STEP1 V3 Final Complexity Management INTEROP

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Abstract

This deliverable includes the final version of the S1 V3 Complexity Management INTEROP which provides functional system description and interoperability requirements for Complexity Assessment and Resolution (CAR) concept. It is based on the final version of the S1 V3 Complexity Management OSED.

This deliverable covers the SESAR Solution #19 'Automated Support for Traffic Complexity Detection and Resolution'.

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None.

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This deliverable consists of SJU foreground.

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Executive summary

This document covers the SESAR Solution #19 ‘Automated Support for Traffic Complexity Detection and Resolution’ providing high level description of the traffic complexity management technical characteristics and associated data flows required to support the Complexity Assessment and Resolution (CAR) service.

Complexity Assessment and Resolution (CAR) is a service that is used by the Local Network Management Function in order to manage, balance, individual ATCO (or sector ATCO team) workload at local level (ACC) and to achieve the goal of maximising the throughput of the ATM system by not wasting, or leaving unused, any latent capacity and reduces safety risks related to workload variations.

The key feature of the Complexity Management optimisation process is the use of complexity metrics that encapsulate the relationship between workload and traffic.

The interacting systems concerned with complexity management concept in SESAR Step 1 are the En Route ATC System and the ETFMS service from Network Manager Operations Centre (NMOC).

The identified function which are concerned with data flows are the complexity computation, the complexity support functions, the complexity management HMI, the complexity resolution, the flight data processing, the Medium Term Conflict Detection, the environmental data configuration, the operational supervision and the external support functions.

The data flows are sorted in the following categories:

- Between complexity management sub-functions
- Between complexity management sub-functions and En Route ATC functions
- Between complexity management sub-functions and other ATM systems

The Complexity management function does not use CNS applications and only ground-ground communications are involved.

1 Introduction

1.1 Purpose of the document

This document details the Interoperability Requirements for Complexity Management in En Route environment within the context of SESAR Concept Story Board STEP 1. Interoperability (IOP) structure and its elements are based on SESAR Joint Undertaking (SESAR JU) template for Interoperability Requirements.

The purpose of the document is to provide high level description of the traffic complexity management technical characteristics and associated data flows required to support the Complexity Assessment and Resolution (CAR) service, addressing the **SESAR Solution #19 'Automated Support for Traffic Complexity Detection and Resolution'**.

Complexity Assessment and Resolution (CAR) is a service that is used by the Local Network Management Function in order to manage, balance, individual ATCO (or sector ATCO team) workload at local level (ACC) and to achieve the goal of maximising the throughput of the ATM system by not wasting, or leaving unused, any latent capacity and reduces safety risks related to workload variations.

The key feature of the Complexity Management optimisation process is the use of complexity metrics that encapsulate the relationship between workload and traffic.

CAR is supported by automated tools capable of assessing traffic complexity over the area of operation (ACC). The automated function provides feedback on the characteristics of the predicted complexity figures identifying those components (airspace structures and trajectories) that are contributing the most to the sector complexity and controller workload.

Complexity Assessment and Resolution (CAR) in ATM is performed within several different time horizons. From short term planning to execution phase, which could be up to 3h and down to 20 minutes from real time. Complexity Management for ATC sectors is firstly handled by the local Network Management function through enhanced ATFCM processes. The related operational processes are described in the current versions of 04.02 and 07.02 Step1 DODs ([6] and [7]).

Table 1 identifies the link with the Operational Processes and Services defined in the 04.02 Step1 DOD [6] which are relevant in the context of the SESAR Solution #19.

