

European ATM Service Description for the ARESRelease Service

Document information

Project Title Information Service Modelling deliverables

Project Number 08.03.10

Project Manager NORACON

Deliverable Name European ATM Service Description for the ARESRelease Service

Deliverable ID D65

Edition 00.04.01

Template Version 02.00.02

Task contributors

DFS, EUROCONTROL, NORACON, NATMIG, FINMECCANICA, FREQUENTIS, THALES, ENAIRE, DSNA, INDRA, SEAC and ENAV

Abstract

The ARESRelease service notifies the release of a de-activated ARES to the concerned ACCs. This document is based on the service model designed in the ISRM repository (Ref [10]).

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Rational for rejection		
N/A		

Document History

Edition	Date	Status	Author	Justification
00.00.01	19/07/2012	Draft		First version
00.00.02	24/07/2012	Draft		Added the verification findings
00.01.00	30/07/2012	Final		Updated after 08.03.10 input
00.01.01	28/09/2012	Revision		Added diagram to trace data types to NSV11b
00.01.02	06/01/2013	Revision		Updated according to the 08 03 10-D07 SJU assessment report V2
00.01.03	25/11/2013	Revision		Updated according to the latest SDD template
00.01.04	14/05/2014	Revision		Updated the model according to the ISRM Foundation Version 00.03.10 and according to SJU assessment report on ISRM V1.0



00.02.00	30/05/2014	Final	Incorporating final review comments and prepared for final approval for delivery
00.02.01	15/05/2014	Final	Updated according to the SJU Assessment report on ISRM 1.1
00.03.01	22/04/2016	Draft	Updated according to the ISRM Foundation version 00.00.07
00.03.02	30/05/2016	Final	Updated according to the Reviewer comments
00.04.00	01/06/2016	Final	Final version for ISRM 2.0 delivery.
00.04.01	20/07/2016	Final update	Updated according to 08.03.10- D65_SJU_Assessment_ report reponse

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This deliverable consists of SJU foreground.



Table of Contents

EXECUTIVE SUMMARY	6
1 INTRODUCTION	7
1.1 PURPOSE OF THE DOCUMENT 1.2 INTENDED READERSHIP 1.3 INPUTS FROM OTHER PROJECTS 1.4 GLOSSARY OF TERMS 1.5 ACRONYMS AND TERMINOLOGY 1.5.1 Acronyms 1.5.2 Terminology	
2 SERVICE IDENTIFICATION	10
3 OPERATIONAL AND BUSINESS CONTEXT	11
3.1 INFORMATION EXCHANGE REQUIREMENTS	
4 SERVICE OVERVIEW	
4.1 SERVICE TAXONOMY	
5 SERVICE INTERFACE SPECIFICATIONS	18
5.1 Service Interface ARESReleaseInterface	
6 SERVICE DYNAMIC BEHAVIOUR	24
6.1 Service Interface ARESReleaseInterface	24
7 SERVICE PROVISIONING (OPTIONAL)	25
8 VALIDATION AND VERIFICATION	26
8.1 VERIFICATION	26
9 REFERENCES	27



List of tables

Table 1: IER covered by the ARESRelease service	11 12 17 23
List of figures	20
Figure 1: NAV ARESRelease Requirements Traceability IER diagram	12 13
Figure 3: NOV-2 ARESRelease Service to Nodes Mapping diagram	14 15 16
Figure 7: NSOV-2 ARESRelease Interface Parameter Definition diagram	



Executive summary

The current document describes the logical model of the ARESRelease service. It is the result of the "Service Design" step of the B.4.3 Working Method on Services. The Service Design has been performed in the context of Service Activity SV008 entailing Airspace Management and Advanced Flexible Use of Airspace.

The ARESRelease service supports the coordination of the release of an ARES between the responsible ASM and the concerned ACCs in SESAR Step 1 as described in the AFUA OSED (Ref [11]). It is part of the Commission Pilot Common Project in the SWIM section under the label "Notification of the release of an Airspace Reservation/Restriction (ARES)" (Ref [13]).

The design complies with the ISRM Foundation 00.07.00 and it is part of the ISRM V2.0 (Ref [10]).



1 Introduction

1.1 Purpose of the document

This document provides a holistic view of the ARESRelease service and its building blocks complementary to the UML model of the service available in the ISRM (ref [10]).

The service is part of the ISRM Service Portfolio (ref [9]) where the services are presented at a high level.

Additionally this document supports the configuration management process by providing well-defined baselines of the service.

1.2 Intended readership

This document is intended to be read by Enterprise Architects, Service Architects, Information Architects, System Engineers and Developers in pursuing architecting, design and development activities.

1.3 Inputs from other projects

Step 1 AFUA OSED [11] and the AFUA SPR [12] developed by P07.05.04.

1.4 Glossary of terms

All terms in this document are defined in the AFUA OSED [11].

