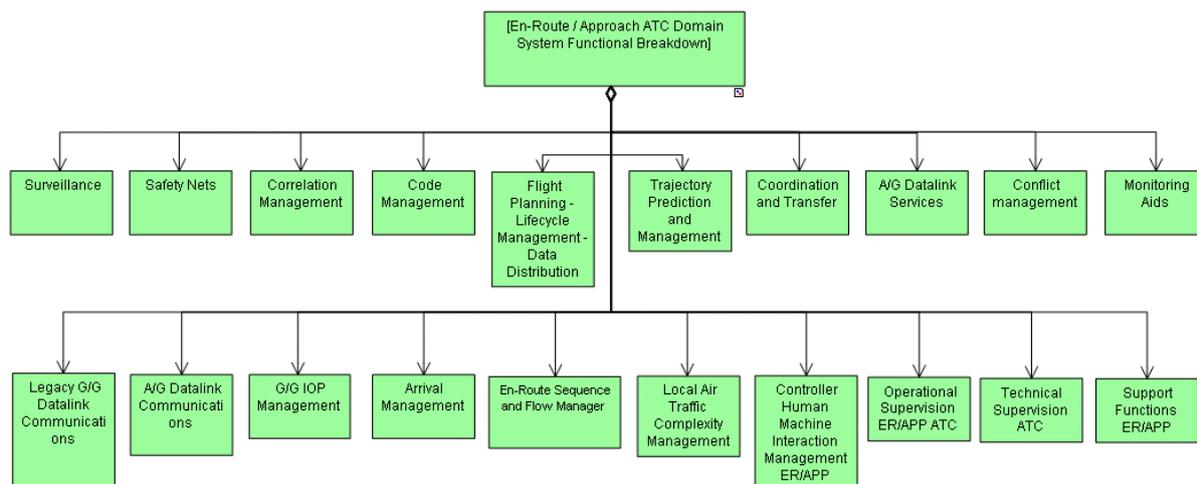
340   Figure 2: ER/APP Functional Blocks.

341   The main purpose of this functional block is to provide Conflict Detection and Resolution (CD&R)
342   assistance to the ATCO(s).

343   The CD&R services will include automatic detection of encounters and resolution aids with What-if
344   and What-else capability that are customized to suit the foreseen needs of both Planning Controller(s)
345   and Tactical Controller(s) for a given area of interest. Some conflicts will also qualify for automatic
346   resolution. The improved suite of CD&R tools will ultimately result in reduced ATCO workload and
347   increased airspace capacity.

348

1.8 Glossary of terms

350   The following terms are defined as in 04.07.02 OSED deliverable [14] and are used throughout this
351   document. They are copied here to make the reading easier. Note that some of these terms are not
352   used in this document but they have been kept in the glossary to facilitate the understanding.

353

Separation Related Terms.
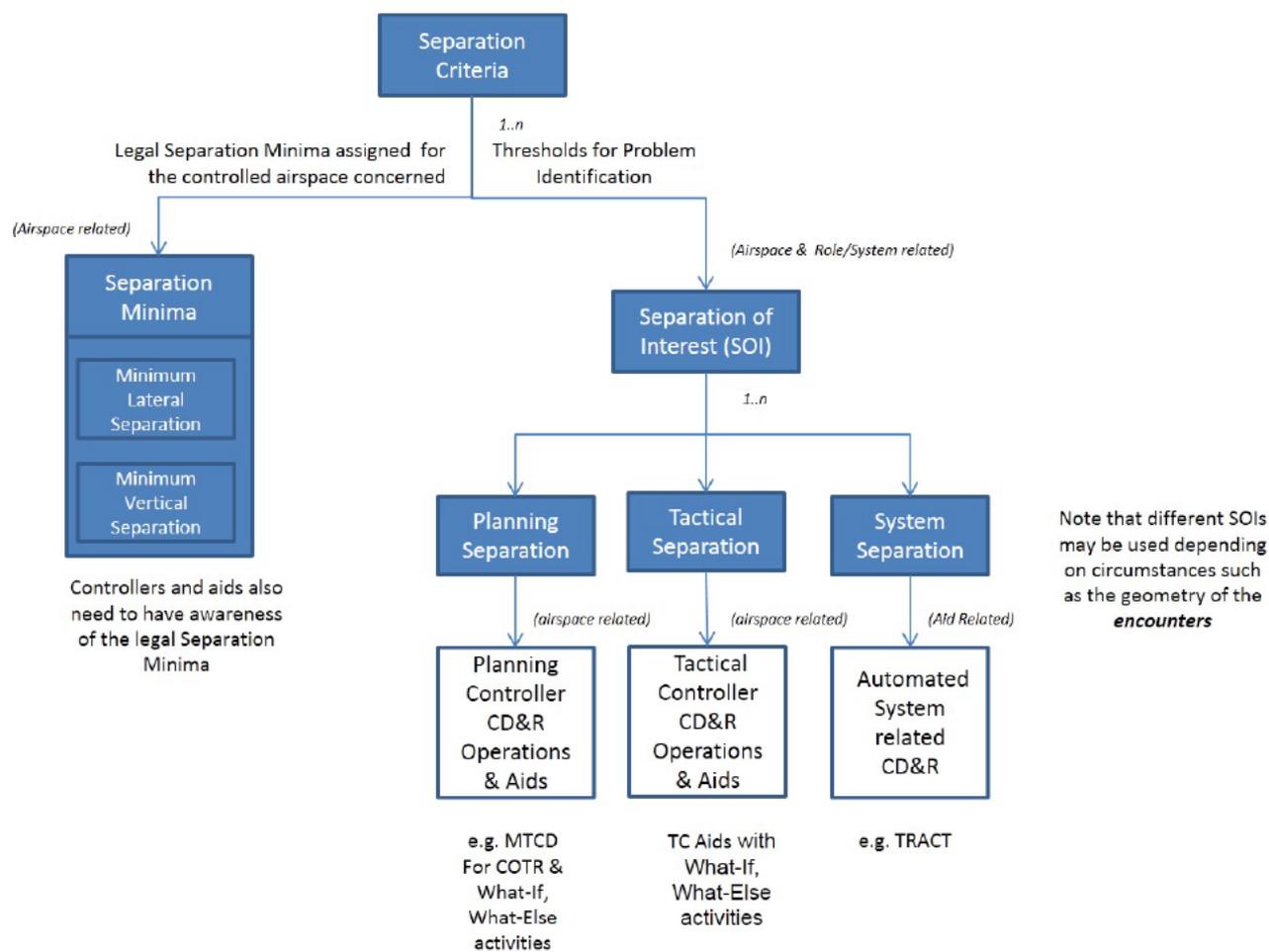
Figure 3: Separation related Entities.

Term	Definition
Separation Criteria	A generic term which covers the *Separation Minima* and the thresholds used for problem identification.
Separation	Spacing between an aircraft and a *Hazard*.
Lateral Separation	*Separation* expressed in terms of horizontal distance and function of angular convergence/divergence between tracks
Vertical Separation	*Separation* expressed in units of vertical distance
Separation Minima Related Terms <u>Note</u>: that the separation minima define the legal separation between hazards in a controlled airspace.	
Separation Minima	The minimum displacements between an aircraft and a *Hazard* which maintain the risk of collision at an acceptable level of safety. <u>Note</u>: ICAO Doc 9689 describes the methodology to be used for the determination of *Separation Minima*.
Minimum Lateral	The *lateral separation* threshold above which the *separation minima* are fulfilled

Separation	
Minimum Vertical Separation	The *vertical separation* threshold above which the *separation minima* are fulfilled Note: Different thresholds are applied above and below the *RVSM* limit. Any non-RVSM aircraft that is authorized to fly within an RVSM airspace shall be subject to the thresholds that are applied over the RVSM airspace.
Reduced Vertical Separation Minimum (RVSM)	A reduction to 1000 feet *vertical separation* between flights, which is used at least in Europe and on the North Atlantic, between FL290 and FL410.
Separation of Interest	The *separation* threshold below which the proximity of a pair of aircraft is considered to be of interest to a controller, for the airspace and conditions concerned. Note: At this point there may be no actual risk that *separation minima* are infringed. The values chosen for the various controller activities and tools are larger than the separation criteria in order to provide an adequate margin of safety. The controller and the aids used need to have awareness of the applicable separation minima for the airspace concerned. Note: This is a generic term, independent of the planning or tactical layers of separation activity. Particular instances of the *Separation of Interest* may be applied for each level of separation activity. The actual *separation* values used will take into account aspects such as the type of clearance issued, the requested navigation precision and the airspace rules. They will also relate to the type of trajectory used at the specific layer of concern. They may vary according to circumstances such as the geometry of the *conflicts*/*encounters* and prevailing conditions such as adverse weather.
Planning Separation (of Interest)	A particular instance of the *Separation of Interest* which is applied during planning activities. Note: This is a generic term relevant to the planning layers of separation activity. Particular instances of this may be applied for each level of layered planning separation activity. The actual *separation* values used will vary according to the circumstances. For instance, in the case of Planner Controllers coordinating traffic into and out of sectors, it is the horizontal distance/time interval threshold below which the proximity of a pair of aircraft is considered to be of interest to a Planner Controller when determining the acceptability of sector entry or exit co-ordination. The TC may choose to increase this **Planning Separation**, in which case the PC must re-coordinate the relevant aircraft.
Tactical Separation (of Interest)	A particular instance of the *Separation of Interest* which is applied by Tactical Controllers when controlling traffic under their responsibility.
System Separation (of Interest)	A particular instance of the *Separation of Interest* which is applied by automated system tools for the detection of *Encounters*. E.g. the *separation of interest* used by the TRACT tool.

Encounter management Related Terms

- Planned Sequence Trajectory
- Entry Trajectory
- Exit Trajectory
- Context Trajectory
- Deviation Trajectory
- Tentative Trajectories (What-if)
- Speculative Trajectories (What-Else)

- Planned Sequence Trajectory
- Entry Trajectory
- Exit Trajectory
- Context Trajectory
- Deviation Trajectory
- Tentative Trajectories (What-if)
- Speculative Trajectories (What-Else)

TRACT Trajectory

- Tactical Trajectory
- Coordination Trajectory
- Tentative Trajectories (What-if)
- Speculative Trajectories (What-Else)

- Tactical Trajectory
- Coordination Trajectory
- Tentative Trajectories (What-if)
- Speculative Trajectories (What-Else)

Notes :
1. The cardinality for trajectory instances is not shown. An applicability matrix is provided in the 4.7.2 OSED for this purpose.
2. In the case where one of the trajectories is a deviation trajectory the controller concerned will need to be made aware of this.
3. The Planning and Tactical Separations used will depend on circumstances such as the geometry of the encounter and conditions such as adverse weather.

Figure 4: Encounter Management related Entities.

		Subject Flight				
		Planned Sequence Traj.	Entry Traj.	Exit Traj.	Deviation Traj.	Context Traj.
Environmental Flight	Planned Sequence Traj.	Planned Sequence Encounter	--	--	--	--
	Entry Traj.	--	Planning Encounter	Planning Encounter	Planning Deviation Encounter	--
	Exit Traj.	--	Planning Encounter	Planning Encounter	Planning Deviation Encounter	--
	Deviation Traj.	--	Planning Deviation Encounter	Planning Deviation Encounter	Planning Deviation Encounter	--

	Context Traj.	--	--	--	--	Context Encounter

Figure 5: Planning Aircraft vs. Aircraft Encounters.

		Subject Flight	
		Tactical Traj.	Coordination Traj.
Environmental Flight	Tactical Traj.	Tactical Encounter	--
	Coordination Traj.	--	Coordination Encounter

Figure 6: Tactical Aircraft vs. Aircraft Encounters.

(note that speculative/tentative trajectories are not considered in Figure 5 and Figure 6. for the sake of simplicity)[1]

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[1] There is scope for Planner What-If/What-Else probes to build Tactical Tentative/Speculative trajectories.
An example would be when the Planner performs a What-If on the XFL of FL350 with a heading coordination constraint of HDG090, while the Tactical has the flight currently cleared at FL330 flying on its own navigation. The PC Aid would show the results of the What-If and also (some components of) the Planner's TC Aid would show the results of a tentative tactical clearance of FL350, HDG090. When the Planner What-If ends (either by the Planner committing or cancelling the instruction) then the corresponding Tactical What-If shall end.

Additionally, it might be possible to perform a What-Else on top of a What-If (therefore requiring speculative tentative trajectories). For example, during a heading What-If, there may be a simultaneous What-Else probing different levels along that tentative heading. This applies to both the PC Aid and the TC Aid.

The controller may also wish to perform multiple flight What-If/What-Else probes, for instance perform a heading What-If on one flight and then a heading What-Else on another. During a multiple flight What-If/What-Else, all existing primary, deviation, tentative and speculative trajectories shall be probed against each other:

- During a What-If, the subject flight's primary and deviation (if it exists) trajectories will be *replaced* by the tentative trajectory;
- During a What-Else, the subject flight's primary and deviation (if it exists) trajectories will be *augmented* by speculative trajectories.

A multiple flight What-Else could be performed when the controller selects an encounter and asks the PC Aid to suggest a solution. The PC Aid would then run heading What-Else probes on both flights and display a set of acceptable headings to the controller (i.e. either a pair of headings that require the minimum deviation to each flight's route, or a range of possible headings that are free of encounters).
This could also apply when the controller is performing a level What-If (so What-If plus a multiple flight What-Else). It may be possible to extend this to multiple flight What-If & What-Else probes, e.g. if two flights are involved in level What-Ifs and the PC Aid detects an encounter, then a multiple flight heading What-Else probe could then be run.
The controller may add additional flights into the probe set, e.g. if all solutions to one encounter cause (or fail to resolve) an encounter with another flight, then the controller could decide to perform a What-

Hazard	The objects or elements that an aircraft can be separated from.
	Note: In En-Route, these can be: other aircraft, airspace with adverse weather conditions, or airspace with incompatible airspace activity.
Conflict **Potential Conflict** **Predicted Conflict**	These terms relate to any situation involving aircraft and hazards in which the applicable *separation minima* may be compromised.
	Note**:** These terms are in general widespread usage and within the context of this glossary are synonymous. They relate to potential *infringements of separation minima.* More specifically they are used in the context of ATCO activities where actions are performed in order to anticipate and resolve conflicts (potential/predicted) for separation management purposes. This is in contrast to the situations detected and processed by CD/R tools where the terminology used is '*encounters',* which relates to the applicable *Separation of Interest* used by the tool-set, rather than *Separation Minima*.
Encounter	A situation where an aircraft is predicted to be below the applicable *separation of interest* with respect to another aircraft, or a designated volume of airspace, classified respectively as "aircraft-to-aircraft" and "aircraft-to-airspace" encounters.
	Notes: Encounters are related to the various detection tools and may work to different look-ahead time horizons with different separation criteria, using different trajectories. Different tool configurations can therefore be expected to yield different encounters.
	The *Separation of Interest* thresholds are considered with respect to any applicable *uncertainty volumes* around the predicted aircraft position(s).
TRACT Encounter	A specific instance of an *Encounter* which is predicted using the *TRACT Trajectory* and the particular *System Separation.*
Planning Encounter	A specific instance of an *Encounter* which is predicted using any of the planning related *trajectories* and the *Planning Separation*.
Context Encounter	To support the controllers' traffic management task, environmental flights which may be of interest due to their anticipated vertical and lateral profiles, known as **Context flights** (or alternatively "Traffic"), will be highlighted to controllers.
	Context flights may not currently be involved in an encounter with the subject flight based on their current clearance or existing coordinated levels but may need to be considered by the Planner when making coordination choices for their sector.
	Context Encounters are detected between Context Trajectories. There is only one separation threshold, "Context Separation", and therefore no such concept as a "Context Conflict". When referring to **Context Encounters** operationally the environmental flights may just be labelled as "Traffic".
Tactical Encounter	A specific instance of an *Encounter* which is predicted using any of the tactical related *trajectories,* and the *Tactical Separation.*
Planned Sequence Encounter	A specific instance of a *Planning Encounter* which is predicted between two *Planned Sequence Trajectories*.
Coordination Encounter	A specific instance of a *Tactical Encounter* which is predicted between two *Co-ordination Trajectories.*
Planning Deviation Encounter	A specific instance of a *Planning Encounter* which is predicted using at least one *Planning Deviation Trajectory*.
Cluster	A set of one or more *Encounters* that should be treated as a whole when

Else probe including that flight too (i.e. the system would then attempt to identify a set of clearances that would resolve the encounters between all flights in the probe set).

	determining their resolution.
Planning Cluster	A *Cluster* of *Planning Encounters*. Note: A *Planning Cluster* is an operational object that may be handled by ATCOs. The grouping of *encounters* is therefore likely to be an operational decision.
TRACT Cluster	A set of one or more *TRACT Encounters* that are treated as a whole by the TRACT service.
Closest Point of Approach	The point on the *Trajectory*, which is being evaluated, where the distance to the *hazard* is predicted to be minimal. Note: In some cases the evaluation may be made on the basis of a trajectory segment, e.g. when two aircraft join the same route at the same speed. Subsequent points along the trajectory being evaluated, beyond the closest point of approach are separated from the hazard by progressively increasing distance.
Predicted Infringement Point	The point on the *Trajectory*, which is being evaluated, for a particular *Encounter*, where infringement of the applicable *Separation of Interest* is predicted at respective flight positions for the trajectories concerned.
Potential Infringement Point	The point on the *Trajectory*, which is being evaluated, for a particular *Encounter*, where infringement of the applicable *Separation of Interest* may potentially occur within the *uncertainty volumes* for the trajectories concerned.
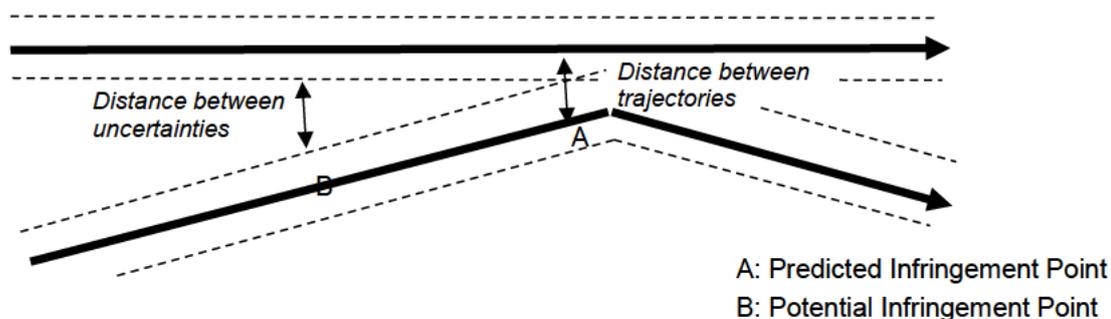
Figure 7: Predicted Infringement Point vs Potential Infringement Point.

What-if Probing	A process where a private copy of a *Trajectory* that is in operational use and associated data is taken and used as a *Tentative Trajectory* to check the impact of changes to the flight data on the occurrence of predicted *Encounters*, without affecting the corresponding data for the actual flight. Note: On completion the what-if data and the *Tentative Trajectory* may be discarded or used to implement an update to the actual flight data and to construct the necessary clearance.
What-else Probing	A process where several *Speculative Trajectories* and associated data arising from *What-If Probing* are assessed for the impact on the occurrence of predicted *Encounters*. The *Speculative Trajectories* utilise flight data other than that currently committed or tentatively selected (during *What-If Probing* operations) by the controller.

Trajectory and Flight Related Terms

See Figure 2 for an overview of the trajectory usage.

Since the needs of the PC and TC differ in many respects, the trajectories produced to support the planning and tactical roles may be different.

Planning Trajectories are used to predict encounters between flights that are of concern to the PC. They take account of the original flight plan, modified by agreed co-ordination constraints and standing agreements, but possibly unconstrained by tactical instructions.

Uncertainty, Uncertainty Volume	The volume of airspace, around the nominal predicted future position of a flight, within which a flight is expected to be contained to a given statistical confidence (e.g. 95%) at the time to which the prediction relates. The uncertainty relates to the trajectory prediction and may therefore be considered as a property of the particular trajectory concerned. Note: The zone can be decomposed into along-track (longitudinal), across-track (lateral) and vertical dimensions.
Trajectory	The predicted behaviour of an aircraft. Note: the *Trajectory* is usually modelled as a set of consecutive segments linking waypoints and/or points computed by the aircraft avionics (e.g. FMS) or by the ground system to build the vertical profile and the lateral transitions. Note: Each point is defined by a longitude, latitude, an altitude and a time.
ADS-C EPP Report EPP Data	ADS-C EPP (Extended Projected Profile) report is the ADS-C report containing the sequence of 1 to 128 waypoints or pseudo waypoints with associated constraints and/or estimates (altitude, time, speed, etc.), gross mass and min/max speed schedule, etc. as defined in WG78/SC214 standards. Note: The aircraft's predicted trajectory is down-linked in accordance with its ADS-C contract parameters. The EPP Data can be used for variety of ATC services.
Tentative Trajectory	Tentative *trajectories* are created from another trajectory that is in operational use (Tactical, Planning or otherwise). They reflect tentative what-if flight data selected by the controller. If these conditions are then committed the Tentative trajectory and the associated data will be used to establish the new operational trajectory. If the conditions are discarded then it will also be discarded. Note: Tentative trajectories support *What-If probing* and are created during this process.
Speculative Trajectory	A *Trajectory* that uses flight data other than those currently committed or tentatively selected (during a *What-If Probing* operation), by the controller. Note: Speculative Trajectories are produced for the purpose of *What-Else probing*.
Tactical Trajectory	The *Tactical Trajectory* is calculated within a short look-ahead time (e.g. up to 15 minutes) during tactical ATC operations (sector planning layer). It therefore reflects an accurate view of the predicted flight evolution, starting from the current flight position (generally, as reported by surveillance), with low *uncertainty* and high precision. It is kept up to date with all clearances, including tactical instructions, except in case of detected deviation. During any open tactical manoeuvres it will also be reflecting those temporary conditions. It is usually determined with a fast update rate (e.g. 5 seconds) and with an optimised *Uncertainty* calculation; to maximise response and minimise the incidence of false alarms. Note: The Tactical Trajectory supports the tactical ATC operations whether the flight follows its normal behaviour or it deviates from its clearances/instructions.
Planning Deviation Trajectory	The *Planning Deviation Trajectory* provides the predicted profile of the aircraft based on the observed behaviour, extrapolated from the particular deviation from coordination. Note: *Planning Deviation Trajectories* are necessary for situations where non-compliance with a flight's coordinated behaviour is observed, with respect to an applicable tolerance threshold. The *Planning Deviation Trajectories* support Planner ATC operations when the flight has deviated from its predicted behaviour. A *Planning Deviation Trajectory* follows the cleared route of the flight, irrespective of any coordination constraints (as the flight has been observed to be deviating from