DOD Process / Service Title	Process/ Service identification	Process/ Service short description	Reference to 04.02 DOD section
Perform Extended ATC Planning	Assess traffic complexity	To assess the complexity of the future traffic situation at the ACC level based on forecasts within a 120 min look-ahead time.	Section 5.1.2
	Determine de-complexing solution	To identify a potential solution to reduce the imbalance of complexity (using "What-if" facilities). The applicable measures are based on either Dynamic re-sectorisation or trajectory management solutions	Section 5.1.2
	Coordinate de-complexing solution	Co-ordination may involve different actors depending on the de-complexing solution including network management function.	Section 5.1.2
	Prepare de-complexing solution implementation	Among the potential de-complexing measures, EAP will make a full evaluation of the solution for positive network performance impact, and will update the necessary information to actually trigger	Section 5.1.2

DOD Process / Service Title	Process/ Service identification	Process/ Service short description	Reference to 04.02 DOD section
		the implementation of the chosen de-complexing solution	
	Implement de-complexing dynamic re-sectorisation	At the appointed time the new Sector Configuration is implemented to re-distribute traffic flows. Executive Controllers instruct the Concerned flights to contact the appropriate sector via voice or data link.	Section 5.1.2
	Implement trajectory management solutions	This includes the management of individual trajectories (re-routeing, change of FL, allocation of a TRACT issued CTO).	Section 5.1.2
	Monitor de-complexing solution implementation	Activity related to the monitoring of the de-complexing solution's implementation and impact.	Section 5.1.2
	Manage Complexity Management co-ordination receipt	Co-ordination requests are sent to the relevant actors, including if necessary the network manager	Section 5.1.2

Table 1: List of the relevant 04.02 DOD Processes and Services

The scope of the document is restricted only to prospective Interoperability requirements related to Step 1 development of Traffic complexity management system. It is also considered that the system is functioning on an ATC centre level (local level) so the requirements for inter-centre interoperability between different subsystems (e.g. FDPS, DST) are not taken into consideration.

1.2 Intended readership

Intended audience of this document are:

- P04.07.01 Members (ENAIRE, EUROCONTROL, DFS, DSNA and NATS);
- Project Members of the technical project P10.08.01 in charge of the prototype development needed to perform P04.07.01 validation activities (ENAIRE, INDRA and THALES);
- Projects performing validation activities that complete the validation path of the complexity management concept (P13.02.03, P04.07.08, SWP04.03 and SWP05.03);
- Projects within OFAs 05.03.03 'Dynamic Airspace Configuration' and OFA 05.03.04 'Enhanced ATFCM Processes';
- Projects from WP08 supporting the definition of information exchange requirements;
- Project in charge of consolidation activities (B04.03, P10.01.07 and SWPs 04.02 and 07.02).

1.3 Inputs from other projects

N/A

1.4 Glossary of terms

Term	Definition	Source
Air Traffic Management (ATM)	The dynamic, integrated management of air traffic and airspace including air traffic services, airspace management and air traffic flow management —	**ICAO Doc 4444**

Term	Definition	Source
	safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.	
Complexity	In the ATM context, traffic complexity refers to the number of simultaneous or near- simultaneous interactions of trajectories in a given volume of airspace. Note: As there are additional factors that construct complexity on the top of the simultaneous and near simultaneous number of interactions (most simple ones being: weather, mixture of traffic, co-ordination conditions), which don't appear in this definition, for the content of this DOD, we'll prefer to define complexity as measure of the difficulty that a particular traffic situation will present to an air traffic controller.Complexity means "level of difficulty" or "additional workload beyond that directly associated with the number of flights within the regarded airspace".	**4.7.1 teamATM lexicon** **Note from SWP04.02**
Complexity Assessment and Resolution Service	Complexity Assessment and Resolution Service represents a dynamic, automated service, which applies a complexity function using metrics, within a defined airspace of operation in order to predict future controller workload within the appropriate look ahead time horizon. This horizon is directly dependant on trajectory prediction (TP) accuracy and the level of capability and interoperability of ATM systems and tools.	**SWP04.02**
Complexity Indicator	One output (potentially among several) of the complexity assessment algorithms.	**4.7.1 team**
Complexity Management	Assessment and resolution of complexity problems within the given constraints is called Air Traffic Complexity Management. It is performed by the Network Management function in strong co-ordination with the Extended ATC planning function by managing and balancing controllers' workload to achieve the goal of maximising the throughput of the ATM system, by not wasting, or leaving unused, any latent capacity, and of reducing safety risks related to workload variations.	**SWP04.02**
Complexity Metric	Raw figure related to complexity, used as input of the complexity assessment algorithms, in order to compute the Complexity Indicator(s).	**4.7.1 team**
Forecast sector complexity	Forecast of the complexity of the sectors open within a time horizon according to sector configuration schedule.	**4.7.1 team**
Network Management Function (NMF)	Network Management Function is an integrated ATM activity with the aim of ensuring optimised Network Operations and ATM service provision meeting the Network performance targets, which encapsulates: • Collaborative layered planning and execution processes, including the facilitation of business/mission trajectories; • Airspace organisation and management processes; • Demand and Capacity Balancing processes through all planning and execution phases to ensure the most efficient use of airspace resources, to anticipate and solve workload/complexity issues and to minimize the effects of ATM constraints; • The enabling of UDPP process; • The provision and maintenance of Operation Plans covering the range of activity, i.e. Network to Local; • The provision of relevant complexity resolution advice to ATC	**SWP07.02/B.04.02**

Term	Definition	Source
	operations. Based on CDM, the Network Management Function is executed at all levels (Regional, Sub-regional and Local) throughout all planning and execution phases, involving, as appropriate, the adequate actors (e.g. NM, FM, LTM…).	
Network Operations Plan (NOP)	A set of information and actions derived and reached collaboratively and both relevant to, and serving as a reference for, the management of the Pan-European network in different timeframes for all ATM stakeholders, which includes, but is not limited to, targets, objectives, how to achieve them and anticipated impact. The NOP has a dynamic and rolling lifecycle starting in the strategic phase and progressively updated up to and including the execution and post-operations phases. Note: It supports and reflects the result of the collaborative ATM planning process: at each phase, stakeholders collaborate in developing a common view of the planned network situation, allowing each of them to take informed decisions considering the network effect and the Network Manager to ensure the overall co-ordination of individual decisions needed to support network performance.The Network Operations Plan (NOP), a dynamic rolling plan providing a detailed overview (past, current and forecast) of the European ATM environment to those concerned. The overview will contain information about traffic demand, airspace and airport capacity and constraints and scenarios to assist in managing diverse events. The aim of the NOP is to facilitate the processes needed to reach agreements on demand and capacity.	**SESAR Def PhaseATM LExicon**
Process	Process is a composition of activities that are triggered by an event and transforms a specific input into meaningful output.	**SESAR Enterprise Architecture**
Sector	A sector is the area of responsibility assigned to a Unit of Control. A sector is composed of one or several elementary sector.	**4.7.1 team**
Sector complexity	Measure of the workload of the controller in a given ATC sector for a given air traffic situation.	**4.7.1 team**
Sector configuration	Airspace configuration in the Centre of Control (ACC) i.e. the relation between the Units of Control and sectors.	**4.7.1 team**
Service	Service is a capability offered by one actor or actors to others using well defined interfaces. A service is a product of a sequence of processes.	**SESAR Enterprise Architecture**

1.5 Acronyms and Terminology

Term	Definition
ABI	Advance Boundary Information (Message Type Designator)
ACT	Activation Message
ADEXP	ATS Data Exchange Presentation
AoR	Area of Responsibility

Term	Definition
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATS	Air Traffic Services
AFTN	Aeronautical Fixed Telecommunication Network
ATM	Air Traffic Management
CAR	Complexity Assessment and Resolution
CDM	Collaborative Decision Making
CFMU	Central Flow Management Unit
CNS	Communication, Navigation & Surveillance
DOD	Detailed Operational Description
DST	Decision Support Tools
E-ATMS	European Air Traffic Management System
EFD	ETFMS Flight Data
ER ATC System	Integrated system providing service at a level of ATC Centre
ETFMS	Enhanced Tactical Flow Management System
ETO	Estimated Time Over (a significant point)
FDPS	Flight Data Processing System
HMI	Human-Machine Interface
INTEROP	Interoperability Requirements
MTCD	Medium-Term Conflict Detection
IOP	Interoperability
NM	Network Manager
NMF	Network Management Function
NMOC	Network Manager Operations Centre
NOP	Network Operations Plan
OFA	Operational Focus Area