	these constraints).
	During periods where a **_Planning Deviation Trajectory_** is necessary it may also be used by PC CD/R Aid.
CFL Deviation Window	Interval of Flight Levels the AFL is expected to belong to. In general it is the interval between the previous AFL and the CFL.
Subject Flight	A flight that has been explicitly selected by the Controller concerned.
Subject Trajectory	The **_Trajectory_** of the **_Subject Flight_**
Environmental Flight	A flight of interest to the Controller which is not the **_Subject Flight_**. The **_Subject Flight_** will be checked for **_encounters_** with all **_Environmental Flights_**.
Context Flight	A flight that may need to be considered by the Planner ATCO when making coordination choices for the **_Subject Flight_**, due to the flights' anticipated vertical and lateral profiles.
	Context Flights are those **_Environmental Flights_** that are involved in a **_Context Encounter_** with the **_Subject Flight_**.
	<u>Note</u>: **_Context Flights_** may not currently be involved in a **_Planning Encounter_** based on their current clearance or existing coordinated levels.
Context Trajectory	**_Context Trajectories_** represent the expected utilisation of airspace by each flight. **_Context Trajectories_** are built for the **_Subject Flight_** and **_Environmental Flights_**.
	<u>Note</u>: Context Trajectories are similar to **_Coordination Trajectories_**. Each **Context Trajectory** maintains a single level and follows the lateral profile of the **Planned Trajectory**. **Context Trajectories** are built at every standard Flight Level from the entry-context level to the exit-context level. The identification of entry-context and exit-context levels is dictated by the information available in the system at the time of the probe. They represent the lowest and highest level at which the flight is anticipated to occupy in the sector.
	The Origin and Termination points on **_Context Trajectories_** depend on whether the flight is the **_Subject flight_** or an **_Environmental flight_** and on the flight's anticipated vertical profile.
	Example of Subject Flight **Context Trajectories**:
	Example of Environmental Flight **Context Trajectories**:
Planned Trajectory	The **_Planned Trajectory_** represents the stable medium to long term behaviour of the aircraft but may be inaccurate over the short term where tactical instructions that will be issued to achieve the longer term plan are not yet known.
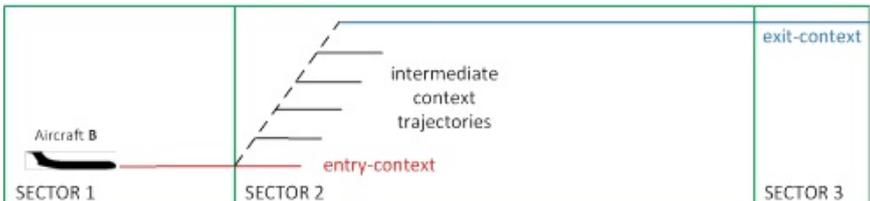
	It takes into account the planned route and requested vertical profile, strategic ATC constraints, **Closed Loop Instructions/Clearances**, co-ordination conditions and the current state of the aircraft. Assumptions may be made to close **Open Loop Instructions/Clearances** issued by tactical controllers.
	It is calculated within the planning look-ahead timeframe, starting from the Area of Interest of the unit concerned, or the aircraft's current position (whichever is later).
	It is constrained during all phases of flight by boundary crossing targets (e.g. standing agreements between the Units concerned).
	Note: The **Planned Trajectory** supports the ATC planning operations. It is used primarily to support data distribution within the system and in the determination of the top of descent point. As such, uncertainty does not need to be calculated for this trajectory. It may also be used as the starting point for derivation of more specific local ATC trajectories.
Planned Sequence Trajectory	A **Trajectory** that is derived from the **Planned Trajectory** as it follows the vertical and lateral profile of the **Planned Trajectory**, truncated in time to an adaptable parameter (e.g. 25 minutes).
	Uncertainty is added (although the lateral uncertainty may be zero).
	Note: The Planned Sequence Trajectory is used for the determination of co-ordination levels and the sector penetration sequence.
	It is used for both manual coordination and integrated coordination purposes and may be used by the CD/R Aid (with the **Planning Separation**) for traversals of the sector concerned (CD/R for entry and exit to the sector are covered by the **Coordination Trajectory**).
Coordination Trajectory Or **[Entry/Exit] Trajectory**	A **Trajectory** that is derived from the **Planned Sequence Trajectory.** It follows the lateral profile of the **Planned Sequence Trajectory**[2] but maintains a specific coordination level relevant to the boundary between two sectors. It represents the expected behaviour of the aircraft according to the entry/exit co-ordination conditions.
	Entry Trajectory = A **Coordination Trajectory** that is built at levels associated with the sector entry coordination for the flight.
	Exit Trajectory = A **Coordination Trajectory** that is built at levels associated with the sector exit coordination for the flight.
	Note: The **Coordination Trajectory**:
	• Supports both lateral and vertical boundary co-ordinations;
	• Can have the origin and end truncated (e.g. at sector boundaries);
	• Is necessary for predicting **encounters** with flights that are co-ordinated with the sector but not yet in communication with that sector.
	Because it is only needed for boundary crossing conditions the **Coordination Trajectory** can have a relatively short prediction horizon; typically up to the point where the flight is assumed by the sector concerned.
TRACT Trajectory	A **Trajectory** that is derived from the **Planned Trajectory.** It is similar to the **Planned Sequence Trajectory** in that it follows the vertical and lateral profile of the Planned Trajectory, truncated in time to an adaptable parameter (which is suitable for the TRACT process) and **uncertainty** is included.
	Note: It is used in support of the TRACT CD/R process.
Initial Reference Business Trajectory	The representation of an airspace user's intention with respect to a given flight, guaranteeing the best outcome for this flight (as seen from the airspace user's

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[2] It may be possible for the lateral profile of Coordination Trajectories to be altered from that of the Planning Trajectory to take into account relevant Coordination Constraints applied at the boundary between two sectors.

(iRBT for Step 1)	perspective), respecting momentary and permanent constraints. The *Reference Business Trajectory* (RBT) refers to the Business Trajectory during the execution phase of the flight. It is the Business Trajectory which the airspace user agrees to fly and the Air Navigation Service Providers (ANSP) and Airports agree to facilitate (subject to separation provision) Note: The iRBT is the Step 1 attempt to move towards the full SESAR Reference Business Trajectory.
Trajectory revision	A trajectory revision is launched when there is a need for human intervention to change the route and/or altitude/ Flight Level and/or time features (Targets and/or Constraints), It is mostly triggered at Controller or Flight Crew initiative but it may also be initiated by other ground actors. However, trajectory revisions can only be implemented by ATCOs and the Flight Crew.
Trajectory update	A trajectory update implies an Air-Ground and/or Ground-Ground trajectory distribution. The trajectory update is triggered automatically, on request or periodically. A trajectory update is automatically triggered when the trajectory predictions continuously computed by the ground and/or aircraft system(s), differs from the previously shared trajectory predictions by more than a defined threshold
Clearance and Instruction Related Terms	
CTO	An ATM imposed time constraint over a point [SESAR lexicon]. Note: This constraint is sent by the ground system to the aircraft.
CTA	An ATM imposed time constraint on a defined merging point associated to an arrival runway [SESAR lexicon]. Note: This constraint is sent by the ground system to the aircraft.
RTA	A function of the airborne FMS that allows the flight to comply with a CTA/CTO.
Active CTO/CTA/RTA	A *CTO* or *CTA* or *RTA* that is currently taken into account by both, the avionics (e.g. FMS) and the Ground Systems. Note: It is considered to be active from the moment when both the air and the Ground Systems have taken it into account, until the application point of the constraint is over-flown or until it is cancelled in the Air and the Ground systems.
Target Time of Arrival	An Arrival Time which is not a constraint but a progressively refined planning time that is used to coordinate between arrival and departure management applications. It is an ATM computed time.
Open loop Instruction/Clearance	An ATC clearance or instruction where a full trajectory extrapolation beyond the point or segment(s) affected is not possible using the normal prediction process, i.e. without special measures to assert a closure condition (e.g. time limit on headings and most probable point of return to original routing). Open loop instructions/clearances can be cancelled by a Closed-loop instruction/clearance. Note: Most tactical instructions/clearances take this form; they include heading (including track offset), level, and speed restrictions and exceptionally could also cover rates of climb or descent.
Closed loop Instruction/Clearance	An ATC clearance or instruction where a full trajectory extrapolation beyond the point or segment(s) affected is possible using the normal prediction process. Note: A typical example is a direct route from one point to another on the original route.

NFL, SFL	The NFL is the cleared level that the aircraft will have when it will arrive in the sector. The NFL is given by the upstream sector. The NFL is equal to the XFL of the upstream sector.
	The SFL is the second level that permits to determine the interval of flight levels in which the aircraft will arrive in the sector. So when arriving in the sector the aircraft will be between the SFL and the NFL.
Data-Link Related Terms	
ETA	Estimated Time of Arrival. The ETA is usually used not only for the arrival (i.e. last point of the Trajectory) but also for the "arrival" on any given trajectory point. In such a case and for Ground systems use only the acronym ETO – Estimated Time Over – should be preferred. In the current document, it is used in Air aspects (e.g. as an item of EPP data) only, although Ground systems namely Ground TP may use this acronym too.
TOAC	Time Of Arrival Control - the function of airborne system providing automatic speed control as to overfly given point on trajectory within given time constraint.
reliable RTA interval	The range of arrival times at a specified lateral fix which are achievable using TOAC function, with a level of confidence of 95% assuming standard meteorological uncertainty as specified in appendix J of WG85 - addendum to document ED75, and margins. This corresponds to the raw [ETAmin,max] amended with margins, and it is downlinked in the ADS-C messages as "ETAmin,max" field.
RTA Tolerance	Time tolerance around CTO/CTA/RTA constrained point defined by ATC in which airborne system overfly this point with 95% probability.
Other Terms	
Eligible flight for TRACT	A flight to which the TRACT service may send a CTO
I4D equipped aircraft	An aircraft with capabilities that support the initial 4D trajectory operations step 1
User Preferred Route	A preferred route that is provided by an Airspace User during the flight planning and agreement phase. In Step 1 it may take advantage from *Free Route Airspace (FRA)* for optimum routings.
	Note: A User Preferred Route may include published as well as non-published points defined in latitude/longitude or point bearing/distance. Such waypoints are inserted in the FMS for trajectory computation
Level Block	A level or a range of levels that is blocked off to other traffic, e.g. crossers

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355   The following table identifies terms that may be used in the current OSED but introduced by other
356   SESAR projects or other European programs.

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358

Terms referenced elsewhere in SESAR	
4DTRAD	Eurocontrol 4DTRAD Concept of Operation
Performance Based Navigation (PBN) **Advanced RNP (A-RNP)** **Area navigation (RNAV)**	P04.07.03

ASAS (Airborne Separation Assistance System)	P04.07.06
MSP[3] (Multi Sector Planning) and EAP (Extended ATC Planner/Planning)	P04.07.08
Complexity Complexity Management	P04.02 DOD, P07.02 DOD, P04.07.01
Free Route, Free Routing, Free Route Airspace (FRA)	P04.02 DOD, P07.05.03
Flexible Use of Airspace (FUA)	P07.05.02
Functional Airspace Block (FAB)	www.eurocontrol.int/articles/functional-airspace-blocks-fabs-and-single-european-sky-ses
Queue Management	P05.06, P07.02

359

360 The following terms are not defined in 04.07.02 OSED deliverable, but are necessary to write this
361 Technical Specification (TS) document.

Tactical Deviation Encounter	A specific instance of a Tactical Encounter which is predicted using Tactical Deviation Trajectory: the Figure 6 in the glossary copied from 04.07.02 OSED is precised with the Figure 8. 10.04.01 Technical Specification adopts a more precise encounter naming convention compared to the 04.07.02 OSED, in order to clarify the requirements by use of unique encounter names.
Tactical Deviation Trajectory	The Tactical Trajectory of a flight in deviation.
Tactical Nominal Encounter	A specific instance of a Tactical Encounter which is predicted between two Tactical Trajectories: the Figure 6 in the glossary copied from 04.07.02 OSED is precised with the Figure 8. 10.04.01 Technical Specification adopts a more precise encounter naming convention compared to the 04.07.02 OSED, in order to clarify the requirements by use of unique encounter names.

		Subject Flight		
		Tactical Traj.	Deviation Traj.	Entry Traj.
Environmental Flight	Tactical Traj.	**Tactical Nominal Encounter**	Tactical Deviation Encounter	--
	Deviation Traj.	Tactical Deviation Encounter	Tactical Deviation Encounter	--
	Entry Traj.	--	--	Coordination Encounter

Figure 8: Tactical Aircraft vs. Aircraft Encounters.

362

363 ## 1.9 Acronyms and Terminology

364

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[3] MSP concept is currently addressed by project P04.07.08 and covers both "MSP" approach (adopted by NATS) and "EAP" approach (adopted by DSNA)

Term	Definition
ACC	Area Control Centre
ADAP	Adaptation Database
ADD	Architecture Definition Document
ADS-B	Automatic Dependent Surveillance-Broadcast
ADS-C	Automatic Dependent Surveillance-Contract
AGDS	Air-Ground Datalink Services (Functional Block)
ANSP	Air Navigation Service Provider
AOI	Area of Interest
AOR	Area of Responsibility
APP	Approach
ARES	Airspace Reservation
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
ATSU	Air Traffic Services Unit
CD&R	Conflict Detection & Resolution
CFL	Cleared (Current) Flight Level
CHMI	Controller Human Machine Interaction Management (Functional Block)
CONF	Conflict Mgt (Functional Block)
COTR	Co-ordination and Transfer
CPDLC	Controller Pilot Data Link Communication
CTA	Control Time of Arrival
CTO	Control Time Over
CWP	Controller Working Position
DOD	Detailed Operational Description
E-ATMS	European Air Traffic Management System

Term	Definition
EPP	Extended Projected Profile
ER	En-Route
ETA	Estimated Time of Arrival
ETO	Estimated Time Over
FL	Flight Level
FMS	Flight Management System
FRA	Free-Routing Airspace
HDG	Heading
HMI	Human-Machine Interface
INTEROP	Interoperability Requirements
iRBT	Initial Reference Business Trajectory
IRS	Interface Requirements Specification
MONA	Monitoring Aids (Functional Block)
MSAW	Minimum Safe Altitude Warning
MSP	Multi Sector Planning
MTCD	Medium-Term Conflict Detection
NFL	eNtry Flight Level
OSED	Operational Service and Environment Definition
PC	Planning Controller
RBT	Reference Business Trajectory
RTA	Requested Time of Arrival
RVSM	Reduced Vertical Separation Minimum
SAR	Safety Assessment Report
SESAR	Single European Sky ATM Research Programme
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
SFL	Supplementary Flight Level

Term	Definition
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
SOI	Separation Of Interest
SPO	Single Person Operation
SPR	Safety and Performance Requirements
SSR	Secondary Surveillance Radar
STCA	Short-Term Conflict Alert
TAD	Technical Architecture Description
TC	Tactical Controller
TFL	Transfer Flight Level
TMA	Terminal Manoeuvring Area
TOAC	Time Of Arrival Control
TP	Trajectory Prediction
TP&M	Trajectory Prediction & Management (Functional Block)
TRA	Temporary Reserved Airspace
TRACT	TRajectory Adjustment through Constraint of Time
TS	Technical Specification
TSA	Temporary Segregated Area
VFR	Visual Flight Rules
WILCO	Will Comply
XFL	Exit Flight Level

365

366   # 2   General Functional block Description

367   **Note**: although the current Separation Management concept includes three Separation Services for
368   completeness, the Planning Conflict Detection ("CD/R aid to the PC") and the Solver Service
369   ("TRACT") are out of the SESAR Solution #27 because they have not yet reached V3 maturity.
370   Related to Solution #32 and #33 only PCP requirements, labelled as shall in the OSED and SPR, are
371   considered as input.

372

373   ## 2.1 Context

374
375   The following figure gives an overview of the role of the Conflict Management Functional Block. The
376   information about each functional sub-block is detailed in section 2.6.1. The Functional Blocks other
377   than those in interface with Conflict Management Functional Block are shown here for information.

378
379
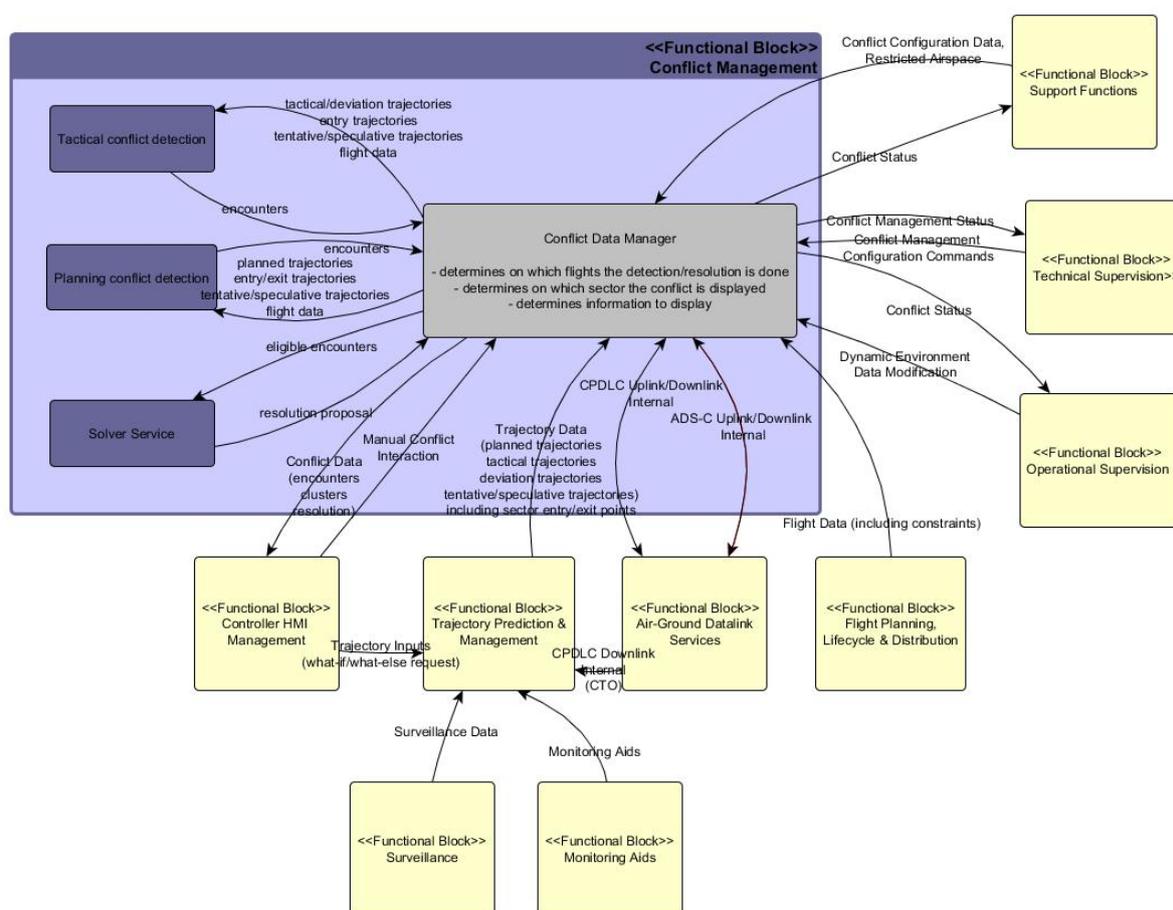
380   Figure 9 : Conflict Management Functional Block

381   ## 2.2 Functional block Modes and States

382   The en-route concept that is presented in the 04.07.02 OSED [14], specifies that the local
383   environment may require the implementation of only one or several of the three system separation
384   services for a particular sector (area of responsibility). It is important to tailor to the local environment
385   considering the complexity and performance requirements of that particular sector. The TRACT is not
386   implemented on a particular sector, but has an ACC wide scope.

387

388 The TMA concept described in the 05.07.02 OSED [16] , includes relevant requirements on the
389 Conflict Detection and Resolution Aid to Planning Controller (CD&R Aid to PC) and the Conflict
390 Detection and Resolution Aid to Tactical Controller (CD&R Aid to TC). TRACT is not considered
391 relevant for TMA operations.

392

393 Requirements included in Chapter 3 of this document cover the interactions between the separation
394 services when multiple services are implemented in the same sector.

395

396 Each separation service is either fully available or fully unavailable, i.e. there are no degraded modes.
397 Note that a service may be unavailable to a particular user if the user does not satisfy the eligibility
398 requirements that are described in Chapter 3 (typically if the ground systems are missing critical data
399 associated with the user).

2.3 Major Functional block Capabilities

401 As shown in the functional block diagram in Figure 9, the "Conflict Management" block has been
402 divided into 4 lower level functional sub-blocks:

403   1. Conflict Data Manager
404   2. Tactical Conflict Detection
405   3. Planning Conflict Detection
406   4. Solver Service

407

2.4 User Characteristics

409 The primary users of the Conflict Management functionality are the ATCOs. A detailed breakdown of
410 the users and the description of use are provided in Table 4 below, and its content has been derived
411 from the 04.07.02 OSED [14]. One can argue that all users will be "indirect users" of all the new
412 CD&R functionality as they ultimately benefit from the reduction in workload even if the encounter
413 solution does not require their direct involvement. Note that Table 4 is intended to illustrate only the
414 primary users for each of the main functions. Also, the figure does not correctly reflect the data
415 transmission into and out of the Conflict Management functional block, as all communication occurs
416 through the Conflict Data Manager sub-block.

417

Functional sub-block	User(s)	Description of use
Conflict Data Manager	Planning Controller (PC) Tactical Controller (TC) Multi-Sector Planners	The ATCOs use the Conflict Data Manager functionality to track the latest status of all conflicts, those that are resolved automatically by the system, those that have already been solved by the PC or TC and those that still need to be resolved. The Conflict Data Manager block relies on the ATCOs to manually input any new clearances in order to maintain an up-to-date status.

Tactical Conflict Detection	Tactical Controller (TC)	The TC(s) uses the Tactical Conflict Detection functionality to search for potential conflicts between eligible aircraft within the sector. Planning of solutions is now supported by what-if and what-else probing.
Planning Conflict Detection	Planner Controller (PC)	The PC(s) uses the Planning Conflict Detection functionality to search for potential conflicts between eligible aircraft whose planning trajectory intersects the sector. Planning of solutions is now supported by what-if and what-else probing.
	Multi-Sector Planners	The Multi-Sector Planners uses the Planning Conflict Detection functionality to search for potential conflicts between eligible aircraft whose planning trajectory intersects the MSP area. Planning of solutions is now supported by what-if and what-else probing.
Solver Service	Aircrew	If a CTO update is required to achieve a TRACT solution, the aircrew will receive a new CTO requests from the ATC system. The aircrew will need to assess the request, answer the CPDLC messages related to the suggested CTO (accept, reject, standby), and update the FMS with the new CTO.

418   Table 4: Description of the users of the Conflict Management functional sub-blocks.

2.5 Operational Scenarios

420 Operational scenarios that illustrate the use of the CD&R functionality are included in Chapter 5 of the
421 04.07.02 OSED [14] and the 05.07.02 OSED [16] .

2.6 Functional

2.6.1 Functional decomposition

424 The **Conflict Data Manager** block covers eligibility requirements, high-level criteria that are common
425 to all three separation services, specific requirements to distribution and display of data, requirements
426 to the interaction between the different services as well as the functional block interface requirements

427 The **Planning Conflict Detection** block covers the CD&R Aid to PC service which uses the planning
428 related trajectories for conflict search with a conflict horizon of 25 minutes.

429 The **Tactical Conflict Detection** block covers the CD&R Aid to TC service which uses the tactical
430 related trajectories (that take into account tactical instructions) for conflict search with a conflict
431 horizon of 8 minutes.

432 Both the Tactical Conflict Detection block and the Planning Conflict Detection block include the
433 following capabilities:

434 •   The detection and notification to the controller(s) of probable loss of the required separation of
435   interest between two aircraft

436   • The detection and notification to the controller(s) of aircraft penetrating or plan to penetrate
437   segregated or otherwise restricted airspace

438   • What-If probing that enables controllers to check if a clearance would cause a potential conflict

439   • What-Else probing that shows the conflict status for a wide range of possible clearances

440   The **Solver Service** block covers the Automated System Separation services, which for Step 1 scope
441   is limited to TRajectory Adjustment through Constraint of Time (TRACT).
442

2.6.2 Functional analysis

444   See 2.6.1.

2.7 Service View

446   No service has been defined for step 1.

3 Functional block Functional and non-Functional Requirements

> **Note**: although the current Separation Management concept includes three Separation Services for completeness, the Planning Conflict Detection ("CD/R aid to the PC") and the Solver Service ("TRACT") are out of the SESAR Solution #27 because they have not yet reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the OSED and SPR, are considered as input.