Term	Definition
ONL	On Line
SESAR	Single European Sky ATM Research Programme
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
SFPL	System Flight Plan
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
STAM	Short-Term ATFCM Measures
TAD	Technical Architecture Description
TRACT	Trajectory Adjustment Through Constraint of Time

2 System Description

This section provides a high level description of the selected technology supporting the processes and services defined in the P04.07.01 D68 Step1 V3 Final Complexity Management OSED [11]

2.1 Introduction

The intent of interoperability requirements is to establish the minimum requirements that all interacting systems shall apply in order to operate together as intended, and perform their intended functions in support of the operational services related to the operational scenarios described in the 04.07.01 OSED [11].

The interacting **systems** concerned by this **interoperability** in SESAR step 1 within the OFA 05.03.04 'Enhanced ATFCM Processes', are deduced from the 04.07.01 OSED [11] namely:

- The En Route ATC System;
- The ETFMS service from NMOC (former CFMU).

The following figure describes the functional decomposition and the logical data flows between functions for the understanding of each system interrelations[2].

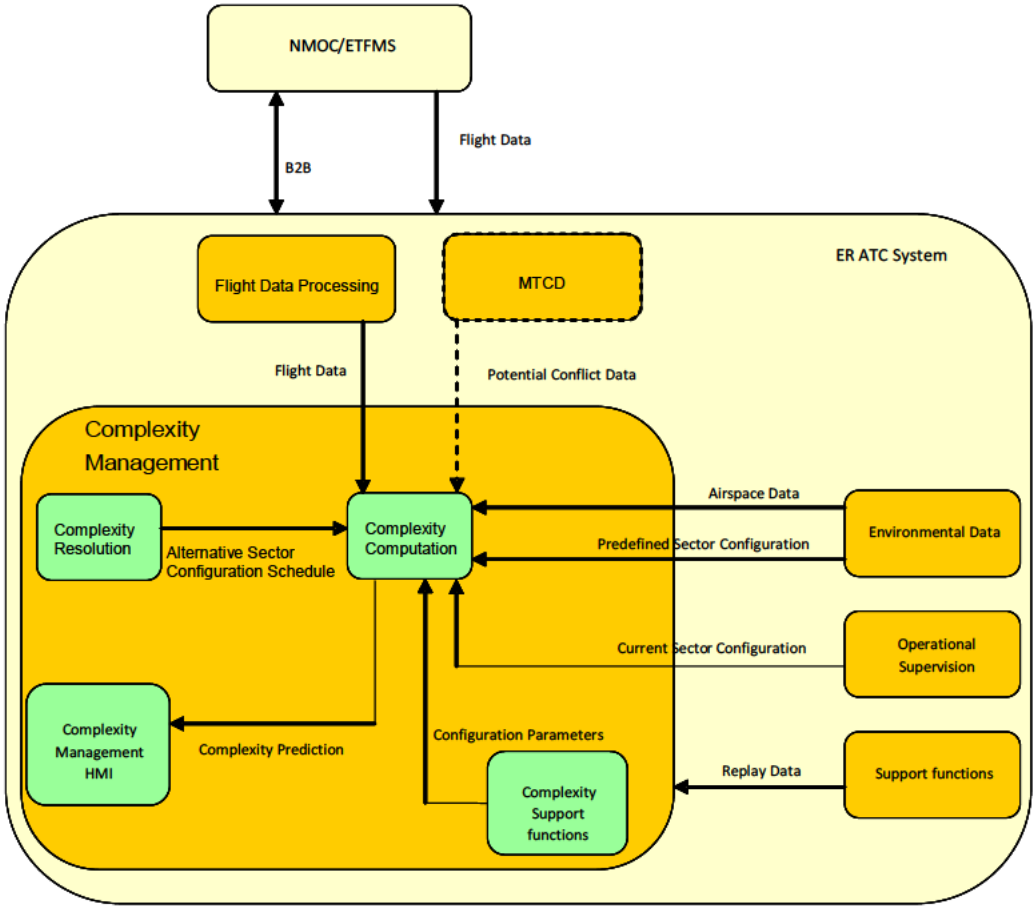

Figure 1 : Complexity Management functional decomposition[3]

[2] Please note that this figure has been developed in coordination with P10.08.01 team involved in the Step1 prototype development and is based on the functional decomposition from P10.01.07 TAD [12].