3.1 Capabilities

This section describes the capabilities of the Conflict Management function.

3.1.1 Conflict Data Manager

This section presents the requirements allocated to the Conflict Data Manager functional sub-block defined for SESAR Step 1.

3.1.1.1 Adaptation Data Management

Adaptation data are offline defined parameters provided by the "Support Functions" functional block. The data are generally used to configure a given system to a particular operational environment.

[REQ]

Identifier	REQ-10.04.01-TS-0001.0001
Requirement	The Conflict Management functional block shall verify that all the adaptation data relevant for CD&R processing is in accordance with the formats and types expressed in the ADAP Database.
Title	Adaptation Data Verification
Status	<Validated>
Rationale	It is necessary to verify the Adaptation Data. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.1007	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

469   [REQ]

Identifier	REQ-10.04.01-TS-0001.0003
Requirement	The Conflict Management functional block shall verify that the complete area within the ATSU AOI is covered by TC-Aid volumes including the exclusion volumes.
Title	TC-Aid volumes coverage
Status	<Validated>
Rationale	It is necessary to cover the whole AOI with the TC-Aid volumes. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

470

471   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.03-OSED- MMSP.0003	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

472

473   [REQ]

Identifier	REQ-10.04.01-TS-0001.0050
Requirement	The Conflict Management functional block shall verify that the complete area within the ATSU AOI is covered by PC-Aid volumes including the exclusion volumes.
Title	PC-Aid volumes coverage
Status	<In Progress>
Rationale	It is necessary to cover the whole AOI with the PC-Aid volumes. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

474

475   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MDET.0001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0015	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-DR04.0225	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

476

477 ## 3.1.1.2 Eligibility Requirements

478 Encounter Detection processing applies to flights satisfying defined criteria. The CD&R processing
479 aims at finding all possible encounters of all types and at managing them.
480
481 [REQ]

Identifier	REQ-10.04.01-TS-0001.0004
Requirement	The PC-Aid shall provide CD&R services for each flight which has a valid planning trajectory.
Title	PC-Aid trajectory assessment criteria
Status	<In Progress>
Rationale	A valid planning trajectory for a particular flight is needed in order to predict encounters for that flight. (Note that this technical requirement addresses only the CD&R scope of the OSED requirement, and does not include the actual trajectory generation which is P10.02.01 scope.) This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

482
483 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2011	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0001	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

484
485 [REQ]

Identifier	REQ-10.04.01-TS-0001.0005
Requirement	The Conflict Management functional block shall provide CD&R services for an aircraft if one of the following is true: 1. The planned trajectory of the aircraft passes through the sector AOI 2. The aircraft is manually selected.
Title	CD&R coordination service availability
Status	<Validated>
Rationale	A basic requirement for the proposed CD&R concept that limits the CD&R service to the relevant flights. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>

Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

486

487   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157-yy	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0001.2007	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0002.2012	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0002.2013	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MDET.0001	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MNOT.0001	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-SPR-CDR1.1010	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0110.0010	\<Partial\>
\<ALLOCATED_TO\>	\<Functional block\>	CONF	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

488

489   [REQ]

Identifier	REQ-10.04.01-TS-0001.0007
Requirement	The TC-Aid shall provide CD&R services for each flight which has a valid tactical trajectory.
Title	Availability of the Tactical Trajectory
Status	\<Validated\>
Rationale	A valid tactical trajectory for a particular flight is needed in order to predict tactical encounters for that flight. Note that this technical requirement addresses only the CD&R scope of the OSED requirement, and does not include the actual trajectory generation which is P10.02.01 scope. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	\<Functional\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

490

491   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0001.2007	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-SPR-CDR1.1050	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0100.0090	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0100.0100	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0130.0110	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-SPR-DRTC.1002	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-SPR-FRTC.1003	\<Full\>
\<ALLOCATED_TO\>	\<Functional block\>	CONF	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

492

493   [REQ]

Identifier	REQ-10.04.01-TS-0001.0009
Requirement	The Conflict Management functional block shall provide an eligible controller with the online capability to manually remove a flight from CD&R processing.
Title	Manual flight eligibility removal
Status	\<In Progress\>
Rationale	The controller(s) should be able to remove nuisance/non-relevant flights from CD&R processing.

	This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

494
495   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MDET.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0110.0010	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

496
497   [REQ]

Identifier	REQ-10.04.01-TS-0001.0051
Requirement	The Conflict Management functional block shall provide an eligible controller with the online capability to add a previously manually removed flight to CD&R processing.
Title	Manual flight eligibility updates
Status	<In Progress>
Rationale	This requirement allows us to undo the action specified by REQ-10.04.01-TS-0001.0009. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

498
499   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MDET.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0110.0010	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

500
501   [REQ]

Identifier	REQ-10.04.01-TS-0001.0047
Requirement	The Conflict Management functional block shall allow the exclusion of flights from CD&R processing based on offline criteria which can include one or more of the following: - Flight rule - Flight type - Aircraft type - Call sign - SSR codes - Flight phase

	- Departure airport	
Title	Flight exclusion for Encounter Detection	
Status	<In Progress>	
Rationale	Allowing exclusion of flights from CD&R processing based on offline criteria, increases flexibility and adaptation to different operational contexts. *Note: A trajectory may be deemed incomplete if position and/or mode C are not known (This issue is open), in which case the flight is automatically discarded from eligibility.* This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)	
Category	<Functional>	
Verification Method	<Test>	
Validation Method	<Real Time Simulation>	

502

503   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0200	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

504

505   [REQ]

Identifier	REQ-10.04.01-TS-0001.0010
Requirement	All correlated flights with a planned trajectory shall be eligible for solver services.
Title	Eligibility criteria for solver services
Status	<In Progress>
Rationale	Solver services are available to flights with a predictable behaviour. Note that solver service TRACT can be used to solve encounters involving aircraft not equipped with Initial-4D, as long as the solving instructions can be applied to the equipped aircraft(s) involved in the encounter.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

506

507   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2017	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

508

509   [REQ]

Identifier	REQ-10.04.01-TS-0001.0011
Requirement	The Conflict Management functional block shall exclude from TRACT processing the encounters for which the geometry is head-on.
Title	Solver Service Eligibility Filter
Status	<In Progress>
Rationale	The TRACT service to filter out encounters that are out of scope.
Category	<Functional>
Verification Method	<Test>

Validation Method	<Real Time Simulation>

510

511   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3080	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

512

513   [REQ]

Identifier	REQ-10.04.01-TS-0001.0053
Requirement	The Conflict Management functional block shall provide the capability to manually exclude an encounter from solver services.
Title	Manual encounter eligibility for solver service
Status	<In Progress>
Rationale	The TRACT shall not solve encounters that have a responsible operator.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

514

515   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.3071	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

516

3.1.1.3 Encounter Detection Volumes, Separation criteria and Inhibition Areas

519

520   Encounters detection processing is performed inside pre-defined volumes where the separation
521   criteria can be independently specified according to the operational environment. Additionally,
522   encounter detection can be locally inhibited in exclusion volumes. The definition of these airspace
523   volumes by default intends to be separated from the AOR & AOI volumetric sectors. However it
524   should be possible to match these volumes with the sectors AOI, if needed for operational purposes.
525   For instance, a CD&R area can be defined as the AOI of a particular flow of traffic from En-Route to
526   upper TMA, all managed by a single multi-sector planner. This concept may be further specified for
527   later releases of this document.

528

529   [REQ]

Identifier	REQ-10.04.01-TS-0001.0012
Requirement	The Conflict Management functional block shall provide the capability to configure different lateral and vertical separation of interest parameters and trajectory look-ahead horizon for different airspace volumes.
Title	Separation of interest parameters per type of airspace
Status	<Validated>
Rationale	This may reflect military areas, holding volumes or certain parts of a sector for which other separation minima apply. For planning conflict detection, a possible choice of parameters could be a trajectory look-ahead horizon starting from the end of tactical conflict detection horizon, and up to at least 15 minutes.

This requirement has been implemented in project prototypes used in the following validation exercises: |

	• EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
	• EXE-04.07.02-VP-500 (V2, Planning Conflict Detection)
	• EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

530

531 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3035	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4062	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4012	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1460	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1480	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1490	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0250	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

532

533 [REQ]

Identifier	REQ-10.04.01-TS-0001.0013
Requirement	The Conflict Management functional block shall perform encounter detection for pairs of flights within a configurable trajectory look-ahead horizon for all the eligible trajectories based on the following defined separation of interest criteria: - Lateral separation of interest - Vertical separation of interest - Vertical separation of interest in RVSM region for RVSM-equipped flights
Title	Encounter Detection scope
Status	<Validated>
Rationale	Proximity between flights is computed considering the separation criteria. Note that the separation of interest is always greater than or equal to the separation minima. Also, a lower vertical separation of interest can be used in RVSM regions, but only for RVSM-equipped flights. Note that REQ-05.07.02-OSED-MSEP.1001 defines four additional separation of interest criteria: - Minimum route separation - Significant turn threshold - Established on route distance - Parallel trajectory tolerance According to project 05.07.02, the specifics are still under study and clarification must be provided at a later point in time. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)

Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

534

535   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2007	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2035	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3027	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3028	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1050	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1060	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1050	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

536

537   [REQ]

Identifier	REQ-10.04.01-TS-0001.0014
Requirement	The Conflict Management functional block shall discard a detected encounter between a pair of aircraft once the required vertical and horizontal separation of interest parameters have been achieved.
Title	Encounter removal
Status	<Validated>
Rationale	Ensure attentions are focused on current encounters. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

538

539   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0019	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

540

541   [REQ]

Identifier	REQ-10.04.01-TS-0001.0015
Requirement	The Conflict Management functional block shall provide the capability to add dynamic trajectory uncertainty to the separation of interest parameters in

	order to allow the uncertainty to grow in each dimension with increasing look-ahead time.
Title	Encounter detection dependant on trajectory uncertainty
Status	<Validated>
Rationale	Whether or not showing a conflict is useful depends on its uncertainty. There may be some cases where it is useful that the uncertainty varies as a function of remaining time to conflict. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

542
543   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

544
545   [REQ]

Identifier	REQ-10.04.01-TS-0001.0016
Requirement	The Conflict Management functional block shall provide the capability to define different separation of interest parameters depending on tactical or planned trajectory information used for the detection of an encounter.
Title	Separation of interest parameters according to flight phase
Status	<Validated>
Rationale	Requirement derived from REQ-10.04.01-TS-0001.0015. A possible implementation of this requirement is to output the uncertainty as a discrete and standardised number that correspond to fixed separation values, for each segment of the trajectory. CD&R would choose the appropriate separation of interest parameter according to the standardised uncertainty defined for each segment of the trajectory. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

546
547   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-MCAN.1001	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

548

549   [REQ]

Identifier	REQ-10.04.01-TS-0001.0055
Requirement	The Conflict Management functional block shall provide the capability to configure different lateral and vertical separation parameters depending on the aircraft equipment.
Title	Thresholds depending on aircraft equipment
Status	<In Progress>
Rationale	Depending on the capability of equipment onboard the aircraft, it may be necessary/appropriate to use different separation parameters than the nominal values specified for the sector.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

550

551   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4061	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3120	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4058	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3121	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

552

553   [REQ]

Identifier	REQ-10.04.01-TS-0001.0058
Requirement	The Conflict Management functional block shall provide the capability to configure different look-ahead horizon depending on the flight phase.
Title	Look-ahead horizon depending on flight phase
Status	<In Progress>
Rationale	Different look-ahead horizon may apply between approach phase and en-route phase.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

554

555   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3125	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

556

557   [REQ]

Identifier	REQ-10.04.01-TS-0001.0019
Requirement	The Conflict Management functional block shall provide the capability to

	define vertical bands with separation of interest parameters different than the nominal values used for the sector (but not less than the separation minima) in order to optimize the benefit of the separation tools.
Title	Vertical separation of interest parameters and RVSM
Status	<Validated>
Rationale	It may sometimes be useful/needed to apply different separation of interest variables. Examples of use cases includes: 1. The definition of a vertical separation of interest specifically for RVSM equipped flights in RVSM regions The definition of increased/reduced vertical separation of interest for airspace where high climb rates can be expected. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

558
559   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3120	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4058	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3121	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0250	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

560
561   [REQ]

Identifier	REQ-10.04.01-TS-0001.0020
Requirement	For non-RVSM-approved aircraft operating in RVSM airspace, the non-RVSM separation of interest (vertical separation of interest static parameter) shall have precedence over airspace volume defaults.
Title	Vertical separation of interest for non-RVSM approved aircraft.
Status	<Validated>
Rationale	Ensures that non-RVSM separation of interest applies to aircraft flying in RVSM airspace that are not RVSM approved. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>

Verification Method	<Test>
Validation Method	<Real Time Simulation>

562

563   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3120	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4058	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3121	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

564

565   [REQ]

Identifier	REQ-10.04.01-TS-0001.0022
Requirement	The Conflict Management functional block shall provide the capability to exclude Airspace volumes from Encounter Detection.
Title	Encounter detection inhibition areas
Status	<Validated>
Rationale	Enable adaptation of CD&R processing according to airspace patterns. A typical example is to define an area around an approach where CD&R processing is not used. This requirement has been implemented in project prototypes used in the following validation exercises: - EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) - EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) - EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

566

567   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4051	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0005	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0210	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

568

569   [REQ]

Identifier	REQ-10.04.01-TS-0001.0052
Requirement	The Conflict Management functional block shall prevent intermittent termination of encounters due to trajectory fluctuations. The smoothing mechanism will apply to longitudinal, lateral and vertical separations, using a pre-defined variation around the separation criteria.
Title	Encounter Smoothing.
Status	<In Progress>
Rationale	A smoothing mechanism will apply to avoid fast conflict changes. It is also applicable to prevent spurious changes in the encounters classification. This requirement has been implemented in project prototypes used in the following validation exercises: EXE-04.07.02-VP-500 (V2, Planning Conflict Detection)

	• EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection)
	• EXE-05.07.02-VP-741 (V2, Planning Conflict Detection)
	• EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
	• EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

570

571   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0018	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0019	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0280	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

572

3.1.1.4 Distribution and Display

573

574   The system shall distribute to relevant sector controller positions (e.g. planner and tactical controller
575   positions) the encounters on which the sector has the responsibility to act at defined times before the
576   start of the encounter. There is a tailored distribution for executive and planner roles, according to the
577   types of encounters and the timeline.

578   Airspace under the same area of responsibility is referred to as a *sector*. The sectors can be grouped
579   together to larger airspace entities during periods of low traffic, and split apart again when the traffic
580   increases.

581   Encounters include flight plans that are in the AOI of the sector, so they are displayed to the
582   corresponding controllers, possibly including flight plans that are in the AOI sector but do not cross
583   the AOR sector.

584   [REQ]

Identifier	REQ-10.04.01-TS-0001.0024
Requirement	The Conflict Management functional block shall provide information for display to the user through a graphical HMI.
Title	Graphical HMI requirement
Status	<Validated>
Rationale	This high-level requirement is included here for clarity purposes. The requirements about information to be provided by CONF to CHMI are detailed in each section 3.1.2.4, 3.1.3.5, 3.1.4.3. The requirements about information to be displayed by CHMI are detailed in section 3.1.5. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>

Verification Method	<Test>
Validation Method	<Real Time Simulation>

585

586 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

587

588 [REQ]

Identifier	REQ-10.04.01-TS-0001.0056
Requirement	The Conflict Management functional block shall handle all the interactions that are relevant for encounter management coming from CHMI.
Title	Graphical HMI Interface requirement
Status	<In Progress>
Rationale	CONF scope to support CHMI functions related to encounter distribution, encounter responsibility, encounter display, encounter acknowledgement, point-out and similar will be detailed in a future TS update These functions depend on the chosen system architecture (centralized vs. decentralized). While some system designs may require implementing a portion of these functions in the CONF functional block, other solutions may allow the functions to be fully implemented in the CHMI functional block.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

589

590 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-MNOT.0004	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-MNOT.0005	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-MNOT.0006	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-MNOT.0020	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-MACK.0001	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

591

592 [REQ]

Identifier	REQ-10.04.01-TS-0001.0025
Requirement	When the Conflict Management functional block provides a CD&R service, it shall be available for every CWP.
Title	CD&R service availability
Status	<Validated>
Rationale	It is necessary to cover all the AOI with the available CD&R services. Activation of the service depends on local ATCO decision. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection)

• EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)	
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

593

594   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.1002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1340	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1400	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0030	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

595

596   [REQ]

Identifier	REQ-10.04.01-TS-0001.0026
Requirement	The Conflict Management functional block shall allow to enable and to disable the display of CD&R Services for Planner Controller and for Tactical Controller on each CWP which is "CD&R equipped".
Title	CD&R service enable/disable capability
Status	<In Progress>
Rationale	It is necessary to provide the capability to switch on or off the TC-Aid and/or PC-Aid on each CWP. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

597

598   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1350	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0020	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

599

600 [REQ]

Identifier	REQ-10.04.01-TS-0001.0027
Requirement	For a given CD&R tool, the Conflict Management functional block shall make the same output available to all controllers of a given sector team.
Title	Sector team input data
Status	<Validated>
Rationale	If for instance the TC uses the PC-Aid from the TC position, s/he should get access to the same information as the PC gets when using the PC-Aid at the PC position. Note that the detailed HMI/display requirements (such as zoom factor etc.) are outside of 10.04.01 scope. This requirement has been implemented in project prototypes used in the following validation exercises:
	• EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
	• EXE-04.07.02-VP-500 (V2, Planning Conflict Detection)
	• EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection)
	• EXE-05.07.02-VP-741 (V2, Planning Conflict Detection)
	• EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
	• EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
	• EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

601

602 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2023	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1340	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1400	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

603

604 [REQ]

Identifier	REQ-10.04.01-TS-0001.0028
Requirement	The Conflict Management functional block shall provide CD&R services for adapted controller organizations.
Title	Controller Team capability for CD&R services
Status	<Validated>
Rationale	The CD&R services must support different controller organizations, for example single-sector planner, multi-sector planner (MSP) or single person operations (SPO). This requirement has been implemented in project prototypes used in the following validation exercises:
	• EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
	• EXE-04.07.02-VP-500 (V2, Planning Conflict Detection)
	• EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection)
	• EXE-05.07.02-VP-741 (V2, Planning Conflict Detection)
	• EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
	• EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

605

606 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3042	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0220	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

607

608 [REQ]

Identifier	REQ-10.04.01-TS-0001.0029
Requirement	The Conflict Management functional block shall provide at least one of the following services in an En-Route ACC: - CD&R for the Tactical Controller (TC-Aid) - CD&R for the Planner Controller (PC-Aid) - Solver Service (TRACT)
Title	Minimum Service Availability
Status	<Validated>
Rationale	Depending on the environment, some services are necessary whereas some are not (e.g. TRACT provides the most benefit when most aircraft are in cruise but can do little when most aircraft are in climb/descent). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

609

610 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0000.0001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.1003	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

611

612 [REQ]

Identifier	REQ-10.04.01-TS-0001.0057
Requirement	The Conflict Management functional block shall provide, in a TMA ACC, CD&R for the Tactical Controller (TC-Aid).
Title	Minimum Service Availability
Status	<In Progress>
Rationale	Tactical Controller Tool is mandatory in TMA environment.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

613
614   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0000.0010	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

615
616   [REQ]

Identifier	REQ-10.04.01-TS-0001.0030
Requirement	If more than one encounter of a given type is detected between the same aircraft pair, the Conflict Management functional block shall output to HMI/display only the encounter that is the soonest to occur.
Title	Display of multiple encounters for the same aircraft pair
Status	<In Progress>
Rationale	Only the first encounter of a given type should be displayed as it is assumed that secondary encounters will disappear as soon as the first (in time) encounter has been solved. Here "type of encounter" refers to an encounter between either two tactical trajectories (tactical encounter) or two planning trajectories (planning encounter). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

617
618   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

619
620   [REQ]

Identifier	REQ-10.04.01-TS-0001.0035
Requirement	If an aircraft is excluded for some or all types of CD&R processing, then the Conflict Management functional block shall identify to the controller which service(s) that is/are unavailable for that aircraft.
Title	Indication of CD&R processing for Flights
Status	<In Progress>
Rationale	Excluded CD&R services should be indicated to make it possible to determine what type(s) of conflict search that is performed for a particular aircraft.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

621
622   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.3071	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MDET.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

623

3.1.1.5 Interactions between Services

625

626 This section includes requirements that relate to the interaction between the different services
627 provided by the Conflict Management functional block.

628

629 [REQ]

Identifier	REQ-10.04.01-TS-0001.0042
Requirement	Every CD&R service shall output coherent information to the sector team.
Title	Coherent output from CD&R services.
Status	<In Progress>
Rationale	Coherent CD&R information is needed for proper PC and TC cooperation. The PC also functions as an assistant TC, so both controllers have to be provided with coherent data. This requirement should be further detailed following the validation exercises and the reception of additional operational input. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

630

631 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.1005	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

632

633 [REQ]

Identifier	REQ-10.04.01-TS-0001.0049
Requirement	The PC-Aid (respectively the TC-Aid) service shall distinguish between the encounters that it has detected and those that have been solved by the TRACT.
Title	Coordination within different roles
Status	<In Progress>
Rationale	It is essential that the controller can easily identify the TRACT solutions. The details are part of HMI/display scope, but to apply a "tag" to flights involved in a TRACT solution would be one option.
Category	<Functional>

Verification Method	<Test>
Validation Method	<Real Time Simulation>

634

635   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2025	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

636

3.1.2 Tactical Conflict Detection

3.1.2.1 Aircraft to aircraft encounter

3.1.2.1.1 Encounter Detection

640   [REQ]

Identifier	REQ-10.04.01-TS-0002.0007
Requirement	The TC-Aid shall provide tactical encounter detection on that part of the trajectory which falls within the centre AOI as laid down in the environmental data (static data).
Title	TC-Aid trajectory truncated.
Status	<Validated>
Rationale	Only the part of the trajectory inside the AOI will be used for conflict search. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Review of Design><Inspection>
Validation Method	<Real Time Simulation>

641

642   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1050	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1060	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.03-OSED- MMSP.0003	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0030	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0100	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

643

644   [REQ]

Identifier	REQ-10.04.01-TS-0002.0008
Requirement	The TC-Aid shall use uncertainty information from a trajectory for any position, this being expressed in terms of lateral, longitudinal and vertical uncertainty to a given confidence level to declare a tactical encounter.
Title	TC-Aid uses uncertainty.
Status	<Validated>
Rationale	The TC-Aid will search the conflicts based on the trajectories uncertainty. This requirement has been implemented in project prototypes used in the

	following validation exercises:
	• EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Inspection>
Validation Method	<Real Time Simulation>

645

646 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3094	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3101	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1080	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

647 ### 3.1.2.1.1.1 Candidate Trajectories

648 [REQ]

Identifier	REQ-10.04.01-TS-0002.0010
Requirement	The TC-Aid shall perform encounter detection when a tactical trajectory or deviation trajectory or entry trajectory is created, updated or deleted.
Title	TC-Aid activation when trajectory list is modified.
Status	<Validated>
Rationale	When the trajectory list is modified (a new trajectory appears, a trajectory is modified or a trajectory is removed) the conflict calculation must be performed. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Inspection>
Validation Method	<Real Time Simulation>

649

650 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2005	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2007	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1050	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1130	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1060	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1120	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0180	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0100	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0270	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DRTC.1004	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

651

652 [REQ]

Identifier	REQ-10.04.01-TS-0002.0011
Requirement	TC-Aid shall compare tactical, deviation and entry trajectories of a flight with tactical, deviation and entry trajectories of all other flights, except in any of the following cases: • Pairs of deviation trajectories derived from intruder VFR flights.