[3] In this figure, dot line is used to identify optional functionalities. So, the dot line from the MTCD means that it provides potential conflict data to assess complexity only when algorithmic approach is used.

2.2 Function Description

2.2.1 Complexity Computation

This function is capable of predicting traffic complexity over the area of operations. Different approaches are used to achieve this goal:

- Algorithmic approach;
- Cognitive approach;
- Lyapunov/Convergence approach.

2.2.2 Complexity Support Functions

This Complexity Support functions are involved in:

- The calibration parameters to adapt the complexity computation to the environment;
- The creation of the sector configuration schedule.

2.2.3 Complexity Management HMI

After the complexity computation, the airspace configuration forecast and the complexity indicators are displayed in a HMI allowing the operator to analyse the complexity forecast for the next three hours.

2.2.4 Complexity Resolution

When an overload is present a tool allowing minimizing the problem is needed. Different approaches are used to achieve this goal:

- A complete manual human driven approach;
- An automated approach where the complexity tool provides solutions for complexity resolution.

2.2.5 Flight Data Processing

The Flight Data Processing (FDP) function is involved in the provision of the Complexity Management function with flight data information (Flight plan data and 4D trajectory).

2.2.6 MTCD

The function Medium Term Conflict Detection is involved in the provision of potential conflict data to assess and predict complexity only when algorithmic approach is used.

2.2.7 Environmental Data

This function allows obtaining ER ATC System configuration data defined offline.

2.2.8 Operational Supervision

The Operational Supervision is in charge of the configuration of control capabilities of the ER ATC system (Sectorisation, allocation of control roles, resources, etc).

2.2.9 Support Functions

The Support functions are involved in the provision of the off-line recorded data necessary for replay.

2.3 Data flow description

The data flows addressed in this section (and also in diagrams of the previous sections) present a "logical" view of the data exchanges between functions or systems.

A Between Complexity Management sub-functions

Origin	Destination	Data Flow	Description
Complexity Computation	Complexity Management HMI	Complexity prediction	Complexity computation for each sector of the scheduled sector configuration plans for a time window of 3 hours.
Complexity Support functions	Complexity Computation	Configuration Parameters	The scheduled sector configuration plan and parameters to calibrate the Complexity Computation function.
Complexity Resolution	Complexity Computation	Alternative Sector Configuration Schedule	In case of overload an alternative sector configuration schedule is proposed for complexity computation.

Table 2: Complexity Management sub-functions

B Between Complexity Management sub-functions and ER ATC functions

Origin	Destination	Data Flow	Description
Flight Data Processing	Complexity Computation	Flight Data	Flight plan information and 4D trajectory.
Support functions	Traffic Complexity Management	Replay Data	ER ATC System data recorded for replay.
Operational Supervision	Complexity Computation	Current Sector configuration	The sector configuration currently in use.
Environmental Data	Complexity Computation	Airspace Data	Airspace configuration including points, elementary sectors, sector configuration and volumes.
MTCD	Complexity Computation	Potential Conflict Data	Information about conflicts.
Environmental Data	Complexity Computation	Predefined Sector configuration	List of possible sector configuration predefined in the ER ATC System.

Table 3: Complexity Management / ER ATC functions

C Between Complexity Management sub-functions and other ATM systems

Origin	Destination	Data Flow	Description
NMOC/ETFMS	ER ATC System	Flight Data	Flight Data information coming from NMOC/ETFMS through EFD messages.