	• Entry trajectories entering different executive CWPs.
Title	Used trajectories crossings.
Status	<Validated>
Rationale	Specifies the trajectory crossings that are used to search for conflicts. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

653

654 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2007	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4041	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1050	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

655

3.1.2.1.1.2 Encounter Calculation

656

657 [REQ]

Identifier	REQ-10.04.01-TS-0002.0014
Requirement	When comparing two points of two trajectories, if different separation criteria are applicable, the TC-Aid shall use the most severe criteria.
Title	Most severe criteria is used.
Status	<Validated>
Rationale	Sets the rule for separation criteria when more than one is available. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

658

659 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3035	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3120	<Partial>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

660

661 [REQ]

Identifier	REQ-10.04.01-TS-0002.0016
Requirement	TC-Aid shall declare a tactical encounter for a pair of flights if the uncertainty volumes around the predicted aircraft positions are separated by less than the applicable separation of interest within a configurable look-ahead time.
Title	Tactical Encounter detection definition.
Status	<Validated>
Rationale	Defines a tactical encounter for a pair of flights when the separation of interest criterion is not fulfilled. This encounter detection is applied to every class:

	Tactical Nominal Encounter, Tactical Deviation Encounter and Coordination Encounter (as defined in Encounter Classification section and shown in figure 5). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

662
663   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3041	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3094	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3027	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3028	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2035	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3102	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3130	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1060	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1080	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0210	<Full>
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<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

664

3.1.2.1.2 Encounter Classification

666   [REQ]

Identifier	REQ-10.04.01-TS-0002.0059
Requirement	TC-Aid shall classify as Coordination Encounter every detected tactical encounter obtained by comparing the entry trajectory of the subject flight with any entry trajectory of the environmental flight.
Title	Coordination Encounter definition.
Status	<In Progress>
Rationale	A Coordination Encounter is generated comparing, the entry trajectory of the subject flight with the entry trajectory of the environmental flight.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

667
668   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2007	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2035	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3130	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4041	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0220	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0310	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

669
670 [REQ]

Identifier	REQ-10.04.01-TS-0002.0060
Requirement	TC-Aid shall classify as Tactical Deviation Encounter every detected tactical encounter obtained by comparing deviation trajectories (of the subject flight or the environmental flights) with tactical or deviation trajectories.
Title	Tactical Deviation Encounter definition.
Status	<In Progress>
Rationale	A Tactical Deviation Encounter is generated by comparing the deviation trajectory of the subject flight with the Tactical or the Deviation Trajectory of another flight. Detection of the Tactical Deviation Encounter is symmetrical.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

671
672 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2007	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0220	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0310	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

673
674 [REQ]

Identifier	REQ-10.04.01-TS-0002.0064
Requirement	TC-Aid shall classify as Tactical Nominal Encounter every detected tactical encounter obtained by comparing two tactical trajectories.
Title	Tactical Nominal Encounter definition.
Status	<In Progress>
Rationale	A Tactical Nominal Encounter is generated by comparing two Tactical Trajectories.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

675
676 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2007	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0220	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0310	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

677
678 [REQ]

Identifier	REQ-10.04.01-TS-0002.0017
Requirement	TC-Aid shall classify a tactical encounter according to the proximity of the predicted aircraft positions at the Closest Point of Approach (CPA) and the uncertainty surrounding those positions.
Title	Levels of infringement.
Status	<Validated>
Rationale	This requirement classifies the levels of infringement in case of a tactical

	encounter, however the particular conditions for each one are an implementation issue and they are not described. As an example of severity levels, the following four levels may be used: Conflicting, Potential Conflict, Not Assured and Assured (from higher to lower severity). Classification (according to severity) described in this requirement is independent of the classification defined according the involved trajectories. Note: The classification of a tactical encounter according to the involved trajectories is: • A tactical nominal encounter is a tactical encounter detected between the Tactical Trajectories. • A tactical deviation encounter is a tactical encounter detected between two Deviation Trajectories or between a Tactical and a Deviation Trajectory. A coordination encounter is detected between the Entry Trajectory of a flight plan and the entry trajectory of other flight This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

679

680   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1002.BIS	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0220	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

681

682   [REQ]

Identifier	REQ-10.04.01-TS-0002.0030
Requirement	For each detected tactical encounter, TC-Aid shall calculate an encounter identity, the identity of flights involved, the class of trajectories involved, the closest approach distance, and the time and nominal position of: • Loss of separation of interest • Loss of Assured Separation • Closest point of Approach • Regaining of Assured Separation • Regaining of separation of interest.
Title	Tactical Encounter Calculated Data.
Status	<Validated>
Rationale	This requirement specifies the data to be provided for each tactical encounter. "Assured Separation" is defined in the 05.07.02 OSED [16] and refers to the point at which the separation minima (legal separation) are infringed. The time of loss of Assured Separation and/or the time of Closest point of Approach can be used to define urgency of encounters. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Analysis><Test>
Validation Method	<Real Time Simulation>

683

684   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3104	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1003	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1090	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0220	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0230	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0320	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1130	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

685
686   [REQ]

Identifier	REQ-10.04.01-TS-0002.0031
Requirement	For each detected tactical encounter, the TC-Aid shall determine the geometry of the encounter, as either head-on, crossing, catch-up or not applicable.
Title	Tactical Encounter Geometry.
Status	<Validated>
Rationale	This requirement specifies the encounter horizontal geometry in 2D in order to provide to the controller an overview of the encounter. The "not applicable" geometry will be assigned to encounters when at least one of the interacting aircraft's predictions has no defined direction of flight, for example when being in a hold volume. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Analysis><Test>
Validation Method	<Real Time Simulation>

687
688   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3104	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1003	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1004	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0220	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0320	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

689
690   [REQ]

Identifier	REQ-10.04.01-TS-0002.0033
Requirement	The TC-Aid shall calculate whether a tactical encounter would occur on the climb or descent profile of the aircraft, or whether it would occur only if the aircraft were to level off at the affected level.
Title	Vertical attitude determination of a Tactical Encounter.
Status	<Validated>
Rationale	This specifies the aircraft vertical attitude (level, climb or descend) for the flights involved in a tactical encounter. This requirement has been implemented in project prototypes used in the following validation exercises:

• EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)	
Category	\<Functional\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

691

692   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MCLA.1005	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0150.0220	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0150.0320	\<Full\>
\<ALLOCATED_TO\>	\<Functional block\>	CONF	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

693

3.1.2.2 Aircraft to Airspace encounter detection

695   [REQ]

Identifier	REQ-10.04.01-TS-0002.0041
Requirement	TC-Aid shall detect tactical encounters for all flights whose tactical and deviation trajectories cross an offline defined airspace volume (e.g. TSA), upon the activation of this airspace volume.
Title	Aircraft-to-airspace Warning.
Status	\<In Progress\>
Rationale	If an airspace is crossed due to an entered clearance/probe a warning is raised to the controlling CWP about this issue.
Category	\<Functional\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

696

697   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0001.3032	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0150.0100	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0150.0110	\<Partial\>
\<ALLOCATED_TO\>	\<Functional block\>	CONF	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

698

699   [REQ]

Identifier	REQ-10.04.01-TS-0002.0044
Requirement	TC-Aid shall remove all tactical encounters (if any) associated with an offline defined airspace volume, upon the deactivation of this airspace volume.
Title	Notification when an airspace deactivates.
Status	\<In Progress\>
Rationale	When an airspace is deactivated, all associated tactical encounters should be removed.
Category	\<Functional\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

700

701   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	ER_ATC_157	\<Full\>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3032	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

702

3.1.2.3 What-if/what-else

3.1.2.3.1 What-if

705   This section describes the What-if function for the tactical operator provided by the TC-Aid.

706

707   [REQ]

Identifier	REQ-10.04.01-TS-0002.0048
Requirement	The TC-Aid shall allow the tactical operator to probe for tactical encounters detection of a tactical clearance or a coordination proposal before applying it to the flight plan.
Title	What-if is allowed
Status	<Validated>
Rationale	The controller is allowed to perform a probe before applying a tactical command. A tentative trajectory will be calculated by the TP&M with the tactical clearance or the coordination proposal to be probed. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Inspection><Test>
Validation Method	<Real Time Simulation>

708

709   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1006	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0115	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0600	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1180	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

710

711   [REQ]

Identifier	REQ-10.04.01-TS-0002.0050
Requirement	When a what-if is proposed for a flight, the TC-Aid shall probe that flight's tentative trajectory against all other flights' tactical and deviation trajectories, and against all active TSAs.
Title	What-if is probed against all the trajectories and active TSAs.
Status	<Validated>
Rationale	The what-if probes against all the real flights (note that this excludes the other what-if flights) in order to find the impact of a command before the command is performed. Tentative encounters are tactical encounters that involve Tentative Trajectories (generated by a What-if probe) and Tactical or Deviation Trajectories for other flights. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)

Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

712

713   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1200	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1205	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

714

715   [REQ]

Identifier	REQ-10.04.01-TS-0002.0051
Requirement	The TC-Aid shall provide the result of the what-if probe to the requesting CWP including the resulting tentative encounters differentiated from the other encounters.
Title	What-if is marked to the controller.
Status	<Validated>
Rationale	The what-if probes are marked to the controller to allow the distinction between the real trajectories and the tentative ones. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

716

717   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1003	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0120	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1210	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

718

719   [REQ]

Identifier	REQ-10.04.01-TS-0002.0058
Requirement	TC-Aid shall perform Tactical What-if probes for any flight having tactical trajectory upon request by any CWP.
Title	Allowed flights for What-if.
Status	<Validated>
Rationale	The What-if can be performed for every tactical trajectory in order to probe a command. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>

Validation Method	<Real Time Simulation>

720

721   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1002	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

722

3.1.2.3.2 What-else

724   This section describes the What-else function for the tactical operator provided by the TC-Aid.

725

726   [REQ]

Identifier	REQ-10.04.01-TS-0002.0052
Requirement	The TC-Aid shall calculate What-else probes for every eligible flights using the speculative trajectories provided by the TP&M.
Title	What-else functionality.
Status	<Validated>
Rationale	What-else functionality will generate speculative trajectories in order to supply this information immediately to the controller when requested. An eligible flight is a flight correlated and assumed by any controller. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Review of Design><Analysis>
Validation Method	<Real Time Simulation>

727

728   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2005	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3106	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1004	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1290	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0130	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0710	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1240	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

729

730   [REQ]

Identifier	REQ-10.04.01-TS-0002.0053
Requirement	The TC-Aid shall use speculative trajectories against all other trajectories for What-else probing, excluding all speculative and tentative trajectories, and against all active TSAs.
Title	Speculative Trajectories used for What-else probing.
Status	<Validated>
Rationale	For what-else probing for a flight plan the TC-Aid will use the speculative trajectories against Tactical, Deviation and Entry trajectories of other flight plans. This requirement has been implemented in project prototypes used in the

	following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

731

732   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3106	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2036	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0720	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1245	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

733

734   [REQ]

Identifier	REQ-10.04.01-TS-0002.0055

Requirement	For each What-else probe the TC Aid shall provide the following data as response to a controller request:
	    1) Flight level probes:
	        a) level is conflict free;
	        b) level is blocked;
	        c) level can only be reached if a vertical rate is provided.
	    2) In case of 1c) the TC-Aid indicates conflict free vertical rates.
	    3) Route clearance, including Direct Route or 2D RNP routes, and heading probes:
	        a) Route or heading is conflict free;
	        b) Route or heading is not conflict free.

Title	What-else probe data.
Status	<Validated>
Rationale	Establish the data to be provided due to a What-else probe. This functionality should be provided to the controller with a minimum delay time. This can be achieved using a fast calculation algorithm or cyclically performing the calculation for every flight. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

735

736   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4009	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1290	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1320	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1330	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1005	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0700	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0720	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1250	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A

| <ALLOCATED TO> | <Project> | 10.04.01 | N/A |

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3.1.2.4 HMI

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740
The requirements in this section are allocated to the CONF Functional Block, so that it provides relevant information for display.

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The requirements allocated to CHMI Functional Block that displays the information provided by CONF Functional Block are in section 3.1.5 (CWP requirements).

743
[REQ]

Identifier	REQ-10.04.01-TS-0002.0045
Requirement	As soon as a tactical encounter is detected, updated or deleted the TC-Aid shall update all CWPs with the related encounter data.
Title	Encounter Distribution.
Status	<Validated>
Rationale	The encounter information is distributed in broadcast to all CWPs. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

744
745
[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1007	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1090	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0220	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1070	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

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[REQ]

Identifier	REQ-10.04.01-TS-0002.0065
Requirement	The TC-Aid shall provide the tactical encounter for display in the sectors crossed by any part of the trajectories included in the encounter, provided that the local management rules are met.
Title	Sector responsibility for tactical encounters
Status	<In Progress>
Rationale	The tactical encounter information should be displayed in the relevant sector, i.e. the first sector that may realistically resolve the conflict.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

748
749
[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3037	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3129	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1009	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1070	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0260	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1080	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1100	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

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3.1.3 Planning Conflict Detection

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Note: although the current Separation Management concept includes three Separation Services for completeness, the Planning Conflict Detection ("CD/R aid to the PC") is out of the SESAR Solution #27 because it has not yet reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the OSED and SPR, are considered as input.

756

3.1.3.1 General

758   [REQ]

Identifier	REQ-10.04.01-TS-0003.0063
Requirement	PC-Aid shall allow to enable CD&R Services within all airspace whose boundaries are defined by a geographical area and upper and lower levels.
Title	Airspace where PC-Aid Service is applied
Status	<In Progress>
Rationale	CD&R services should be possible to enable in all types of airspace where the airspace is defined by geographical areas and upper and lower levels and may not be the same throughout the whole sector. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

759
760   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3041	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-DR04.0220	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-FR04.0220	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-FR04.0225	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DRPC.0107	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DRPC.1005	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DRPC.1006	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FRPC.0107	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FRPC.1004	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FRPC.1005	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FRPC.1006	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

761

762 ## 3.1.3.2 Aircraft to aircraft encounter

763 [REQ]

Identifier	REQ-10.04.01-TS-0003.0064
Requirement	PC-Aid shall allow to apply different separation of interest for different volumes of airspace.
Title	Separation of interest depending on airspace
Status	<In Progress>
Rationale	Different airspace volumes may require that a different separation of interest is used to compute encounters. Volumes of airspace refers to sectors whose boundaries are defined by geographical area and upper and lower levels (which may not be the same throughout the whole sector). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

764
765 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4012	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

766
767 [REQ]

Identifier	REQ-10.04.01-TS-0003.0013
Requirement	PC-Aid shall declare a planning encounter for a pair of flights, if uncertainties around the predicted aircraft positions are separated by less than the separation of interest in the longitudinal, lateral and vertical axis.
Title	Planning Encounter Detection
Status	<In Progress>>
Rationale	Uncertainties refer to applicable uncertainty volume around the predicted aircraft position(s). PC-Aid will take into account the off-line/fixed uncertainties depending on the particular flight phase (climb, descent or cruise) of the flights involved in the encounter. PC-Aid will take into account also different uncertainties depending on the navigational capabilities of the flights involved in the encounter. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

768
769 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3052	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1050	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A

| <ALLOCATED_TO> | <Project> | 10.04.01 | N/A |

770

771   [REQ]

Identifier	REQ-10.04.01-TS-0003.0070
Requirement	PC-Aid shall not declare a planning encounter if the loss of separation between uncertainties around the predicted aircraft positions occurs along ATC routes previously defined as separated in the environmental data.
Title	Separated Routes
Status	<Validated>
Rationale	Along predefined separated routes the PC-Aid has to ignore separation infringement. This exception is not applicable if the flights are traveling along the same ATC route. This requirement has been implemented in project prototypes used in the following validation exercises: EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

772

773   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0016	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

774

775   3.1.3.2.1 Candidate Trajectories

776   [REQ]

Identifier	REQ-10.04.01-TS-0003.0004
Requirement	PC-Aid shall process the following trajectories provided by Trajectory Prediction and Management: - Planned Sequence Trajectories - Coordination Trajectories - Speculative Trajectories - Tentative Trajectories
Title	PC-Aid Used Trajectories
Status	<In Progress>
Rationale	PC-Aid must be able to process all trajectories which can be involved in planning encounters. Coordination trajectories are associated to flights which are coordinated into and out of the sector, therefore, if PC-Aid can process coordination trajectories, it means that it is able to provide CD&R services for aircraft as they are coordinated into or out of the sector. Tentative trajectories reflect what-if flight data selected by the controller. Speculative trajectories reflect flight data other than those committed or tentatively selected by the controller (they are produced for the purpose of what-else probing). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)

	• EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

777

778   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2012	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3047	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3049	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1060	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1230	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1140	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1150	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1050	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

779

780   [REQ]

Identifier	REQ-10.04.01-TS-0003.0005
Requirement	PC-Aid shall detect planning encounters comparing • either planned sequence trajectories of the flights; • or coordination trajectories of the flights.
Title	Planning encounters detection
Status	<In Progress>
Rationale	The planning encounters are generated by comparing the specific trajectories of the subject flight and the environmental flights. The characterization of the trajectories is made on the basis of operational concepts provided by the operative project. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

781

782   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3047	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0001	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

783

784   [REQ]

Identifier	REQ-10.04.01-TS-0003.0057
Requirement	For a subject flight, the PC-Aid shall allow, on demand, to assess and make

	available for display, context trajectories of the involved flights.
Title	Candidate trajectories
Status	<In Progress>
Rationale	The PC-Aid must be able to make context trajectories for involved flights available for display. Context flights are flights not currently involved in an encounter with the subject flight based on their current clearance or existing coordinated levels but which may need to be considered by the planner when making coordination choices. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

785
786   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2038	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3110	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4047	<Partial>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

787
788   [REQ]

Identifier	REQ-10.04.01-TS-0003.0060
Requirement	For a subject flight, PC-Aid shall allow to assess context trajectories of environmental flights which will be built for each standard flight level where the flight is expected to fly in the considered planning sector.
Title	Context trajectory
Status	<In Progress>
Rationale	The PC-Aid must be able to make context trajectories for environmental flights available for display. Each flight may have several context trajectories spanning a range of levels. This range of levels represents flights anticipated utilisation of airspace in the sector (i.e. all likely levels at which the flight is expected to fly). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

789
790   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4046	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A

| <ALLOCATED TO> | <Project> | 10.04.01 | N/A |

791

3.1.3.2.2 Encounter Classification

793 [REQ]

Identifier	REQ-10.04.01-TS-0003.0008
Requirement	PC-Aid shall classify an encounter according to the - proximity - geometry - uncertainty of the predicted aircraft positions.
Title	Encounter classification
Status	<In Progress>
Rationale	To help prioritize the encounters they are classified according to the proximity, geometry and uncertainty of the aircraft positions involved. Proximity is intended as separation minima. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

794

795 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3052	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1520	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

796

797 [REQ]

Identifier	REQ-10.04.01-TS-0003.0012
Requirement	PC-Aid shall classify an encounter according to mutual directions of flights distinguishing into: • crossing • head-on • converging • catch-up
Title	PC-Aid Encounter Geometry
Status	<In Progress>
Rationale	This requirement specifies the way to distinguish different geometries for an encounter on the base of the mutual directions of the flights involved. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

798

799　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3052	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1530	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FRPC.1007	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

800

3.1.3.2.3 Coordination

802　[REQ]

Identifier	REQ-10.04.01-TS-0003.0034
Requirement	PC-Aid shall allow the planning controller to review encounters related to a subject flight.
Title	Coordination within different sectors
Status	<In Progress>
Rationale	The PC-Aid to enable a planning controller encounters review which is typically done for a flight before setting and agreeing to its entry/exit coordination contracts with neighbouring sectors. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

803

804　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3058	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1010	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

805

806　[REQ]

Identifier	REQ-10.04.01-TS-0003.0035
Requirement	On the receipt of an offer of entry coordination (from an offering sector) the PC-Aid shall allow the planning controller to assess the acceptability of that offer in a context with other flights notified to the sector.
Title	Coordination acceptability within different sectors
Status	<In Progress>
Rationale	PC-Aid shall support planning controller in assessing the suitability of sector entry and exit condition for a flight reviewing the encounters related to that flight. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)

Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

807

808   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3058	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

809

3.1.3.3 Aircraft to airspace encounter

811   [REQ]

Identifier	REQ-10.04.01-TS-0003.0017
Requirement	PC-Aid shall detect an Aircraft-to-Airspace encounter • within an off-line defined time horizon • depending on the activity schedule of the Temporary Segregated Area (TSA) or Airspace Reservation (ARES) • depending on Holding Volumes.
Title	Aircraft to airspace encounter calculation
Status	<In Progress>
Rationale	PC-Aid to provide encounter detection between aircraft and different kinds of airspace volumes. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

812

813   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3047	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MEXC.0001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0021	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-FR04.0227	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

814

815   [REQ]

Identifier	REQ-10.04.01-TS-0003.0018
Requirement	Upon the activation and/or timetable changes of a TSA, PC-Aid shall detect encounters for all flights whose planning trajectories cross the TSA.
Title	Aircraft to airspace encounter calculation
Status	<In Progress>
Rationale	To detect all encounters, PC-Aid must support aircraft to airspace encounter detection for all relevant flights upon TSA activation. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)

Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

816

817 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3047	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0021	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

818

819 [REQ]

Identifier	REQ-10.04.01-TS-0003.0019
Requirement	Upon the deactivation of a TSA, PC-Aid shall remove all encounters associated with the TSA (if any).
Title	Aircraft to airspace encounter calculation
Status	<In Progress>
Rationale	The PC-Aid to remove all relevant aircraft to airspace encounters upon TSA de-activation. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

820

821 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3047	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0021	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

822

823 [REQ]

Identifier	REQ-10.04.01-TS-0003.0020
Requirement	PC-Aid shall detect holding volume infringement when the planning trajectory of a flight crosses or passes within a defined distance from an active holding volume
Title	Aircraft to holding volume encounter calculation
Status	<In Progress>
Rationale	PC-Aid to support encounter detection between aircraft and airspace volumes (holding areas or TRA). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

824

825 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3047	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MEXC.0001	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

826   ### 3.1.3.4 What-if/What-else

827   ### 3.1.3.4.1 What-if

828   This section describes the What-if function for the planning operator provided by the PC-Aid.

829   [REQ]

Identifier	REQ-10.04.01-TS-0003.0039
Requirement	PC-Aid shall detect tentative encounters between planning and tentative trajectories
Title	Tentative Trajectory
Status	<In Progress>
Rationale	In order to support What-if functionality, the PC-Aid conflict search must include the tentative trajectories. The tentative trajectory is the one created from another trajectory which is in operative use (tactical or planning) that supports what-if probing. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

830
831   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3120	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.0001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1030	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1035	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1040	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

832
833   [REQ]

Identifier	REQ-10.04.01-TS-0003.0040
Requirement	When a controller applies a What-If probe to a particular flight, PC-Aid shall use the tentative trajectory of this flight for encounter detection computations
Title	Tentative Trajectory
Status	<In Progress>
Rationale	The tentative trajectory for a flight subject to conflict search must be used in the encounter detection algorithms. In the sectors different from the one where the what-if probe is assessed PC-Aid will always take into account the planning trajectory associated with the flight.

	This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

834
835   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3120	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.0001	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

836
837   [REQ]

Identifier	REQ-10.04.01-TS-0003.0072
Requirement	When a controller discards a What-if probe for a particular flight, PC-Aid shall remove the tentative encounters associated with the What-if probe
Title	Removal of Encounters for Discarded What-if Probes
Status	<In Progress>
Rationale	Depending on the detailed implementation of the What-If Probe, it may be necessary to remove the associated conflicts from the system (a database or similar) if the What-if probe is discarded. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

838
839   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1070	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1210	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

840
841   [REQ]

Identifier	REQ-10.04.01-TS-0003.0073
Requirement	When a controller applies a What-if probe for a particular flight, PC-Aid shall support the display of: a) The tentative trajectory of the subject flight b) The planning trajectories of any flights that form a tentative encounter with the subject flight within an offline defined number of seconds.
Title	Allowable Delay of the Display of What-if Probe Results

Status	<In Progress>
Rationale	The result of the What-if probe to be displayed within a maximum allowable delay. Project 04.07.02 still needs to specify the allowable delay "x".
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

842

843   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1300	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

844

3.1.3.4.2 What-else

846   This section describes the What-else function for the planning operator provided by the PC-Aid.

847   [REQ]

Identifier	REQ-10.04.01-TS-0003.0041
Requirement	PC-Aid shall detect speculative encounters between planning and speculative trajectories
Title	Speculative Trajectory
Status	<In Progress>
Rationale	In order to support What-else functionality, the PC-Aid conflict search must include the speculative trajectories. Speculative trajectory is the one using the flight data other than those currently committed or tentatively selected by the controller, it supports the what-else probing
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

848

849   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3077	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3049	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

850

851   [REQ]

Identifier	REQ-10.04.01-TS-0003.0042
Requirement	When displaying the speculative trajectories, PC-Aid shall support the controller who is assessing the encounters by taking into account all the speculative trajectories within that sector for the flight for which the probe was made.
Title	Speculative Trajectory
Status	<In Progress>
Rationale	All speculative trajectories for a flight subject to encounter search must be used in the encounter detection algorithms. In the sectors different from the one where the what-else probe is assessed PC-Aid will always take into account the planning trajectory associated with the flight
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

852

853 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3077	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

854
855 [REQ]

Identifier	REQ-10.04.01-TS-0003.0074
Requirement	When a controller applies a What-else probe for a particular flight, PC-Aid shall support the display of: a) One speculative trajectory of the subject flight selected by the controller b) The planning trajectories of any flights that form an encounter with the selected speculative trajectory of subject flight within an offline defined number of seconds.
Title	Allowable Delay of the Display of What-else Probe Results
Status	<In Progress>
Rationale	The result of the What-else probe to be displayed within a maximum allowable delay. Project 04.07.02 still needs to specify the allowable delay "x".
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

856
857 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1300	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

858

859 3.1.3.5 HMI

860 The requirements in this section are allocated to the CONF Functional Block, so that it provides
861 relevant information for display.

862 The requirements allocated to CHMI Functional Block that displays the information provided by CONF
863 Functional Block are in section 3.1.5 (CWP requirements).

864 [REQ]

Identifier	REQ-10.04.01-TS-0003.0065
Requirement	PC-Aid shall support the display of information to the user through a graphical HMI at every PC-Aid equipped workstation.
Title	Display
Status	<In Progress>
Rationale	Display of PC-Aid Service results. Note that individual settings of the PC-Aid tool may be required, particularly of the "Conflict Horizon" parameter. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>

Verification Method	<Test>
Validation Method	<Real Time Simulation>

865

866 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0002	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

867

868 [REQ]

Identifier	REQ-10.04.01-TS-0003.0044
Requirement	For each detected planning encounter, PC-Aid shall provide the following information: • encounter identity • aircraft identifications • time of first infringement of separation criteria between aircraft nominal position • time of end of infringement of separation criteria between aircraft nominal positions • time of minimum distance between aircraft nominal positions • nominal distance between aircraft at time of minimum distance between aircraft • sector(s)/centre(s) where flights are located at minimum separation • encounter geometry • severity classification (an implementation specific combination of some of the parameters listed above)
Title	Planning encounter information display
Status	<In Progress>
Rationale	Display of PC-Aid Service results for detected planning encounters. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

869

870 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0009	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0011	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0012	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1100	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1050	<Full>

<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

871

872　　[REQ]

Identifier	REQ-10.04.01-TS-0003.0071
Requirement	For each pair of flights selected manually, PC-Aid shall provide the following information: • Closest lateral distance between the trajectories; • Vertical separation between the trajectories at closest lateral proximity; • Time to closest separation; • Position of each flight at closest separation; • Sector(s)/centre(s) where flights are located at minimum separation
Title	Manual selection of pair of flights for information display
Status	<Validated>
Rationale	Display of PC-Aid Service results for manually selected pairs of flights. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

873

874　　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MINF.0001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-FR04.0242	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

875

876　　[REQ]

Identifier	REQ-10.04.01-TS-0003.0045
Requirement	PC-Aid shall allow the controller to select a single flight as subject of CD&R presentation and actions.
Title	Single flight display
Status	<In Progress>
Rationale	The controller should be able to make specific flights a target of the CD&R actions. This requirement does not refer to force a manual conflict detection, it just aims to say that the selected flight will become the subject of conflict detection and resolution at the workstation at which the selection is made. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

877

878 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3055	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

879

880 [REQ]

Identifier	REQ-10.04.01-TS-0003.0046
Requirement	PC-Aid shall support the display of planning encounters according to the evolutions they have over time.
Title	Planning encounter monitoring
Status	<In Progress>
Rationale	Encounters may be generated and evolve over time. The PC aid must be able to monitor and display these encounters to the PC in real time. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

881

882 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3059	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0018	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0019	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1020	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1030	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DRPC.1006	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FRPC.1005	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

883

884 [REQ]

Identifier	REQ-10.04.01-TS-0003.0047
Requirement	The PC-Aid shall allow to reassess planning encounters manually or cyclically.
Title	Refreshing
Status	<In Progress>
Rationale	Manual planning encounters reassessment means that reassessment is triggered by a user action. Cyclical planning encounters reassessment means that reassessment occurs when planning encounters information are updated (e.g. latest trajectory information). This is to support the real-time display of planning encounters affecting the current coordinations for aircraft. This requirement has been implemented in project prototypes used in the following validation exercises:

	• EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	\<Functional\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

885

886   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157-yy	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0002.3087	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MNOT.0018	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MNOT.0019	\<Full\>
\<ALLOCATED_TO\>	\<Functional block\>	CONF	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

887

888   [REQ]

Identifier	REQ-10.04.01-TS-0003.0048
Requirement	PC-Aid shall allow to display to the controller the trajectory of a controller-selected flight in the elevation view, together with any aircraft to aircraft encounters and aircraft to airspace encounters in which the flight is involved.
Title	Vertical view
Status	\<In Progress\>
Rationale	PC-Aid to support display of trajectory and encounter data for a controller-selected flight in the elevation view. The presentation of flight trajectories and encounter in the vertical plane corresponds to the vertical view. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	\<Functional\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

889

890   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157-yy	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0002.2015	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-04.07.02-OSED-0002.3056	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MNOT.0013	\<Full\>
\<ALLOCATED_TO\>	\<Functional block\>	CONF	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

891

892   [REQ]

Identifier	REQ-10.04.01-TS-0003.0049
Requirement	PC-Aid shall allow to display to the controller tentative encounters in the elevation view.
Title	Tentative encounter display in elevation view
Status	\<In Progress\>
Rationale	PC-Aid to support tentative encounter display in elevation view. Note that elevation view corresponds to the vertical view.

	This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

893

894 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.0002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1060	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1120	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

895

896 [REQ]

Identifier	REQ-10.04.01-TS-0003.0051
Requirement	PC-Aid shall allow to display to the controller the trajectory of a controller-selected flight on the horizontal plane, together with any aircraft to aircraft encounters and aircraft to airspace encounters in which the flight is involved.
Title	Plan View
Status	<In Progress>
Rationale	PC-Aid to support display of trajectory and encounter data for a controller-selected flight in the horizontal plane. The presentation of flight trajectories and encounter in the horizontal plane corresponds to the plan view; the plan view is simultaneous to the general radar picture. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

897

898 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3057	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

899

900 [REQ]

Identifier	REQ-10.04.01-TS-0003.0062
Requirement	PC-Aid shall allow to display to the controller tentative encounters in the horizontal plane.
Title	Tentative encounter display in horizontal plane
Status	<In Progress>
Rationale	PC-Aid to support tentative encounter display in the horizontal plane. Note that

	the horizontal plane corresponds to the plan view. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

901

902 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3057	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.0002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1060	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

903

904 [REQ]

Identifier	REQ-10.04.01-TS-0003.0056
Requirement	For each subject flight, PC-Aid shall allow to display both horizontal and vertical context traffic, associated with the planning sector.
Title	Context traffic display
Status	<In Progress>
Rationale	Horizontal and vertical traffic is defined by all the planned (and tentative) context flights which may be of interest due to their anticipated vertical and lateral profiles. Context flights are probably not involved in an encounter with the subject flight based on their current clearance or existing coordinated levels but whose vertical and lateral profiles might interfere in planner's coordination choices for the considered planning-sector. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

905

906 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2038	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4048	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0022	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0041	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1340	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A

<ALLOCATED_TO>	<Project>	10.04.01	N/A

907

908   [REQ]

Identifier	REQ-10.04.01-TS-0003.0061
Requirement	PC-Aid shall assess context trajectories starting from the time that flights are targeted for coordination into a planning-sector.
Title	Context trajectories display
Status	<In Progress>
Rationale	Condition for context trajectory. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

909

910   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3109	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1340	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

911

912   [REQ]

Identifier	REQ-10.04.01-TS-0003.0066
Requirement	The "PC aid" shall allow to filter and display encounters only to controller or controllers who have, or will have at a future time, the responsibility to resolve them.
Title	Filtered Encounters
Status	<In Progress>
Rationale	Encounters displayed to responsible actors only. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

913

914   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3051	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3099	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1440	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1500	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1510	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0017	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.03-OSED- MMSP.0008	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A

<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

915

3.1.4 Solver service

917 The term "solver services" is used to name the tools that calculate automatically instructions that
918 resolve planning encounters. The 4.7.2 step 1 scope is limited to TRACT that calculates only CTOs
919 that are automatically uplinked to aircraft, without active ATCO involvement.

920 **Note**: although the current Separation Management concept includes three Separation Services for
921 completeness, the Solver Service ("TRACT") is out of the SESAR Solution #27 because it has not yet
922 reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the
923 OSED and SPR, are considered as input.

924

3.1.4.1 Compute the solution

926 [REQ]

Identifier	REQ-10.04.01-TS-0004.0001
Requirement	The solver services shall perform the resolution processing on a cyclic basis.
Title	Cyclic processing
Status	<In Progress>
Rationale	The cyclic resolution processing of the solver services is necessary to assess the global situation and determine the best solution. The cycle duration shall permit the solution to be actually implemented by the air crew.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

927
928 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2018	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

929
930 [REQ]

Identifier	REQ-10.04.01-TS-0004.0024
Requirement	The solver services shall group encounters into clusters to perform the resolution: encounters that are in the same cluster shall have at least one common flight.
Title	Cluster definition
Status	<In Progress>
Rationale	TRACT service to group the flights that are involved in a TRACT solution into TRACT clusters for the other Separation services to treat them specifically. It is also used to inform the ATCO about the flights currently in a TRACT solution
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

931
932 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3061	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

933
934　　[REQ]

Identifier	REQ-10.04.01-TS-0004.0002
Requirement	The solver services shall compute a list of solving instructions to be applied to controlled flights, in order to solve a maximum number of encounters eligible for resolution without creating any new encounter.
Title	Elaboration of a global solution
Status	<In Progress>
Rationale	The solving instructions must solve as many encounters as possible without generating new ones. The instructions can be CTO, speed, heading, level clearance for example. For TRACT service, the solving instructions are limited to CTO.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

935
936　　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2018	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3061	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

937
938　　[REQ]

Identifier	REQ-10.04.01-TS-0004.0003
Requirement	The solver services shall compute a solution that does not result in time conflicts with the activity schedule of Restricted areas (TSA).
Title	Elaboration of a global solution
Status	<In Progress>
Rationale	The solution provided by the solver services must not impact TSA operations. This may happen when e.g. a flight is slowed down while it was expected to exit a Restricted Area just before its activation.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

939
940　　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.5008	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

941
942　　[REQ]

Identifier	REQ-10.04.01-TS-0004.0004
Requirement	The solver services shall output a solution for a cluster only if it solves all the encounters of the cluster.
Title	No partial solution
Status	<In Progress>
Rationale	Solver services must solve all encounters associated with a particular cluster in order to output the solution. At the time, the scope is limited to

	TRACT; TRACT computes solution for TRACT clusters.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

943

944   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4042	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

945

946   [REQ]

Identifier	REQ-10.04.01-TS-0004.0007
Requirement	The solver services shall output : - the list of solving instructions to be applied to flights - the encounters solved by the global solution.
Title	Information delivered by solver service
Status	<In Progress>
Rationale	For display purposes, solvers services shall output the list of solving instructions and the solved encounters.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

947

948   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2037	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

949

3.1.4.1.1 Compute the solution with CTOs

951   [REQ]

Identifier	REQ-10.04.01-TS-0004.0006
Requirement	The TRACT service shall compute CTOs for the maximum number of aircraft, in order to minimise the impact on any single flight.
Title	Maximum number of CTOs
Status	<In Progress>
Rationale	It is an operational requirement to share the effort among aircraft. Note that it could be technically complex to satisfy this requirement.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

952

953   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4024	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

954

955   [REQ]

Identifier	REQ-10.04.01-TS-0004.0005

Requirement	The TRACT service shall compute CTOs that could be flown using speed value that belongs to an offline defined percentage interval of the actual aircraft speed.
Title	Small speed adjustments
Status	<In Progress>
Rationale	The CTOs shall be flown using small speed adjustments. A typical value of the offline defined interval could be [-5%, +3%].
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

956

957   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.5009	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

958

959   [REQ]

Identifier	REQ-10.04.01-TS-0004.0009
Requirement	The TRACT service shall compute CTOs that belong to the reliable RTA interval of the target point.
Title	Constraints on CTO computation
Status	<In Progress>
Rationale	The TRACT service should use assumptions to take into account FMS behaviour. As an example, here are the assumptions specified in the 4.7.2 OSED: - There is a delay between the sending of a CTO by the TRACT and its implementation in the FMS by the air crew; - The FMS will initially perform a unique speed adjustment to reach the CTO, at the moment when the CTO is implemented and when the aircraft is cruising; - the FMS will adjust in real-time the speed in closed loop in order to reach the CTO with the requested accuracy and tolerance (30sec expected for en-route); - Once the CTO is over, the aircraft will revert back to its normal speed. Note that the implementation could use different assumptions.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

960

961   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.5009	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.5007	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

962

963   [REQ]

Identifier	REQ-10.04.01-TS-0004.0010
Requirement	The TRACT service shall compute a CTO only for flights that can apply an uplinked CTO, i.e.: - the flight is i4D-capable - the flight has currently neither a speed constraint nor any other open-loop constraint

		- the flight has currently no CTO/RTA - the flight has not accepted more than a predefined number of CTO/RTA in the predefined elapsed time - the flight has not refused a CTO for the last offline defined number of minutes.
	Title	Eligible flights for CTO computation
	Status	<In Progress>
	Rationale	These conditions comply with i4D requirement, reflects the higher priority of an on-going ATCO order, permits to avoid disturbing too many times the same aircraft, and avoids proposing again the same CTO immediately after a refusal. Typical values for predefined number (from 4.7.2 OSED): - the flight has not accepted more than 2 CTO/RTA in the last 2 hours - the flight has not refused a CTO for the last 15 minutes.
	Category	<Functional>
	Verification Method	<Test>
	Validation Method	<Real Time Simulation>

964

965   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.5001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.6001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4028	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

966

967   [REQ]

Identifier	REQ-10.04.01-TS-0004.0011
Requirement	The TRACT service shall compute a CTO on a target point that is (in priority): - either an existing point of FMS trajectory - or a point that belongs to the segment between two consecutive points of FMS trajectory.
Title	CTO target point
Status	<In Progress>
Rationale	The target point shall be aligned with the FMS trajectory
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

968

969   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.5005	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

970

971   [REQ]

Identifier	REQ-10.04.01-TS-0004.0012
Requirement	The TRACT service shall compute a CTO on a target point which is the last (in time) point of closest approach for the aircraft inside the involved TRACT cluster.
Title	CTO target point
Status	<In Progress>
Rationale	So the ATCO is sure that once the CTO is over, it is unlikely that the flights

	conflicts again whatever their speed change. Note that the following operational issue has been transferred to 04.07.02 project: as there is no defined speed adjustment strategy for meeting a CTO, there can be no warranty that previous (in time) encounters are actually solved by this CTO.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

972

973   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.5006	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

974

975   [REQ]

Identifier	REQ-10.04.01-TS-0004.0023
Requirement	The TRACT service shall compute CTOs that are in more than a predefined number of minutes.
Title	No interference with TC situation
Status	<In Progress>
Rationale	The TRACT service should not compute CTOs in the TC horizon time. The aim is to avoid disturbing the TC situation awareness.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

976

977   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4053	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

978

979   3.1.4.2 Implement the solution

980   [REQ]

Identifier	REQ-10.04.01-TS-0004.0013
Requirement	The TRACT service shall implement the solving instructions by sending CTOs to the aircraft through datalink service.
Title	Implementation of the TRACT solution
Status	<In Progress>
Rationale	The TRACT service implements the computed solution.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

981

982   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3062	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

983

984   [REQ]

Identifier	REQ-10.04.01-TS-0004.0014
Requirement	The TRACT service shall suspend an aircraft from cluster definition until the reception of WILCO or UNABLE answer from the aircraft.
Title	Waiting for definitive answer from the aircraft
Status	<In Progress>
Rationale	It cannot be assumed whether the trajectory will comply with the CTO or not. This requirement is applicable when waiting for the aircraft answer, but also when there is no answer from the aircraft (time out) or when the answer is different from WILCO or UNABLE (e.g. STANDBY) or when an error message is received from datalink service
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

985
986   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3088	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4026	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4029	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

987
988   [REQ]

Identifier	REQ-10.04.01-TS-0004.0015
Requirement	On reception of UNABLE answer from an aircraft, the TRACT shall consider as unsolved all encounters of the related TRACT cluster.
Title	Cancellation of a solution when a CTO cannot be implemented
Status	<In Progress>
Rationale	The TRACT implements a solution only if it solves all the encounters of the cluster.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

989
990   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3117	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4050	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

991
992   [REQ]

Identifier	REQ-10.04.01-TS-0004.0016
Requirement	On reception of UNABLE answer from an aircraft, the TRACT shall cancel through datalink service all uplinked CTOs of the related TRACT cluster.
Title	Cancellation of CTOs when a CTO cannot be implemented
Status	<In Progress>
Rationale	The TRACT implements a solution only if it solves all the encounters of the cluster.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

993

994 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3115	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

995

996 [REQ]

Identifier	REQ-10.04.01-TS-0004.0027
Requirement	The TRACT shall consider a CTO as invalid if the trajectory data still does not include the CTO a predefined time parameter after reception of WILCO answer from the aircraft.
Title	Cancellation of CTO when not implemented
Status	<In Progress>
Rationale	A CTO becomes invalid if not implemented in the trajectory data.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

997

998 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3085	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

999

1000 [REQ]

Identifier	REQ-10.04.01-TS-0004.0025
Requirement	Once all the CTOs of a cluster are implemented, if a CTO of this cluster becomes invalid, the TRACT shall consider as unsolved the related encounters.
Title	Cancellation of a solution when a CTO becomes invalid
Status	<In Progress>
Rationale	A CTO becomes invalid when cancelled by controller, or "RTA missed" for example, then all related encounters must be considered unsolved.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1001

1002 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3116	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1003

1004 [REQ]

Identifier	REQ-10.04.01-TS-0004.0026
Requirement	Once all the CTOs of a cluster are implemented, if a CTO of this cluster becomes invalid, the TRACT shall cancel through datalink service the uplinked CTOs of aircraft that are only involved in an encounter with this flight.
Title	Cancellation of useless CTO
Status	<In Progress>
Rationale	Useless CTOs must be cancelled when one CTO becomes invalid.

	If the aircraft is involved in one encounter only, then its CTO is automatically removed when the CTO of the other flight is removed. On the other hand if the aircraft is involved in another solved encounter (even if inside the same cluster) then the CTO is left unchanged.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2040	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3116	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

3.1.4.3 HMI

The requirements in this section are allocated to the CONF Functional Block, so that it provides relevant information for display.

The requirements allocated to CHMI Functional Block that displays the information provided by CONF Functional Block are in section 3.1.5 (CWP requirements).

[REQ]

Identifier	REQ-10.04.01-TS-0004.0017
Requirement	The solver services shall support the display of information about the solved encounters.
Title	Information to ATCOs
Status	<In Progress>
Rationale	Display of resolution information
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2019	<Partial>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

[REQ]

Identifier	REQ-10.04.01-TS-0004.0018
Requirement	The solver services shall support the tagging of the flights involved in an encounter solved by the solver services.
Title	Highlight of flights involved in a solved encounter
Status	<In Progress>
Rationale	A flight can be involved in a solved encounter and not be involved in a solving instruction. However, the ATCO must be informed so that s/he can avoid disturbing the resolution.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3107	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1019
1020

[REQ]

Identifier	REQ-10.04.01-TS-0004.0019
Requirement	When the solution of an encounter is cancelled, the solver services shall support the un-tagging of the flights involved in this encounter if they are not involved in another solved encounter.
Title	Un-tagging of flights no longer involved in a solved encounter
Status	<In Progress>
Rationale	Un-tagging of flights involved in cancelled encounters must be supported.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1021
1022

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3108	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2039	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3078	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1023
1024

[REQ]

Identifier	REQ-10.04.01-TS-0004.0020
Requirement	For each solved encounter, the solver services shall support the tagging of the flights involved in a solving instruction computed by the system.
Title	Tagging of flights with solving instruction
Status	<In Progress>
Rationale	Tagging of flights involved in solved encounters must be supported.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1025
1026

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3065	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1027
1028

[REQ]

Identifier	REQ-10.04.01-TS-0004.0021
Requirement	On controller's request, the solver services shall support the display of the solved encounters.
Title	Display of solved encounters
Status	<In Progress>
Rationale	If the controller needs to view the solved encounters, it should be possible to select and view them.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1029
1030

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3066	<Partial>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1031
1032   [REQ]

Identifier	REQ-10.04.01-TS-0004.0022
Requirement	On controller's request, the solver services shall support the display of the solving instruction's attributes for a flight, including: - the solving instruction - the target point - optionally, the duration.
Title	Display of solving instructions
Status	<In Progress>
Rationale	It should be possible to display the solving instruction for a flight if needed. The instruction can be CTO, speed, heading, level clearance for example. For TRACT service, the solving instructions are limited to CTO. The current status of the CTO as specified in the OSED rationale is displayed by HMI.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1033
1034   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3067	<Partial>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1035

3.1.5 CWP requirements

These requirements are allocated to the Controller Human-Machine Interface (CHMI) functional block and have been produced by Project 10.10.02. The requirements cover the detailed presentation of data and features related to the 10.04.01 scope (covered in the remainder of this TS document) to the controllers via displays, audio etc. The requirements are structured in accordance with the 4 lower level functional sub-blocks within CONF; Conflict HMI Manager (section 3.1.5.1), Tactical Conflict HMI (section 3.1.5.2), Planning Conflict HMI (section 3.1.5.3) and Solver Service HMI (section 3.1.5.4).

3.1.5.1 CWP - Conflict HMI Manager

The requirements described in this section cover the detailed presentation (HMI) of data and features described in section 3.1.1.