Table 4 : Complexity Management / other ATM systems[4]

Note that considering the risk of changing automatically the sector configuration, this action will be done by the "operational supervisor".

[4] The CAR system obtains information regarding the traffic demand from the ETFMS (NMOC system) in order to assess workload.

2.4 Integration of EFD messages in the CAR

The CAR-FDP Subsystem shall integrate the EFD processing in order to enhance the quality of the local traffic demand which is used to assess complexity.

The following mechanism to process the EFD messages shall be implemented:

Stage 1: From the reception of the first EFD message (can be up to 20h before the EOBT) up to the creation of the system flight plan in the ONL-FDPS (typically 80 mins before AoR entry).

The first EFD message triggers the creation of the SFPL in the CAR-FDP Subsystem based fully on information extracted from the EFD (route, levels, time, etc).

Note: The EFD does not contain speed information. The CAR-FDP Subsystem shall derive the speed information from the aircraft type using FDPS algorithms.

If the aircraft type is unknown, the CAR-FDP Subsystem shall derive the speed information from the time information of the trajectory points in the EFD.

Stage 2: From the creation of the system flight plan in the FDPS (typically 80 mins before AoR entry) up to the reception of an ABI or ACT message (30-15 mins before AoR entry).

On activation of the SFPL, the information will be updated with data from the EFD message by taking as reference the time associated to the first point known in the ER ATC Centre subject to CAR and performing ETO recalculation, with the exception that now the speed information is taken from the ONL SFPL.

3 Interoperability Requirements

3.1 Requirements for ATS CNS/ATM Applications

This section of the document provides a general description of the ATM technologies applied to this implementation.

The Complexity Management function does not use CNS applications. Only communications between ground-ground exists.

As shown in Figure 1 the only external data flow comes from NMOC/ETFMS. This flow contains information about SFPL updates or modifications.

3.1.1 GROUND-GROUND

According to 4.7.1 OSED [11], the following capabilities will be deployed to support Step 1 in the Ground Domain:

- ER ATC System communications: As this coordination is inside the boundaries of the ATC System, no external interface exists for this purpose with the rest of the domains, so there are no related requirements.
- ER ATC System – NMOC/ETFMS communication: To perform the Complexity Computation, information coming from NMOC/ETFMS is needed. This information is sent by NMOC/ETFMS function through:
    - an EFD message in ADEXP format using the AFTN protocol. The standards for EFD messages in ADEXP format and AFTN protocol are described in [8][9][10];
    - a B2B service.

Additional communications between ER ATC System and NMOC/ETFMS will be established by means of B2B services in order to support the STAM processes at local level.

3.1.1.1 Group 01: Complexity Management

The following interoperability requirements are related to Complexity Management:

[REQ]

Identifier	REQ-04.07.01-INTEROP-0001.0001
Requirement	The system shall be able to accept and process the AFTN EFD (ETFMS Flight Data) messages from the ETFMS.
Title	Reception from NMOC/ETFMS
Status	<Validated>
Rationale	EFD information is needed to compute complexity.
Category	<Interoperability>
Validation Method	<Real Time Simulation>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-0005.0002	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA05.03.04	N/A
<ALLOCATED_TO>	<Functional block>	Local Traffic Complexity Management (LTCM)	N/A
<ALLOCATED TO>	<Enabler>	NIMS-37	N/A
<ALLOCATED TO>	<Enabler>	PRO-220a	N/A

[REQ]

Identifier	REQ-04.07.01-INTEROP-0001.0002

Requirement	The system shall be able to accept and process the traffic data from the Network Management system via B2B services.
Title	Reception of traffic data from Network Management system via B2B services
Status	<Validated>
Rationale	EFD information is needed to compute complexity.
Category	<Interoperability>
Validation Method	<Shadow Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-0005.0002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0003	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0004	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA05.03.04	N/A
<ALLOCATED_TO>	<Functional block>	Local Traffic Complexity Management (LTCM)	N/A
<ALLOCATED TO>	<Enabler>	NIMS-37	N/A
<ALLOCATED TO>	<Enabler>	PRO-220a	N/A

3.1.1.2 Group 02: Communication with Network Management system

The following interoperability requirements are related to the communications between the complexity tool and the Network Management system.