Note: although the current Separation Management concept includes three Separation Services for completeness, the Planning Conflict Detection ("CD/R aid to the PC") and the Solver Service ("TRACT") are out of the SESAR Solution #27 because they have not reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the OSED and SPR, are considered as input.

3.1.5.1.1 Services Availability

1052   [REQ]

Identifier	REQ-10.04.01-TS-0006.0065
Requirement	The CWP shall have available the PC-Aid regardless of the role assigned to

	that position.
Title	Availability of the PC-aid service in the CWP
Status	<In Progress>
Rationale	Each position has to be able to show the PC-Aid no matter the role it is assigned in that moment to it.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1053

1054   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1400	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.03-OSED- MMSP.0003	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1055

1056   [REQ]

Identifier	REQ-10.04.01-TS-0006.0042
Requirement	The CWP shall allow an eligible operator to enable/disable the PC-Aid function.
Title	Enable/disable PC-Aid service
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0026. The controller has the capability to online enable/disable the PC-Aid function from the CWP. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1057

1058   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1340	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1410	<Partial>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1059

1060   [REQ]

Identifier	REQ-10.04.01-TS-0006.0043
Requirement	The CWP shall allow an eligible operator to enable/disable the TC-Aid function.
Title	Enable/disable TC-Aid service
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0026. The controller has the capability to online enable/disable the TC-Aid function from the CWP.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1061

1062   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0020	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1063
1064   [REQ]

Identifier	REQ-10.04.01-TS-0006.0008
Requirement	Every CWP shall display all the CD&R services that are available and their respective status.
Title	CD&R services availability and status displayed in the CWP
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0024 and REQ-10.04.01-TS-0001.0025. The controller must stay informed of the CD&R services that are available.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1065
1066   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2020	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1330	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1340	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0001	<Partial>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1067

3.1.5.1.2 Flight Eligibility

1068

1069   [REQ]

Identifier	REQ-10.04.01-TS-0006.0001
Requirement	The CWP shall allow to manually select a flight, whose planned trajectory passes through the AOR sector, for CD&R services processing.
Title	CD&R coordination service availability in the CWP
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0005. The ability to select relevant flights for CD&R processing and CWP display is a basic requirement for the proposed CD&R concept. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>

Validation Method	<Real Time Simulation>

1070
1071   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3055	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0017	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1072
1073   [REQ]

Identifier	REQ-10.04.01-TS-0006.0002
Requirement	The CWP shall allow an eligible operator to online manually inhibit display of all or some CD&R Services for a certain flight.
Title	Manual flight eligibility removal
Status	<In Progress>
Rationale	It may be required to inhibit display of CD&R services for a certain flight in order to declutter the screen and/or to remove irrelevant information.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1074
1075   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MDET.1001	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1076
1077   [REQ]

Identifier	REQ-10.04.01-TS-0006.0003
Requirement	The CWP shall allow an eligible operator to online manually un-inhibit display of all or some of the CD&R Services previously inhibited for a certain flight.
Title	Manual flight eligibility updates in the CWP
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0051. It is necessary to allow to reverse the inhibiting the CD&R display of a certain flight.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1078
1079   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MDET.1001	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A

<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1080

1081   [REQ]

Identifier	REQ-10.04.01-TS-0006.0004
Requirement	The CWP shall display an information message or graphic remark or label when a selected aircraft has been excluded from CD&R Service processing according to one or more of the following off-line set criteria: - Flight rule - Flight type - Aircraft type - Callsign - SSR codes - Flight phase - Departure airport
Title	Flight exclusion for Encounter Detection
Status	<In Progress>
Rationale	Identified in the TS in its requirement REQ-10.04.01-TS-0001.0047. For flexibility and adaptation to different operational contexts it is necessary to allow exclusion from CD&R services based on relevant criteria defined offline, and the exclusion must be indicated on the display. *Note: A trajectory may be deemed incomplete if position and/or mode C are not known (This issue is open), in which case the flight is automatically discarded from eligibility.*
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1082

1083   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0200	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1084

1085   [REQ]

Identifier	REQ-10.04.01-TS-0006.0012
Requirement	The CWP shall indicate for each flight the services unavailable for that flight and the services the flight is excluded from.
Title	CWP display of CD&R services processing for Flights
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0035. It should be possible to determine what type(s) of conflict search that is performed for a particular aircraft.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1086

1087   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>

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<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MDET.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1088
1089   [REQ]

Identifier	REQ-10.04.01-TS-0006.0006
Requirement	The CWP shall allow to manually exclude an encounter from solver services.
Title	CWP allowance of manual encounter eligibility for solver service.
Status	<In Progress>
Rationale	REQ-10.04.01-TS-0001.0053. The TRACT is not intended to solve encounters that have a responsible operator.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1090
1091   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3113	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1092

1093   ### 3.1.5.1.3 Encounter display
1094   [REQ]

Identifier	REQ-10.04.01-TS-0006.0047
Requirement	The CWP shall use the same PC-Aid and TC-Aid data for display to a given sector team.
Title	Sector team input data access
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0027. If for instance the TC uses the PC-Aid from the TC position, s/he should get access to the same information as the PC gets when using the PC-Aid at the PC position. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1095
1096   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2023	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A

| <ALLOCATED TO> | <Project> | 10.04.01 | N/A |

1097

1098   [REQ]

Identifier	REQ-10.04.01-TS-0006.0048
Requirement	The CWP shall be able to display, configured by each ATCO, different representations of the same input data to Planning and Tactical controllers depending on the Operational Needs.
Title	Different representations to Planning and Tactical controllers
Status	<In Progress>
Rationale	The tactical and planning controllers can be provided with different representations of the same input data (e.g. depending on the time horizon). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1099

1100   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2024	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1101

1102   [REQ]

Identifier	REQ-10.04.01-TS-0006.0095
Requirement	The CWP shall display an alert when any conflicting trajectories are detected.
Title	Alert display when conflicting trajectories are detected.
Status	<In Progress>
Rationale	In order to capture the controller's attention, the detection of conflicting trajectories should generate an alert that can be either acoustic and/or visual.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1103

1104   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1070	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0270	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1070	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1105

1106   [REQ]

Identifier	REQ-10.04.01-TS-0006.0088
Requirement	The CWP shall display a notification with the related encounter data as soon as an encounter is detected, updated or deleted.
Title	Display a notification when an encounter is detected, updated or deleted.

Status	<Validated>
Rationale	Controller must be alerted to changes to the encounter data in a proper timely manner in order to allow he/she to fully analyse the encounter with all the possible data. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1107

1108 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1007	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0270	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1109

1110 [REQ]

Identifier	REQ-10.04.01-TS-0006.0075
Requirement	The CWP shall display a notification immediately in case the time to the encounter is less than the Conflict Management functional block (CONF) notification-time.
Title	Display an immediate notification if encounter time is less than CONF notification time
Status	<Validated>
Rationale	A notification has to appear in the CWP to highlight that the time until the encounter to occur is less than the CONF notification parameter. CONF notification time is the maximum time in advance for notification of a conflict. When the predicted time to a conflict is shorter than the CONF notification time the conflict shall be displayed to the planner controller. Look-ahead horizon is the time within which the CONF is considering different traffics for conflicts detection. Look-ahead horizon is usually longer or equal to CONF notification time. These parameters should be set by ANSP for a particular scenario. One as much as the other, "notification time" or "look-ahead horizon" could be different for planner and tactical controller. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1111

1112 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1460	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0007	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A

| <ALLOCATED TO> | <Project> | 10.04.01 | N/A |

1113
1114   [REQ]

Identifier	REQ-10.04.01-TS-0006.0074
Requirement	The CWP shall automatically display an encounter to the respective executive controller at parameter time before the encounter start time if this encounter is not solved.
Title	Allow in the CWP to solve an encounter, send to the EC if not done.
Status	<In Progress>
Rationale	If the Planner Controller does not solve an encounter within a minimum time it will be sent to the Executive.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1115
1116   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0006	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1117
1118   [REQ]

Identifier	REQ-10.04.01-TS-0006.0079
Requirement	The CWP shall display a notification for any separation infringements with TSAs (Temporary segregated areas)
Title	Display a notification for infringements with TSAs
Status	<In Progress>
Rationale	Not only between Flights but also it is needed to show infringements against Segregated Areas.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1119
1120   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0021	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1121
1122   [REQ]

Identifier	REQ-10.04.01-TS-0006.0011
Requirement	The CWP shall provide the means to the eligible operators to negotiate the responsibility between sectors for solving encounters supported by PC-Aid and TC-Aid tools.
Title	Negotiation of encounter's responsibility between sectors
Status	<In Progress>
Rationale	The PC-Aid supports communication between the Planner and Tactical Controllers related to the traffic situation.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1123
1124   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3043	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3044	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.1006	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2026	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.3070	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2027	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.4057	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1150	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1125
1126   [REQ]

Identifier	REQ-10.04.01-TS-0006.0049
Requirement	The CWP shall distinguish between the encounters out of responsibility and those that may require the operator's involvement regarding the TC-Aid and PC-Aid in a given sector team.
Title	Encounters' responsibility identification
Status	<In Progress>
Rationale	It is important that the CWP clearly identifies encounters that are outside operator's responsibility, especially in case of encounters that have to be solved by an adjacent sector. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1127
1128   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.3072	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3051	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1129
1130   [REQ]

Identifier	REQ-10.04.01-TS-0006.0076
Requirement	The CWP shall display in a graphical presentation the trajectory data of the flights involved in an encounter.
Title	Display a graph trajectory data
Status	<In Progress>
Rationale	Trajectory data related to the encounter is needed by the controller to assess it.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1131
1132   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0014	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1133

1134   [REQ]

Identifier	REQ-10.04.01-TS-0006.0092
Requirement	The CWP shall display the conflicting trajectories to the controller within <time parameter> of the encounter detection.
Title	Maximum time to display conflicting trajectories
Status	<In Progress>
Rationale	Exceeding a maximum time delay in the display of the conflicting trajectories could put at risk the separation of the flights.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1135

1136   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1110	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1137

1138   [REQ]

Identifier	REQ-10.04.01-TS-0006.0094
Requirement	The CWP shall remove the conflicting trajectories of a subject flight and any interacting environmental flights upon cessation of the interrogation probe of the flight.
Title	Remove coordination trajectories on a cessation of the interrogation probe
Status	<Validated>
Rationale	Remove data that is no longer relevant in order to avoid cluttering the screen and drawing attention away from current encounters. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1139

1140   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1310	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1141

1142   [REQ]

Identifier	REQ-10.04.01-TS-0006.0097
Requirement	The CWP shall display the coordination trajectory of a subject flight together with the trajectories of any environmental flights that are interacting with the

	subject flight on interrogation of a coordination before <a time parameter> seconds.
Title	Time to display coordination trajectories of a subject and its environmental flights when interrogation of a coordination is conducted
Status	<In Progress>
Rationale	CWP must satisfy the necessity of the Controller awareness regarding a Flight and its environment when interrogating a coordination offer not exceeding a time parameter.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1143
1144   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1300	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1145
1146   [REQ]

Identifier	REQ-10.04.01-TS-0006.0058
Requirement	If a flight is involved in a coordination encounter with more than one environmental flight, the CWP shall display the encounters as individual pairs.
Title	Display of the individual pairs of encounters
Status	<Validated>
Rationale	To be better aware of an encounter, the CWP treats encounters as pairs, if more than two aircraft are involved in the same encounter only pairs will be shown. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1147
1148   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1050	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1149
1150   [REQ]

Identifier	REQ-10.04.01-TS-0006.0050
Requirement	If two aircraft are involved in more than one encounter of a given type with each other the CWP shall display only the first encounter to occur.
Title	Encounters' display by urgency
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0030. Only the first encounter to occur is presented to the operator since it is assumed that secondary encounters will disappear as soon as the first (in time) encounter has been solved. This requirement has been implemented in project prototypes used in the

	following validation exercises: • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1151
1152   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1153
1154   [REQ]

Identifier	REQ-10.04.01-TS-0006.0013
Requirement	The CWP shall display the encounters solved by TRACT service in a dedicated way in order to be easily distinguished from the rest of the encounters.
Title	CWP to support coordination within different roles
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0001.0049. It is essential that the controller can easily identify the TRACT solutions, e.g. to apply a "tag" to flights involved in a TRACT solution would be one option.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1155
1156   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.1006	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2025	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1157
1158   [REQ]

Identifier	REQ-10.04.01-TS-0006.0087
Requirement	The CWP shall display in a different/specific way an encounter where a holding flight is involved.
Title	Display differently an encounter with a holding flight
Status	<In Progress>
Rationale	Controller should be able to clearly distinguish an encounter with holding flights. Holding flights must receive extra attention due to their "special" trajectories.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1159
1160   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1420	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1006	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MEXC.0001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0140.0120	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A

<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1161

1162   [REQ]

Identifier	REQ-10.04.01-TS-0006.0089
Requirement	The CWP shall display the context encounters in a different manner than the planning encounters in order to allow the Controller to properly distinguish between them.
Title	Display differently context flights than coordination interactions.
Status	<In Progress>
Rationale	Controller should be able to clearly distinguish between the context flights and the coordination interactions in order to safely provide the service.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1163

1164   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1350	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1165

1166   [REQ]

Identifier	REQ-10.04.01-TS-0006.0067
Requirement	The CWP shall highlight any unusual flights operating within the sector against every probe made using the Conflict Management functional block.
Title	Highlight unusual flights against every CONF probe
Status	<In Progress>
Rationale	Unusual flights have to be highlighted.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1167

1168   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1430	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1169

1170   [REQ]

Identifier	REQ-10.04.01-TS-0006.0086
Requirement	The CWP shall display in a different/specific way, whether an encounter would occur on the climb or descent profile of the aircraft, or whether it would occur only if the aircraft were to level off at the affected level.
Title	Display differently a levelled encounter than an encounter in evolution traffic
Status	<In Progress>
Rationale	Controller should be able to clearly distinguish between encounters occurring levelled-off or in when evolving inside the sector.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1171

1172   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1005	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1173
1174   [REQ]

Identifier	REQ-10.04.01-TS-0006.0071
Requirement	The CWP shall not display to the Planner Controller simultaneously conflict notifications coming from Conflict Management (CONF) and Safety Nets for the same pair of flights. Safety nets conflict notification has priority over CONF ones.
Title	Not display simultaneously CONF and Safety Nets alerts.
Status	<In Progress>
Rationale	In order not to disturb the controllers, notifications from CONF must not be displayed at the same time as notifications from Safety Nets. Safety nets are considered as more important than CONF probes so they will be displayed with priority.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1175
1176   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0003	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1177

1178   ### 3.1.5.1.4 What-if/what-else

1179   [REQ]

Identifier	REQ-10.04.01-TS-0006.0016
Requirement	The CWP shall display an encounter detected in a What-If-Probing in a different way than those detected using just operationally valid flight plans.
Title	CWP to clearly identify encounters detected using What-if probes
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0002.0051. The what-if probes are displayed in a different manner to allow the controller the correct distinction between the real trajectories and the tentative ones. CWP, when performing a what-if, need to display tentative interactions and other interactions in a different manner, so that the controllers can distinguish them properly and not provoke any misunderstanding.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1180
1181   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1003	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.0002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0120	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1182
1183   [REQ]

Identifier	REQ-10.04.01-TS-0006.0054
Requirement	CWP shall remove the tentative encounters associated with the What-if probe, when a controller discards a What-if probe for the selected flight.
Title	Remove tentative encounters when discarding a what-if probe
Status	<Validated>
Rationale	Related to REQ-10.04.01-TS-0003.0072. Data associated with a discarded What-if probe must be removed from display to avoid stealing attention away from current encounters/probes. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1184
1185   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1070	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1186
1187   [REQ]

Identifier	REQ-10.04.01-TS-0006.0056
Requirement	The CWP shall provide the result of the what-else probe function, displaying the speculative encounters in a different way from the other encounters detected for the planning and tactical trajectories.
Title	Display differently what-else speculative encounters than other encounters.
Status	<In Progress>
Rationale	To avoid the misunderstanding of the Controller and to help an easier and faster understanding of the situation, speculative encounters should be displayed differently from planning/tactical encounters.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1188
1189   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1320	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1190

1191   ## 3.1.5.2 CWP - Tactical Conflict HMI

1192   The requirements described in this section cover the detailed presentation (HMI) of data and features
1193   described in section 3.1.2.

1194   ### 3.1.5.2.1 Tactical encounters display

1195
1196   [REQ]

Identifier	REQ-10.04.01-TS-0006.0010
Requirement	The CWP shall display a tactical encounter only if any part of the trajectories included in the encounter is within the sector/sectors volume assigned to that CWP, provided that the local management rules are met.
Title	CWP display of tactical encounters according to Sector responsibility
Status	<In Progress>
Rationale	For more information refer to REQ-10.04.01-TS-0002.0065 rationale.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1197
1198   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3037	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3129	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1070	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1008	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0260	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1080	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1100	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1199
1200   [REQ]

Identifier	REQ-10.04.01-TS-0006.0084
Requirement	The CWP shall be configurable to allow the ANSP to generate the rules and filters to select the TC-Aid notifications to be displayed once TC-Aid has compared tactical, deviation and co-ordination trajectories of a flight with tactical, deviation and co-ordination trajectories of all other flights.
Title	Configurability of the filters to select TC-Aid notifications
Status	<In Progress>
Rationale	CWP needs to be configurable enough to allow the ANSP configure it as they wish. Example of possible filters: - filter encounters according to minimum separation - not display.encounters if the time of minimum separation is in the past (i.e. the lateral separation is increasing)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1201
1202   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCAN.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0240	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0260	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0300	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0310	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0320	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1203

1204   [REQ]

Identifier	REQ-10.04.01-TS-0006.0041
Requirement	The CWP shall make available for display at least the most updated information related to each detected encounter: a) Involved aircraft b) Unique encounter ID c) Start of separation infringement (time and position) d) Closest lateral point of approach (time and position) – both laterally and vertically e) End of separation infringement (time and position) f) Closest lateral distance g) Encounter typology h) Encounter geometry j) Severity classification
Title	Encounter data display
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0005.0009. The Conflict Management functional block provides the data related to each detected encounter. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1205

1206   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2008	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3104	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1070	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1090	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1030	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1100	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0008	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0009	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0010	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0010	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0013	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0018	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MACK.0001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1004	<Partial>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1207

1208   [REQ]

Identifier	REQ-10.04.01-TS-0006.0014
Requirement	The CWP shall display the geometry of tactical encounters distinguishing between: • Head on • Crossing • Catch-up • Not applicable
Title	CWP to display Tactical Encounter Geometry.
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0002.0031. This requirement specifies the encounter horizontal geometry in 2D in order to provide to the controller an overview of the encounter. The "not applicable" geometry will be assigned to encounters when at least one of the interacting aircraft's predictions has no defined direction of flight, for example when being in a hold volume.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1209

1210   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2008	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3104	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MCLA.1004	<Partial>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1211   ### 3.1.5.2.2 What-if/what-else

1212

1213   [REQ]

Identifier	REQ-10.04.01-TS-0006.0015
Requirement	The CWP shall allow the operator to probe for tactical encounters detection (i.e. what-if, what-else functions) before issuing a tactical clearance or a coordination proposal to the flight plan.
Title	CWP to display What-if probes
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0002.0048. The CWP allows performing a probe before applying a tactical command.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1214

1215   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0115	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0600	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1216
1217
1218 [REQ]

Identifier	REQ-10.04.01-TS-0006.0017
Requirement	The CWP shall provide access to the tactical What-if probes for any flight having a tactical trajectory.
Title	The CWP to display What-if probes for a flight
Status	\<In Progress\>
Rationale	Related to REQ-10.04.01-TS-0002.0058. The CWP allows that What-if can be performed for every tactical trajectory in order to probe a command.
Category	\<HMI\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

1219
1220 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MWHA.1002	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-SPR-CDR2.1180	\<Full\>
\<ALLOCATED_TO\>	\<Functional block\>	Controller HMI Management	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

1221
1222 [REQ]

Identifier	REQ-10.04.01-TS-0006.1018
Requirement	The CWP shall allow an eligible operator to perform the following Probe orders (i.e. what-if, what-else) on an eligible flight: - Flight level probes. - Route probes, either Direct probes or 2D RNP probes. - Heading probes. - Speed probes.
Title	The CWP to display What-if/What-else probes for a flight
Status	\<In Progress\>
Rationale	Related to REQ-10.04.01-TS-0002.0055. The CWP displays and allows the controller to interact with the Probe orders functionalities.
Category	\<HMI\>
Verification Method	\<Test\>
Validation Method	\<Real Time Simulation\>

1223
1224 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<Enabler\>	APP_ATC_155	\<Full\>
\<SATISFIES\>	\<Enabler\>	ER_ATC_157	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MWHA.0001	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MWHA.1001	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MWHA.1004	\<Partial\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-MWHA.1005	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0150.0600	\<Full\>
\<SATISFIES\>	\<ATMS Requirement\>	REQ-05.07.02-OSED-0150.0700	\<Full\>
\<ALLOCATED_TO\>	\<Functional block\>	Controller HMI Management	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.01	N/A
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA03.03.02	N/A
\<ALLOCATED_TO\>	\<Project\>	10.04.01	N/A

1225
1226 [REQ]

Identifier	REQ-10.04.01-TS-0006.2018
Requirement	The CWP shall allow an eligible operator, issuing a What-else probe order, to display the following data as response to his request:

	1) Flight level probes:
	  a) if level is conflict free;
	  b) if level is blocked;
	  c) if level can only be reached if a vertical rate is provided, displaying the conflict free vertical rates provided by the TC-Aid function.
	2) Route (either Direct or 2D RNP) and heading probes:
	  a) if Route or heading is conflict free;
	  b) if Route or heading is not conflict free.

Title	The CWP to display different data from What-else probe orders
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0002.0055. Display of data regarding What-else probes when requested by the Controller.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1227
1228   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2036	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1320	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1005	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0150.0700	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1250	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1229

3.1.5.2.3 Interaction with tactical encounters

1231
1232   [REQ]

Identifier	REQ-10.04.01-TS-0006.3018
Requirement	The CWP shall allow to acknowledge manually an encounter detected by TC-Aid.
Title	Acknowledge manually an encounter detected by TC-Aid
Status	<In Progress>
Rationale	The tactical controller should have means to supress or delete the unwanted/nuisance alerts. The manual acknowledgement can be in the form of suppressing/deleting the encounter (in the case of unwanted/nuisance alerts), tagging the encounter or similar.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1233
1234   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1360	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0230	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1235
1236

1237 ### 3.1.5.3 CWP - Planning Conflict HMI

1238 The requirements described in this section cover the detailed presentation (HMI) of data and features
1239 described in section 3.1.3.