The following interoperability requirements are related to communication with Network Management system.[5]

[REQ]

Identifier	REQ-04.07.01-INTEROP-REL5.0001
Requirement	The system shall be connected to Network Management system to support the communication between actors needed during the STAM processes.
Title	Network Management communication
Status	<Validated>
Rationale	The communication between the different actors during the STAM process will be made through the Network Management framework. EXE-13.02.03-VP-700 addressed the information exchange aspects related to the CM-0103-A OI step through B2B services (within the SESAR Solution #17 framework).
Category	<Interoperability>
Validation Method	<Shadow Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0003	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0004	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0005	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA05.03.04	N/A
<ALLOCATED_TO>	<Functional block>	Local Traffic Complexity Management (LTCM)	N/A
<ALLOCATED TO>	<Enabler>	PRO-220b	N/A

[5] Please note that the P04.07.01 validation activities were performed at local level, and so, the exchange of information with ATFCM through SWIM services was an assumption taking also into account that the validation objectives could be achieved without SWIM.

[REQ]

Identifier	REQ-04.07.01-INTEROP-REL5.0002
Requirement	The system shall use the B2B services provided by the Network Management system to communicate with all the actors involved during the STAM process.
Title	B2B services communication
Status	<Validated>
Rationale	All the actors communicate with each other using the B2B services provided by Network Management system. EXE-13.02.03-VP-700 addressed the information exchange aspects related to the CM-0103-A OI step through B2B services (within the SESAR Solution #17 framework).
Category	<Interoperability>
Validation Method	<Shadow Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0003	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0004	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA05.03.04	N/A
<ALLOCATED_TO>	<Functional block>	Local Traffic Complexity Management (LTCM)	N/A
<ALLOCATED TO>	<Enabler>	PRO-220b	N/A

[REQ]

Identifier	REQ-04.07.01-INTEROP-REL5.0003
Requirement	The system shall be connected to a meteorological provider in order to get the most recent meteorological information to assess the air traffic situation complexity
Title	Meteorological information
Status	<Deleted>
Rationale	The communication with the meteorological information allows the system to use it to improve the accurate of the complexity calculations. However, the integration of meteorological information to improve complexity assessment has been considered in Step 2 (CM-0103-B).
Category	<Interoperability>
Validation Method	<Shadow Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-04.07.01-OSED-REL5.0012	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA05.03.04	N/A
<ALLOCATED_TO>	<Functional block>	Local Traffic Complexity Management (LTCM)	N/A

3.2 Dynamic functions / operations

There are no dynamic aspects to be listed.

3.3 Unique characteristics

There are no unique characteristics to be listed.

4 References

4.1 Applicable Documents

This INTEROP complies with the requirements set out in the following documents:

[1] ATM Master Plan, Data Set 15, December 2015;

[2] IS SESAR Template Toolbox, Ed. 03.01.03

[3] IS SESAR Requirements and V&V Guidelines, Ed. 03.01.00

4.2 Reference Documents

The following documents were used to provide input/guidance/further information/other:

[4] ED-78A Guidelines for Approval of the provision and use of Air Traffic Services supported by Data Communications

[5] ICAO Document 9694

[6] P04.02 D98 'WP4 Detailed Operational Description Step1', Ed. 00.07.01

[7] P07.02 D29 'Step1 Release5 Detailed Operational Description (DOD)', Ed. 00.04.01

[8] AFTN ICAO Annex 10 - Aeronautical Tele-communications Volume 2

[9] Standard document for ATS Data Exchange Presentation (ADEXP), EUROCONTROL, Edition 3.0

[10] ATFCM User's Manual, EUROCONTROL, Edition 15.0

[11] P04.07.01 D68 'Step1 V3 Final Complexity Management OSED', Ed 00.02.00

[12] P10.01.07 D120 Technical Architecture Description – Cycle 2015, Ed. 00.01.00

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