1240 | **Note**: although the current Separation Management concept includes three Separation Services for |
1241 | completeness, the Planning Conflict Detection ("CD/R aid to the PC") is out of the SESAR Solution |
1242 | #27 because it has not yet reached V3 maturity. Related to Solution #32 and #33 only PCP |
1243 | requirements, labelled as shall in the OSED and SPR, are considered as input. |

1244 ### 3.1.5.3.1 Planning encounters display

1245 [REQ]

Identifier	REQ-10.04.01-TS-0006.0040
Requirement	At any time, each of the CWPs shall allow to Open/Close any available graphical HMI component related to the PC-Aid service.
Title	Open/Close graphical HMI component related to the PC-Aid
Status	<In Progress>
Rationale	The controller has the capability to open/close any available graphical HMI component related to the PC-Aid service according to his needs. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1246
1247 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3054	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1248
1249 [REQ]

Identifier	REQ-10.04.01-TS-0006.0023
Requirement	When PC-Aid service is available, the CWP shall display information related to planning encounters.
Title	Planning encounters displayed in the CWP
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0065. PC-Aid provides information related to planning encounters at every PC-Aid equipped workstation. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1250

1251   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.1002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3051	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3087	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4013	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4048	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1060	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MEXC.0001	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1252
1253   [REQ]

Identifier	REQ-10.04.01-TS-0006.0024
Requirement	The CWP shall use and display the following information for each planning encounter detected by the PC-Aid: • encounter identifier • aircraft identifications • time of first infringement of separation criteria between aircraft nominal position • time of end of infringement of separation criteria between aircraft nominal positions • time of minimum distance between aircraft nominal position • nominal distance between aircraft at time of minimum distance between aircraft • sector(s)/centre(s) where flights are located at minimum separation • encounter geometry • severity classification
Title	CWP Planning encounter information display
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0044. The CWP must display the PC-Aid Service results. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1254
1255   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.1002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3057	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4013	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4015	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1060	<Partial>

<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0009	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0010	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0011	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0012	<Partial>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1256
1257   [REQ]

Identifier	REQ-10.04.01-TS-0006.0020
Requirement	The CWP shall display the geometry of the planning encounters and distinguishing between: • Head on • Crossing • Catch-up • Converging
Title	CWP displays different encounter geometries detected.
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0012. Display different geometries for an encounter should be displayed on the basis of the mutual directions of the flights involved. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1258
1259   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.1002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4013	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4015	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1530	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FRPC.1007	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1260
1261   [REQ]

Identifier	REQ-10.04.01-TS-0006.0019
Requirement	The CWP shall display encounters detected by PC-Aid Service classifying them according to: - proximity - geometry - uncertainty of the predicted aircraft positions.
Title	CWP displays different encounters detected by PC-Aid.
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0008. To help prioritize the encounters they are classified according to the proximity, geometry and uncertainty of the aircraft positions involved. Proximity is intended as separation minima. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection)

	• EXE-05.07.02-VP-741 (V2, Planning Conflict Detection)
	• EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
	• EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1262
1263   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.1002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1520	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1264
1265   [REQ]

Identifier	REQ-10.04.01-TS-0006.0052
Requirement	The CWP shall allow to filter the planning encounters in order to present them only to the Team, or Teams, controlling the sector(s) that have the responsibility to resolve them.
Title	Planning encounters' filtering
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0066. The PC-Aid supports the CWP in filtering encounters in order to be displayed only to the Team, or Teams, controlling the sector(s) that have the responsibility to resolve them. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1266
1267   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3051	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1440	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1500	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0017	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.03-OSED- MMSP.0008	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1268
1269   [REQ]

Identifier	REQ-10.04.01-TS-0006.0093
Requirement	The CWP shall alert the controller if the severity of any planning encounters increases.
Title	Alert display of a planning encounter severity increase.
Status	<In Progress>
Rationale	Controller must always be made aware of any changes in the encounters and, even more, of an increase in their severity. The alert can be either acoustic and/or visual.

Category	\<HMI>
Verification Method	\<Test>
Validation Method	\<Real Time Simulation>

1270
1271   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES>	\<Enabler>	ER_ATC_157-yy	\<Full>
\<SATISFIES>	\<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1030	\<Full>
\<ALLOCATED_TO>	\<Functional block>	Controller HMI Management	N/A
\<APPLIES_TO>	\<Operational Focus Area>	OFA03.03.01	N/A
\<ALLOCATED_TO>	\<Project>	10.04.01	N/A

1272
1273   [REQ]

Identifier	REQ-10.04.01-TS-0006.0053
Requirement	For each pair of flights selected manually, CWP shall display the following PC-Aid information: - The closest lateral distance between the trajectories; - Vertical separation between the trajectories at the closest lateral proximity; - Time to the closest separation; - Position of each flight at the closest separation; - Sector(s)/centre(s) where flights are located at minimum separation
Title	Information displayed when a pair of flights is selected
Status	\<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0071. The PC-Aid Service results must be displayed for manually selected pairs of flights.
Category	\<HMI>
Verification Method	\<Test>
Validation Method	\<Real Time Simulation>

1274
1275   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES>	\<Enabler>	APP_ATC_155	\<Full>
\<SATISFIES>	\<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0009	\<Full>
\<SATISFIES>	\<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0010	\<Partial>
\<SATISFIES>	\<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0011	\<Partial>
\<SATISFIES>	\<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0012	\<Partial>
\<SATISFIES>	\<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0018	\<Partial>
\<SATISFIES>	\<ATMS Requirement>	REQ-05.07.02-OSED-MINF.0001	\<Partial>
\<ALLOCATED_TO>	\<Functional block>	Controller HMI Management	N/A
\<APPLIES_TO>	\<Operational Focus Area>	OFA03.03.02	N/A
\<ALLOCATED_TO>	\<Project>	10.04.01	N/A

1276
1277   [REQ]

Identifier	REQ-10.04.01-TS-0006.0077
Requirement	The CWP shall display an encounter notification to the Planner Controller who is responsible for the adjacent sector in case a potential encounter occurs within an adjacent sector´s AOI.
Title	Display a notification to the Planner responsible when a potential encounter in the adjacent AOI
Status	\<In Progress>
Rationale	Planner controller of a sector has always to be aware of what happens in its AOI including the encounters.
Category	\<HMI>
Verification Method	\<Test>
Validation Method	\<Real Time Simulation>

1278
1279   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES>	\<Enabler>	APP_ATC_155	\<Full>

<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0015	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1280

3.1.5.3.2 Horizontal View

1281

1282 [REQ]

Identifier	REQ-10.04.01-TS-0006.0029
Requirement	The CWP shall display on the horizontal plane the controller-selected flight trajectory and all the aircraft to aircraft/airspace encounters detected by the PC-Aid, in which the selected flight is involved.
Title	Plan View
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0051. PC-Aid provides to the CWP information about any aircraft to aircraft encounters and aircraft to airspace encounters in which the flight is involved, for display on the general radar picture (plan view). This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1283
1284 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3057	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4014	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3032	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0041	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1285
1286 [REQ]

Identifier	REQ-10.04.01-TS-0006.0030
Requirement	The CWP shall display on the horizontal plane of a selected-controlled flight all the tentative and speculative planning encounters in which that flight is involved.
Title	Tentative and speculative encounter display on horizontal plane
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0062. PC-Aid detects all the tentative and speculative planning encounters in which that flight is involved, on the horizontal plane. Note that one of the options to display the encounters is by a direct interaction of the controller manually selecting the concerned flights. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>

Verification Method	<Test>
Validation Method	<Real Time Simulation>

1287
1288   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3057	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1060	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0041	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1289

3.1.5.3.3 Vertical View

1290
1291   [REQ]

Identifier	REQ-10.04.01-TS-0006.2027
Requirement	The CWP shall allow to access the Planning Vertical Window from the Flight Data Menu.
Title	Elevation view display in the CWP from Flight Data Menu.
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0048. The presentation in the CWP of flight trajectories and encounter in the vertical plane corresponds to the vertical view from Flight Data Menu.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1292
1293   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4013	<Partial>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1294
1295   [REQ]

Identifier	REQ-10.04.01-TS-0006.1027
Requirement	The CWP shall display in the elevation view the controller-selected flight trajectory.
Title	Elevation view display in the CWP.
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0048. The presentation in the CWP of flight trajectories and encounter in the vertical plane corresponds to the vertical view.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1296
1297   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4013	<Partial>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1120	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0013	<Partial>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1298

1299   [REQ]

Identifier	REQ-10.04.01-TS-0006.3027
Requirement	The CWP shall display in the elevation view all the information related to all the aircraft to aircraft/airspace encounters in which the selected Flight is involved together with the levels/time of the encounters.
Title	Elevation view display in the CWP with encounters information.
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0048. CWP to display trajectory and encounter data for a controller-selected flight in the elevation view. The presentation in the CWP of flight trajectories and encounter in the vertical plane corresponds to the vertical view.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1300

1301   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1302

1303   [REQ]

Identifier	REQ-10.04.01-TS-0006.0028
Requirement	The CWP shall display in the elevation view of a selected-controlled flight all the tentative and speculative planning encounters in which that flight is involved.
Title	Tentative and speculative encounter display in vertical view of the CWP
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0049. CWP to display all tentative and speculative encounter data for a controller-selected flight in the elevation view. Elevation view corresponds to the vertical view. Note that one of the options to display the encounters is by a direct interaction of the controller manually selecting the concerned flights.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1304

1305   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4013	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1060	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1110	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1120	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.0002	<Partial>
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

3.1.5.3.4 Interaction with planning encounters

1306

1307 [REQ]

Identifier	REQ-10.04.01-TS-0006.0026
Requirement	The CWP shall allow an eligible operator to reassess planning encounters by a manual or a cyclical update.
Title	Planning encounters reassessment allowed by the CWP
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0047. Manual planning encounters reassessment means that reassessment is triggered in the CWP by a user action. Cyclical planning encounters reassessment means that reassessment occurs when planning encounters information are updated (e.g. latest trajectory information). This is to support the real-time display of planning encounters affecting the current coordinations for aircraft. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1308
1309 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3087	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0018	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0019	<Partial>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1310
1311 [REQ]

Identifier	REQ-10.04.01-TS-0006.0025
Requirement	The CWP shall allow the controller to display CD&R information and to interact with the CD&R services that are available for a selected flight.
Title	CD&R Services display affecting one single selected Flight.
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0045. The controller should be able to make specific flights a target of the CD&R actions.This requirement does not refer to force a manual conflict detection, it just aims to say that the selected flight will become the subject of conflict detection and resolution at the workstation at which the selection is made. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-DSNA (V3 R5, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1312
1313   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3055	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3057	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4014	<Partial>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1314
1315   [REQ]

Identifier	REQ-10.04.01-TS-0006.0064
Requirement	The time between which the planner points out encounters of tactical interest to the tactical workstation display shall be an offline defined number of seconds.
Title	Exact time of displaying the coordination time-out
Status	<In Progress>
Rationale	There is a need for the CWP to show the coordination point out within a maximum time x in order to avoid delays large enough to lead the controllers to make mistakes.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1316
1317   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1380	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1318
1319   [REQ]

Identifier	REQ-10.04.01-TS-0006.0090
Requirement	The CWP shall allow the Executive Controller and the Planner to independently remove the coordination point out.
Title	Removal of the coordination point out
Status	<In Progress>
Rationale	Both Executive and Planner Controllers must be able to delete the coordination point out independently.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1320
1321   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1390	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1322
1323   [REQ]

Identifier	REQ-10.04.01-TS-0006.0072
Requirement	The CWP shall allow to manually re-distribute a planning encounter for display purposes to other CWP.
Title	Manual redistribution of a planning encounter to other CWP

Status	<In Progress>
Rationale	A controller should be able to share the planning encounter with another CWP.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1324

1325   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0004	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1326

1327   [REQ]

Identifier	REQ-10.04.01-TS-0006.0080
Requirement	The CWP shall allow to acknowledge manually an encounter detected by PC-Aid.
Title	Acknowledge manually an encounter detected by PC-Aid
Status	<Validated>
Rationale	The acknowledge of an encounter is needed not to skip any of them. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1328

1329   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1450	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MACK.0001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0005	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1330

1331   [REQ]

Identifier	REQ-10.04.01-TS-0006.0081
Requirement	The CWP shall allow to acknowledge manually again the PC-Aid detected encounter in case the predicted minimum distance decreases more than a predefined parameter value from the predicted minimum distance when encounter is acknowledged.
Title	Acknowledge again manually when a minimum distance decreases
Status	<Validated>
Rationale	Making the Controller to acknowledge again an encounter ensures that she/he has seen this decrease of distance, which makes it more dangerous. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1332

1333 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MACK.0002	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1334
1335 [REQ]

Identifier	REQ-10.04.01-TS-0006.0100
Requirement	If an encounter is not acknowledged at parameter time before the encounter start time, the CWP shall automatically display the encounter to the respective executive controller.
Title	Send encounter automatically to the EC if not acknowledged at parameter time.
Status	<In Progress>
Rationale	This functionality ensures the notification of an encounter to the EC if not acknowledged by a reasonable amount of time.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1336
1337 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0005	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1338
1339 [REQ]

Identifier	REQ-10.04.01-TS-0006.0078
Requirement	The CWP shall allow the Controller to remove planning encounter data from display.
Title	Removing encounter data in case of change in the FP
Status	<In Progress>
Rationale	Controller, seeing a change in the FP, can decide to remove the encounter data display.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1340
1341 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0020	<Partial>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1342

1343 ### 3.1.5.3.5 Coordination

1344 [REQ]

Identifier	REQ-10.04.01-TS-0006.0021
Requirement	The CWP shall display to an eligible operator the current encounters related to a subject flight.
Title	CWP as help to the coordination within different sectors
Status	<In Progress>

Rationale	Related to REQ-10.04.01-TS-0003.0034. The PC-Aid to enable a planning controller encounters review which is typically done for a flight before setting and agreeing to its entry/exit coordination contracts with neighbouring sectors. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1345
1346   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3051	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3055	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3057	<Partial>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1347
1348   [REQ]

Identifier	REQ-10.04.01-TS-0006.0031
Requirement	For each subject flight, the CWP shall display both horizontal and vertical context traffic, associated with the planning sector.
Title	Context traffic display
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0003.0056. PC-Aid provides to the CWP information about horizontal and vertical context traffic associated with the planning sector. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1349
1350   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3110	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4048	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1120	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MNOT.0022	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MSEP.0041	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1351
1352   [REQ]

Identifier	REQ-10.04.01-TS-0006.0098
Requirement	The CWP shall display all the flights (context flights) that are between the

	entry level and the proposed exit flight level along the subject flights trajectory when a potential Exit flight level is probed using the PC Aid.
Title	Context flights display between entry and exit flight levels when probing a PC Aid Exit level.
Status	<Validated>
Rationale	Controller needs to be aware of all the environment flights when probing a potential flight level.
	This requirement has been implemented in project prototypes used in the following validation exercises:
	• EXE-05.07.02-VP-741 (V2, Planning Conflict Detection)
	• EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1353
1354   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1340	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1355
1356   [REQ]

Identifier	REQ-10.04.01-TS-0006.0096
Requirement	CWP shall remove any coordination that has been rejected from PC-Aid consideration.
Title	Remove coordination rejected from PC-Aid consideration
Status	<Validated>
Rationale	In order not to provoke misunderstandings, all rejected coordinations from the PC-Aid have to be deleted from the CWP.
	This requirement has been implemented in project prototypes used in the following validation exercises:
	• EXE-05.07.02-VP-741 (V2, Planning Conflict Detection)
	• EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1357
1358   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1210	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1359

1360   ### 3.1.5.3.6 What-if/what-else

1361   [REQ]

Identifier	REQ-10.04.01-TS-0006.0022
Requirement	The CWP shall display the tentative encounters between a flight involved in an entry coordination dialogue to a sector and any other flight already assumed in the same sector, in order to advise the ATCO about the offer acceptability.
Title	CWP to facilitate Coordination acceptability within different sectors
Status	<In Progress>

Rationale	Related to REQ-10.04.01-TS-0003.0035. CWP has to display PC-Aid support to planning controller in assessing the suitability of sector entry and exit condition for a flight reviewing the encounters related to that flight. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1362
1363 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3104	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.1002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3044	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3058	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3120	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3077	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2027	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1020	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1364

3.1.5.4 CWP - Solver Service HMI

1366 The requirements described in this section cover the detailed presentation (HMI) of data and features
1367 described in section 3.1.4.

1368 **Note**: although the current Separation Management concept includes three Separation Services for
1369 completeness, the Solver Service ("TRACT") is out of the SESAR Solution #27 because it has not yet
1370 reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the
1371 OSED and SPR, are considered as input.

1372
1373 [REQ]

Identifier	REQ-10.04.01-TS-0006.0032
Requirement	The CWP shall receive and make available to the operator the following information associated with the displayed encounters: - the list of solving instructions to be applied to flights - the encounters solved by the global solution.
Title	Solver service information display
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0004.0007. CWP to be able to display: - the list of solving instructions to be applied to flights - the encounters solved by the global solution.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1374
1375 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2037	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A

<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1376

1377   [REQ]

Identifier	REQ-10.04.01-TS-0006.0033
Requirement	The CWP shall display the information related to solved encounters.
Title	Solved encounters information display
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0004.0017. CWP displays information about the solved encounters.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1378

1379   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2019	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1380

1381   [REQ]

Identifier	REQ-10.04.01-TS-0006.0034
Requirement	The CWP shall tag all the flights involved in encounters solved by the solver services.
Title	Solved encounters flights display
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0004.0018. CWP to indicate all the flights involved in solved encounters.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1382

1383   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2019	<Full>
<ALLOCATED TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1384

1385   [REQ]

Identifier	REQ-10.04.01-TS-0006.0035
Requirement	The CWP shall remove the tag from the display for those flights that are no longer involved in a solving instruction due to the cancellation of the solution by the solver services, if they are not involved in another one.
Title	De-highlight of flights no longer involved in a solved encounter
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0004.0019. When the solution of an encounter is cancelled, the CWP should un-tag the flights involved in this encounter (if they are not involved in another solved encounter).
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1386

1387   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3108	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3078	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2039	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1388

1389   [REQ]

Identifier	REQ-10.04.01-TS-0006.0036
Requirement	The CWP shall display a tag for those flights that are involved in a solving instruction computed by the solver services.
Title	Highlight of flights involved in solving instructions
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0004.0020. For each solved encounter, the CWP supports the tagging of the flights involved in a solving instruction computed by the system.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1390
1391   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3065	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3107	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1392

1393   [REQ]

Identifier	REQ-10.04.01-TS-0006.0037
Requirement	When requested manually, CWP shall display information related to encounters solved by the solver services.
Title	Display of solved encounters
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0004.0021. On controller's request, the CWP displays information about the solved encounters.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1394
1395   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3066	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1396

1397   [REQ]

Identifier	REQ-10.04.01-TS-0006.0038
Requirement	When requested manually, the CWP shall display the following data related to solving instructions for a flight: • Solving Instruction • Target point • Duration, if it applies

Title	Display of solving instructions
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0004.0022. The CWP is able to provide information about the solving instruction and its attributes when requested. For TRACT service, the solving instructions are limited to CTO. The current status of the CTO (e.g. "sent to aircraft", "accepted by air crew",..) is displayed by HMI.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1398
1399   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2019	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3067	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1400
1401   [REQ]

Identifier	REQ-10.04.01-TS-0006.0039
Requirement	The CWP shall display TRACT solution by using the following data related to it: • CTO(s) involved in the solution • Application point(s) of the CTO(s) • Current status of each CTO • Flights involved in the solution
Title	TRACT solution display
Status	<In Progress>
Rationale	Related to REQ-10.04.01-TS-0005.0011. The CWP should be able to display the TRACT solutions that are provided by the Conflict Management functional block.
Category	<HMI>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1402
1403   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3065	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3107	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3067	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2031	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4027	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1404

3.2 Adaptability

1405

1406   No adaptability system requirements can be derived from SPR documents for Step1.

3.3 Performance Characteristics

1407

1408   [REQ]

Identifier	REQ-10.04.01-TS-PERF.0001
Requirement	The conflict management function shall be able to manage at least 200 flights

	per TMA.
Title	Conflict management flight capacity
Status	<In Progress>
Rationale	The number of managed flights per control area includes flights under control (in live status) or within the look ahead time per each control area. Capacity for future flights (not within the look ahead time) or additional control areas are outside this number.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1409

1410   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.3020	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1411

1412   [REQ]

Identifier	REQ-10.04.01-TS-PERF.0002
Requirement	The conflict management function shall be able to manage simultaneously at least 1 tentative trajectory per each controller working position.
Title	Conflict management what-if capacity
Status	<In Progress>
Rationale	Capacity requirement for what-if conflict management.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1413

1414   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.3030	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1415

1416   [REQ]

Identifier	REQ-10.04.01-TS-PERF.0003
Requirement	The conflict management function shall be able to manage simultaneously 1 tentative trajectory per flight plan.
Title	Conflict management what-if capacity
Status	<In Progress>
Rationale	A controller could request a what-if (so a tentative trajectory) per each flight plan. They won't be assessed between them for conflicts (only a tentative with "real" trajectories).
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1417

1418   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.3030	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1419

1420 [REQ]

Identifier	REQ-10.04.01-TS-PERF.0004
Requirement	The conflict management function shall be able to manage simultaneously 1 what-else probe per each controller working position.
Title	Conflict management what-else capacity
Status	<In Progress>
Rationale	In a what-else probe, the number of speculative trajectories to be simultaneous per the flight plan is defined by the tactical action (a CFL, a heading…) and the different number of alternatives to be displayed.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1421
1422 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.3030	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1423

1424 3.4 Safety & Security

1425 The requirements included in this section have been derived from the latest available 04.07.02
1426 SPR [15] covering the CD&R Aid to PC and the CD&R Aid to TC services.

1427 3.4.1 Tactical Conflict Detection

1428 [REQ]

Identifier	REQ-10.04.01-TS-SAFE.1000
Requirement	The probability of Loss of TC-Aid shall be no more than 3.33E-07 per flight hour.
Title	Acceptability of Loss of TC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1429
1430 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.2030	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.2210	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DR00.0313	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FR00.0315	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1431

1432   [REQ]

Identifier	REQ-10.04.01-TS-SAFE.1001
Requirement	The probability of Delay of the TC-Aid shall be no more than 3.33E-07 per flight hour.
Title	Acceptability of Delay of TC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1433
1434   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.2070	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1435

1436   [REQ]

Identifier	REQ-10.04.01-TS-SAFE.1002
Requirement	The probability of Corruption (Undetected) of the TC-Aid shall be no more than 0.4E-07 per flight hour.
Title	Acceptability of Corruption (Undetected) of TC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details and in 05.07.02 SPR.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1437
1438   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.2110	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.2170	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.2180	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1439
1440   [REQ]

Identifier	REQ-10.04.01-TS-SAFE.1003
Requirement	The probability of Corruption (Detected) of the TC-Aid shall be no more than 0.4E-07 per flight hour.
Title	Acceptability of Corruption (Detected) of TC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details and in 05.07.02 SPR.

Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1441
1442 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.2140	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.2190	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.2200	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1443
1444 [REQ]

Identifier	REQ-10.04.01-TS-SAFE.1004
Requirement	The probability of missed detection of encounter by the TC-Aid shall be no more than 8.25E-04 per flight hour.
Title	Acceptability of missed detection for TC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 05.07.02 SPR and Free Route SPR.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1445
1446 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.2140	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DR00.0314	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FR00.0316	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1447 ## 3.4.2 Planning Conflict Detection

1448 **Note**: although the current Separation Management concept includes three Separation Services for
1449 completeness, the Planning Conflict Detection ("CD/R aid to the PC") is out of the SESAR Solution
1450 #27 because it has not yet reached V3 maturity. Related to Solution #32 and #33 only PCP
1451 requirements, labelled as shall in the OSED and SPR, are considered as input.

1452
1453 [REQ]

Identifier	REQ-10.04.01-TS-SAFE.2000
Requirement	The probability of loss of PC-Aid shall be no more than 9.52E-06 per flight hour.
Title	Acceptability of Loss of PC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details and in 05.07.02 SPR.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1454
1455 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.2040	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.2010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DR00.0311	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FR00.0313	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1456
1457 [REQ]

Identifier	REQ-10.04.01-TS-SAFE.2001
Requirement	The probability of delay of the PC-Aid shall be no more than 9.52E-06 per flight hour.
Title	Acceptability of Delay of PC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1458
1459 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.2090	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1460
1461 [REQ]

Identifier	REQ-10.04.01-TS-SAFE.2002
Requirement	The probability of corruption (undetected) of the PC-Aid shall be no more than 0.2E-06 per flight hour.
Title	Acceptability of Corruption (Undetected) of PC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details and in 05.07.02 SPR.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1462
1463 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.2140	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.2040	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1464
1465 [REQ]

Identifier	REQ-10.04.01-TS-SAFE.2003
Requirement	The probability of corruption (detected) of the PC-Aid shall be no more than 0.2E-05 per flight hour.

Title	Acceptability of Corruption (Detected) of PC-Aid
Status	<In Progress>
Rationale	The requirement is given in the 04.07.02 SPR which refers to the SAR for additional details and in 05.07.02 SPR.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1466

1467   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.2190	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.2020	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1468

1469   [REQ]

Identifier	REQ-10.04.01-TS-SAFE.2004
Requirement	The probability of missed detection of encounter by the PC-Aid shall be no more than 1E-03 per flight hour.
Title	Acceptability of missed detection for PC-Aid
Status	<In Progress>
Rationale	The requirement is given in the Free Route SPR.
Category	<Safety>
Verification Method	<Analysis>
Validation Method	<Real Time Simulation>

1470

1471   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-DR00.0312	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-FR00.0314	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1472

3.5 Maintainability

1474   Requirements related to maintainability have not been derived from 4.7.2 OSED. This section will be
1475   revised when some more information becomes available.

3.6 Reliability

1477   Requirements related to reliability have not been derived from 4.7.2 OSED. This section will be
1478   revised when some more information becomes available.

3.7 Functional block Internal Data Requirements

1480   All requirements about internal data are left to the design/implementation choice.

3.8 Design and Construction Constraints

1482   There are not requirements that constrain design and construction of the functional block.

3.9 Functional block Interface Requirements

This section presents the Interface Requirements for the Conflict Management functional block that have been identified for Step 1.

Note: although the current Separation Management concept includes three Separation Services for completeness, the "CD/R aid to the PC" and the "TRACT" services are out of the SESAR Solution #27 because they have not yet reached V3 maturity. Related to Solution #32 and #33 only PCP requirements, labelled as shall in the OSED and SPR, are considered as input.

3.9.1 Conflict management functional block Input Requirements

[REQ]

Identifier	REQ-10.04.01-TS-0005.0001

Requirement	The Conflict Management functional block shall receive all the available trajectories for flights that are eligible for CD&R processing from the Trajectory Prediction & Management functional block, including:
	    • Planned sequence trajectory (including uncertainty)
	    • Tactical trajectory (including uncertainty)
	    • Entry trajectory
	    • Exit trajectory
	    • Deviation trajectory
	    • Context trajectory
	    • Tentative trajectory
	    • Speculative trajectory
	    • TRACT trajectory (including uncertainty)
	It is assumed that the relevant trajectories reflect the latest CTO, airborne derived data and controller clearances.

Title	Obtaining relevant trajectories
Status	<Validated>

Rationale	This technical requirement defines the required inputs to the Conflict Management block associated with the traced to OSED requirements, and does not include the actual trajectory generation which is P10.02.01 scope. This requirement has been implemented in project prototypes used in the following validation exercises:
	    • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
	    • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection)
	    • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection)
	    • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection)
	    • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection)
	    • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)

Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER ATC 157-yy	<Full>
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2007	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2034	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2011	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3109	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4047	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1020	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR1.1030	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1190	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-SPR-CDR2.1230	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1006	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-0100.0180	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1494

1495   [REQ]

Identifier	REQ-10.04.01-TS-0005.0005
Requirement	The Conflict Management functional block shall receive all manual ATCO inputs that change the flight behaviour from the Trajectory Prediction & Management functional block, including manual speed instructions and a manual CTO cancellation status.
Title	Manual ATCO Input Data
Status	<In Progress>
Rationale	Required for TRACT to discard solution based on manual ATCO input.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1496

1497   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3113	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3114	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1498

1499   [REQ]

Identifier	REQ-10.04.01-TS-0005.0007
Requirement	The Conflict Management functional block shall receive the latest status associated with CTO requests between aircrew and TRACT. It is assumed that the status is set to one of the following: • WILCO • UNABLE • STANDBY
Title	TRACT CTO Status
Status	<In Progress>
Rationale	The latest status is used by TRACT to determine if the flight can be included in the TRACT solution or not.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1500

1501   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4026	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4028	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.4029	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1502

1503   [REQ]

Identifier	REQ-10.04.01-TS-0005.0012
Requirement	The Conflict Management functional block shall receive Adaptation data

	from Support Functions.
Title	Adaptation data input
Status	<Validated>
Rationale	Required to configure the system to the operational environment. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1504

1505   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1506

1507   [REQ]

Identifier	REQ-10.04.01-TS-0005.0014
Requirement	The Conflict Management functional block shall receive requested reliable RTA interval for aircraft.
Title	Reliable RTA interval available upon request
Status	<In Progress>
Rationale	Required for TRACT. Technical requirement.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1508

1509   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1510

3.9.2 Conflict Management functional block Output Requirements

1511

1512   [REQ]

Identifier	REQ-10.04.01-TS-0005.0008
Requirement	The Conflict Management functional block shall provide an indication of the loss or unavailability of a CD&R service.
Title	Service Status output
Status	<In Progress>
Rationale	Required to keep ATCO informed of system capabilities. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>

Verification Method	<Test>
Validation Method	<Real Time Simulation>

1513

1514   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2042	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2020	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1515

1516   [REQ]

Identifier	REQ-10.04.01-TS-0005.0009
Requirement	For each encounter the Conflict Management functional block shall provide the following data: a) Involved aircraft b) Unique encounter ID c) Start of separation infringement (time and position) d) Closest lateral point of approach (time and position) – both laterally and vertically e) End of separation infringement (time and position) f) Relation of conflict data with static data (e.g. sectors involved). g) Closest lateral distance h) Encounter typology i) Encounter geometry j) Severity classification (PC-Aid Only)
Title	Encounter data output to HMI
Status	<Validated>
Rationale	Required for display purposes. Not applicable for TRACT that does not publish encounter data. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection) • EXE-04.07.02-VP-500 (V2, Planning Conflict Detection) • EXE-04.07.02-VP-501 (V3 R5, Planning Conflict Detection) • EXE-05.07.02-VP-741 (V2, Planning Conflict Detection) • EXE-05.07.03-VP-267 (V2, Planning Conflict Detection) • EXE-04.03-VP-798-ENAV (V3 R5, Planning Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1517

1518   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157-yy	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2042	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.2015	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3104	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3056	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4013	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4014	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.4015	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MACK.0002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1070	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1030	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1100	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1110	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1519

1520   [REQ]

Identifier	REQ-10.04.01-TS-0005.0013

Requirement	For each What-Else probe the Conflict Management functional block shall output the following data:
	1) Flight level probes:
	  a) level is conflict free;
	  b) level is blocked;
	  c) level can only be reached if a vertical rate is provided.
	2) In case of 1c) the system shall indicate conflict free vertical rates.
	3) Route and heading probes:
	  a) route or heading is conflict free;
	  b) route or heading is not conflict free.

Title	What Else Probe Output data
Status	<Validated>
Rationale	Data required for display. This requirement has been implemented in project prototypes used in the following validation exercises: • EXE-04.07.02-VP-175 (V3 R5, Tactical Conflict Detection)
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

1521

1522   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2042	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1004	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1005	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1320	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1330	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1523

1524   [REQ]

Identifier	REQ-10.04.01-TS-0005.0011
Requirement	For each TRACT solution the Conflict Management functional block shall output the following data: • The CTO(s) involved in the solution • The application point(s) of the CTO(s) • The current status of each CTO • The flights involved in the solution
Title	CD&R output for TRACT solutions
Status	<In Progress>
Rationale	Required for display purposes as well as keeping other ground systems up-to-date.
Category	<Functional>
Verification Method	<Test>
Validation Method	<Real Time Simulation>

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1525

1526   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2019	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.2041	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3066	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3067	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0003.3107	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1527

4 Assumptions

This TS document assumes that all the input data detailed in section 3.9.1 will be available from other systems.

Some requirements from 04.07.02 and 05.07.02 projects are considered out of scope because they are not allocated to the CONF Functional Block. The allocation of OSED ORs to Functional Blocks is done by the project 10.01.07 and can be found in [7]10.01.07 D120 Technical Specifications Review Cycle 2015.

Only Operational PCP Free Route requirements, labelled in the related OSED and SPR as "shall", are considered as input in the TS.

5 References

[1] Template Toolbox 03.00.00
https://extranet.sesarju.eu/Programme%20Library/SESAR%20Template%20Toolbox.dot

[2] Requirements and V&V Guidelines 03.00.00
https://extranet.sesarju.eu/Programme%20Library/Requirements%20and%20VV%20Guidelines.doc

[3] Templates and Toolbox User Manual 03.00.00
https://extranet.sesarju.eu/Programme%20Library/Templates%20and%20Toolbox%20User%20Manual.doc

[4] EUROCONTROL ATM Lexicon
https://extranet.eurocontrol.int/http://atmlexicon.eurocontrol.int/en/index.php/SESAR

[5] SESAR Definition Phase – Task 2.4.x Milestone 3 – System Architecture (DLT-0612-244-00-10), September 2007

[6] IEEE / MIL Standards

[7] SESAR P10.01.07 D120, Technical Architecture Description (TAD) - Cycle 2015 00.01.00, 19/01/2016.

[8] SESAR C.01. D16, Dataset DS16 (Deliverable with contribution from C.02-T024), emaster-plan-data-for-portal-DS16 DS1600 (2016-07-04).xlsx, 04/07/2016.

[9] SESAR P10.04.01 D04, Initial baseline for Conflict Detection and Resolution Tools 00.01.02, 19/05/2011.

[10] SESAR P10.04.01 D06, Conflict Detection and Resolution Tools System Requirements – Step 1 00.02.00, 20/08/2013.

[11] SESAR P10.04.01 D18, Conflict Detection and Resolution Tools System Requirements – Phase 2 01.00.00, 20/11/2014.

[12] SESAR P10.04.01 D33, Conflict Detection and Resolution Tools System Requirements – Phase 3 00.01.00, 04/12/2015

[13] SESAR P10.04.01 D71, Conflict detection and Resolution Tools System Requirements Refinement R4 00.01.00, 29/03/2016

[14] SESAR P04.07.02 M177, Final Draft for OSED_4, 15/07/2016.

[15] SESAR P04.07.02 M179, Final Draft for MTCD/TCT SPR_4, 15/07/2016.

[16] SESAR P05.07.02 D77, Preliminary V2 OSED for Step 1, 30/05/2016.

[17] SESAR P05.07.02 D78, Preliminary V2 SPR for Step 1, 30/05/2016.

[18] SESAR P04.07.02 D37, Free Route OSED for Step 1 - Iteration 2 00.02.01, 12/01/2016

[19] SESAR P04.07.02 M182, Final draft for Free Route SPR for Step 1, 15/07/2016

5.1.1 Use of copyright / patent material /classified material

N/A

5.1.2 Classified Material

N/A

1575 # Appendix A   Deleted requirements

1576 This section lists the technical requirements that were in the previous versions of this TS document
1577 (10.04.01 D06 [10], 10.04.01 D18 [11], 10.04.01 D33 [12] and/or 10.04.01 D71 [13]), and that are
1578 deleted in this document. The requirements are deleted either because they were merged with
1579 another existing requirement, or because the operational requirement they are derived from was
1580 suppressed by the operational project.

1581 [REQ]

Identifier	REQ-10.04.01-TS-0001.0002
Requirement	The Conflict Management functional block shall verify the coherence for the read adaptation data.
Title	Adaptation Coherence
Status	<Deleted>
Rationale	It is necessary to verify the Adaptation Data coherence.
Category	<Functional>
Verification Method	<Test>

1582
1583 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP ATC 155	<Full>
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.1007	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1584
1585 [REQ]

Identifier	REQ-10.04.01-TS-0001.0031
Requirement	If the same aircraft pair is involved in a second encounter of the same type after the first has been resolved, the encounter ID shall remain the same as for the first detected encounter.
Title	Encounter ID for secondary encounters for the same aircraft pair.
Status	<Deleted>
Rationale	A unique encounter ID per aircraft pair is believed to be beneficial, even though it is not yet known how the ATCO will use the encounter ID. Note that this is an OSED requirement. Also, "type of encounter" refers to an encounter between either two tactical trajectories (tactical encounter) or two planning trajectories (planning encounter).
Category	<Functional>
Verification Method	<Test>

1586
1587 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER ATC 162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4039	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1588
1589 [REQ]

Identifier	REQ-10.04.01-TS-0001.0032
Requirement	The Conflict Management functional block shall provide the encounter for display in the first sector that is responsible for (in communication with) both involved aircraft, if such a sector exists.

Title	Sector responsibility for aircraft pairs that are involved in multiple encounters with each other
Status	<Deleted>
Rationale	The information should be displayed in the first relevant sector, i.e. the first sector that may realistically resolve the conflict. Note that an operational issue has been raised to P04.07.02 for this operational requirement due to P10.04.01 doubt that this requirement correctly captures the operational need. According to P04.07.02 the OSED requirements will be reassessed after the V2 experiments, and will be modified if needed.
Category	<Functional>
Verification Method	<Test>

1590
1591   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3037	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1592
1593   [REQ]

Identifier	REQ-10.04.01-TS-0001.0054
Requirement	If no sector has responsibility of both aircraft involved in an encounter, the Conflict Management functional block shall provide the encounter for display in the sector with the Closest Point of Approach.
Title	Sector responsibility for aircraft pairs that are involved in multiple encounters when no sector is responsible for both aircraft.
Status	<Deleted>
Rationale	The information should be displayed in the first relevant sector, i.e. the first sector that may realistically resolve the conflict. Note that an operational issue has been raised to P04.07.02 for this operational requirement due to P10.04.01 doubt that this requirement correctly captures the operational need. According to P04.07.02 the OSED requirements will be reassessed after the V2 experiments, and will be modified if needed.
Category	<Functional>
Verification Method	<Test>

1594
1595   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<Enabler>	ER_ATC_162	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3037	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1596
1597   [REQ]

Identifier	REQ-10.04.01-TS-0001.0034
Requirement	Operators shall be able to negotiate responsibility between sectors for solving encounters supported by PC-Aid and TC-Aid tools.
Title	Sector responsibility negotiating feature
Status	<Deleted>
Rationale	The detailed implementation of this requirement is still under discussion with the P04.07.02 operational experts. For the moment, the expert controllers assume that the manual tag of the "frontier conflicts" that the ATCOs are responsible of, once they have

	coordinated with the others, is the most important feature. Note that this requirement may be a pure HMI requirement if this manual tagging ends up being the only necessary feature.
Category	<Functional>
Verification Method	<Test>

1598
1599   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER APP ATC x05	<Full>
<SATISFIES>	<Enabler>	ER APP ATC 129	<Full>
<SATISFIES>	<Enabler>	ER APP ATC 147	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0004.2027	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1600
1601   [REQ]

Identifier	REQ-10.04.01-TS-0002.0024
Requirement	TC-Aid shall classify a coordination (resp. coordination/tactical encounter) encounter according to the separation of interest values of the uncertainty zones around the predicted aircraft positions.
Title	Coordination trajectories conflicts.
Status	<Deleted>
Rationale	The coordination trajectories generate tactical encounters. Notes: A coordination encounter is a tactical encounter detected between two Entry Trajectories. A coordination/tactical encounter is an encounter detected between an Entry and a Tactical trajectory.
Category	<Functional>
Verification Method	<Test>

1602
1603   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.2035	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3101	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3102	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4041	<Partial>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1604
1605   [REQ]

Identifier	REQ-10.04.01-TS-0002.0029
Requirement	TC-Aid shall determine the classification of a deviation encounter according to the proximity of the predicted aircraft positions and the uncertainty surrounding those positions
Title	Deviation Trajectories Encounters.
Status	<Deleted>
Rationale	The deviation trajectories are critical. Note: A deviation encounter is an encounter detected between two deviation trajectories, while a tactical/deviation encounter is detected between a tactical and a deviation trajectory.
Category	<Functional>
Verification Method	<Review of design><Test>

1606
1607   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1608

1609   [REQ]

Identifier	REQ-10.04.01-TS-0002.0034
Requirement	When comparing the predicted positional information from two flights, one cleared to hold, TC-Aid shall declare a tactical encounter if the distance between the uncertainty around the predicted position of the non-holding aircraft and the holding volume defined for the holding aircraft is less than the separation of interest.
Title	Tactical Encounters with one flight in holding.
Status	<Deleted>
Rationale	The TC-Aid calculates the conflicts with flights in holding using the holding volume instead of normal trajectory uncertainty. Notes: • For the non-holding aircraft, this req. applies to tactical, deviation and entry trajectories. • The holding volume will be considered active when the aircraft starts the holding maneouvre.
Category	<Functional>
Verification Method	<Test>

1610

1611   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3035	<Partial>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1612

1613   [REQ]

Identifier	REQ-10.04.01-TS-0002.0035
Requirement	When comparing the predicted positional information of two flights, both cleared to hold, TC-Aid shall declare a tactical encounter if the holding volumes defined for each aircraft are separated by less than the separation of interest.
Title	Tactical Encounters with both flights in holding.
Status	<Deleted>
Rationale	Holding volumes (in different fixes) could overlap or not be separated enough. The static data will assure in this case that the corresponding tactical trajectories do not have level intersection. The fact that two holding volumes are not separated could be automatically obtained and statically provided to the application by the Adaptation database.
Category	<Functional>
Verification Method	<Test>

1614

1615   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3035	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1616

1617   [REQ]

Identifier	REQ-10.04.01-TS-0002.0037
Requirement	When comparing two flights cleared to hold at different fixes within two holding volumes adapted as separated (static data), TC-Aid shall discard detection of

	tactical encounter for these pair of flights.
Title	Holding in different fixes does not trigger a tactical encounter.
Status	<Deleted>
Rationale	A tactical encounter is not declared when both flights are holding but in different holding points.
Category	<Functional>
Verification Method	<Test>

1618

1619 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4051	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1620

1621 [REQ]

Identifier	REQ-10.04.01-TS-0002.0049
Requirement	When a What-if probe is performed for a flight plan, TC-Aid shall detect the tactical encounters involving the tentative trajectory provided by the TP&M for the probed flight plan.
Title	What-if is updated.
Status	<Deleted>
Rationale	The flight plan with an applied What-if is used dynamically to determine encounters against all the other flight plans and the encounter results are updated taking into account these changes.
Category	<Functional>
Verification Method	<Inspection><Test>

1622

1623 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3039	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.4010	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1240	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1624

1625 [REQ]

Identifier	REQ-10.04.01-TS-0002.0056
Requirement	When any what-if probe is requested for a flight cleared to hold and within the holding volume, TC-Aid shall ignore the hold in the tentative trajectory.
Title	In Holding in CFL probe.
Status	<Deleted>
Rationale	Holding affects the vertical conflicts for a what-if inside the holding volume.
Category	<Functional>
Verification Method	<Test>

1626

1627 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3032	<Partial>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1628

1629 [REQ]

Identifier	REQ-10.04.01-TS-0002.0057
Requirement	When a tentative trajectory for a flight plan is provided by the TP&M, TC-Aid shall perform a What-if probe for the flight plan.
Title	Allowed Tactical Commands in What-if.
Status	<Deleted>
Rationale	The tactical commands that can be probed are those specified, so the TP&M calculates the tentative trajectory with the fictive tactical command and distribute it to CD&R. Upon reception of a tentative trajectory, a What-if probe is performed in order to identify tentative encounters.
Category	<Functional>
Verification Method	<Review of Design><Inspection>

1630
1631   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	APP_ATC_155	<Full>
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3038	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3039	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-05.07.02-OSED-MWHA.1002	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.02	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1632
1633   [REQ]

Identifier	REQ-10.04.01-TS-0002.0066
Requirement	If no sector has responsibility of both aircraft involved in an tactical encounter, the TC-Aid shall provide the encounter for display in the sector with the Closest Point of Approach.
Title	Sector responsibility for aircraft pairs that are involved in multiple tactical encounters when no sector is responsible for both aircraft.
Status	<Deleted>
Rationale	The information should be displayed in the first relevant sector, i.e. the first sector that may realistically resolve the conflict. Note that an operational issue has been raised to P04.07.02 for this operational requirement due to P10.04.01 doubt that this requirement correctly captures the operational need. According to P04.07.02 the OSED requirements will be reassessed after the V2 experiments, and will be modified if needed.
Category	<Functional>
Verification Method	<Test>

1634
1635   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3037	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1636
1637   [REQ]

Identifier	REQ-10.04.01-TS-0003.0006
Requirement	PC-Aid shall detect speculative encounters comparing what-else probed speculative trajectories of the subject flight with the planning trajectories of the environmental flights
Title	Speculative trajectories
Status	<Deleted>
Rationale	Speculative trajectories are the ones that uses flight data other than those currently committed or tentatively selected (during a What-If Probing operation)

	by the controller.
Category	<Functional>
Verification Method	<Test>

1638

1639   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER APP ATC 129	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0002.3049	<Full>
<ALLOCATED_TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1640

1641   [REQ]

Identifier	REQ-10.04.01-TS-0005.0010

Requirement	For each What-If probe the Conflict Management functional block shall output the following data:
	1) Flight level probes:
	    a) level is conflict free;
	    b) level is blocked;
	    c) level can only be reached if a vertical rate is provided.
	2) In case of 1c) the system shall indicate conflict free vertical rates.
	3) Direct and heading probes:
	    a) direct or heading is conflict free;
	    b) direct or heading is not conflict free.

Title	What-If Probe Output data
Status	<Deleted>
Rationale	For a particular What-If probe, only one of the outputs described in the three main bullet-points in the requirement text are relevant.
Category	<Functional>
Verification Method	<Test>

1642

1643   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3040	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1250	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR1.1260	<Full>
<ALLOCATED TO>	<Functional block>	CONF	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1644

1645   [REQ]

Identifier	REQ-10.04.01-TS-0006.0051
Requirement	If no sector has responsibility of both aircraft the CWP shall display the tactical encounter in the sector with the Closest Point of Approach.
Title	CWP display of sector responsibility for aircraft pairs that are involved in multiple encounters when no sector is responsible for both aircraft.
Status	<Deleted>
Rationale	Related to REQ-10.04.01-TS-0002.0066.
Category	<HMI>
Verification Method	<Test>

1646

1647   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER ATC 157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-OSED-0001.3037	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED TO>	<Project>	10.04.01	N/A

1648

1649 [REQ]

Identifier	REQ-10.04.01-TS-0006.0063
Requirement	The CWP shall display the coordination trajectory of a subject flight together with the trajectories of any environmental flights that are interacting with the subject flight, when the Planner interrogates a coordination offer.
Title	Display trajectories of a subject and its environmental flights when a coordination is interrogated
Status	<In Progress>
Rationale	CWP must satisfy the necessity of the Controller awareness regarding a Flight and its environment when interrogating a coordination offer.
Category	<HMI>
Verification Method	<Test>

1650

1651 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1290	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1652

1653 [REQ]

Identifier	REQ-10.04.01-TS-0006.0099
Requirement	The CWP shall allow to point out planning encounters to other controller(s) of the same position.
Title	Display planning encounters that has been pointed-out
Status	<Deleted>
Rationale	In order to pass some instructions from one controller to another, and to be capable of easier identification of the subject encounter, the CWP shall allow to point out planning controllers to other controllers of the same position.
Category	<HMI>
Verification Method	<Test>

1654

1655 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	ER_ATC_157	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.02-SPR-CDR2.1370	<Full>
<ALLOCATED_TO>	<Functional block>	Controller HMI Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA03.03.01	N/A
<ALLOCATED_TO>	<Project>	10.04.01	N/A

1656

1657

1658   **-END OF DOCUMENT-**

1659

1660