1.5 Acronyms and Terminology

1.5.1 Acronyms

Term	Definition	
ACC	Area Control Centre	
ADD	Architecture Description Document	
ARES	Airspace Reservation/Restriction	
ASM	Airspace Management	
AUP	Airspace Use Plan	
ATC	Air Traffic Control	
АТМ	Air Traffic Management	
BPMN	Business Process Modelling Notation	
ССВ	Change Control Board	
CDM	Collaborative Decision Making	
CONOPS	Concept of Operations	



Term	Definition	
CR	Change Request	
CWP	Controller Working Position	
DOD	Detailed Operational Description	
EAEA	European ATM Enterprise Architecture	
EAUP	European Airspace Use Plan	
FOC	Full Operational Capability	
IER	Information Exchange Requirement	
ЮС	Initial Operational Capability	
ISRM	Information Service Reference Model	
NAF	NATO Architecture Framework	
NSOV	NATO Service Oriented View	
NOV	NATO Operational View	
NSV	NATO System View	
OFA	Operational Focus Group	
OSED	Operational Service and Environment Definition	
QoS	Quality of Service	
SESAR	Single European Sky ATM Research Programme	
UML	Unified Modelling Language	
UUP	Updated Use Plan	
VPA	Variable Profile Area	
woc	Wing Operation Centre	

1.5.2 Terminology

Term	Definition	Source
Airspace Management	The Airspace Management (ASM) is a planning function with the primary objective of maximising the utilisation of available airspace by dynamic time-sharing and, at times, the segregation of airspace among various categories of users	OSED [11]



Term	Definition	Source
	based on short-term needs.	
Airspace Reservation	A defined volume of airspace temporarily reserved for exclusive or specific use by categories of users.[7]	OSED [11]
Capability	Capability is the ability of one or more of the enterprise's resources to deliver a specified type of effect or a specified course of action to the enterprise stakeholders.	EATMA Guidance Material [8]
Capability Configuration	A Capability Configuration is a combination of Roles and Systems configured to provide a Capability derived from operational and/or business need(s) of a stakeholder type.	EATMA Guidance Material [8]
Node	A logical entity that performs Activities. Note: nodes are specified independently of any physical realisation.	EATMA Guidance Material [8]
Service	The contractual provision of something (a non-physical object), by one, for the use of one or more others. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures.	
Service function	A type of activity describing the functionality of a Service.	EATMA Guidance Material [8]
Service interface	The mechanism by which a service communicates	EATMA Guidance Material [8]



2 Service identification

Name	ARESRelease
ID	{C61A8EC9-14DA-4f15-8443-3177EF6AE6EF}
Version	2.0
Keywords	AFUA, ARES, allocation, ASM, notification, release
Architect(s)	EUROCONTROL

Lifecycle status	Date	References	
Identified	06/07/2012	See reference [14]	
Allocated	22/08/2012	See reference [15]	
Designed	30/9/2012	This document	
Validated	Date when validated. Filled by WP3	Name of protocol documenting the decision	
IOC	Date for Initial Operational Capability	Reference to technical enabler hosting the service in the ATM master plan	
FOC	Date for Full Operational Capability	Reference to technical enabler hosting the service in the ATM master plan	

3 Operational and Business context

The ASM Support System notifies the concerned ATCs that the ARES is released once the confirmation-acknowledgement process for deactivation is completed and the current time reaches the end time of the ARES. The ATC system updates the status of the ARES on the CWP to "Inactive"

Limitations:

The current OSED does not clearly illustrate the 'Release Airspace' process, bundling it to an extent within the 'Deactivate Airspace' scenario. It is recommended that this process is clearly delineated, and an use case created to support its execution.

The current **OSED** does not cover the following

- Appropriate Authority not clear if this is an authorised airspace user and / or supervisor
- Not clear if an release can be refused after the de-activation has been successful
- Not clear if acknowledgement is necessary (as the CWP is automatically updated to reflect the release)
- Process to be initiated when acknowledgement of release / or update of CWP is not received, is not described
- ➤ The IER does not mention a notification of the ARES release to the ATFCM. This seems odd.

The current **IER** does not cover the following Information exchanges:

- Acknowledgment of release (if needed)
- Response to notification of release (i.e. if refusal is possible)
- Updating of Airspace Status to Inactive

3.1 Information Exchange Requirements

The ARESRelease service covers the following IER (see section 6.2 of the OSED ([11]):

IER id	Name	Issuer	Addressees	Information element
IER-07.05.02- OSED- AcAS.0005	Release of an Airspace	Airspace Manager	ACC/Approach Supervisor	Reference location - ARES (specified in the AUP).(Messages in OLDI)

Table 1: IER covered by the ARESRelease service

Additional operational requirements applicable to this information exchange AFUA SPR ([12]):

Id	Name
REQ-07.05.02-SPR-PERF.0740	Confirmation receipt for messages sent by the Military ATC / Air Defence Systems

Table 2: REQ covered by the ARESRelease service





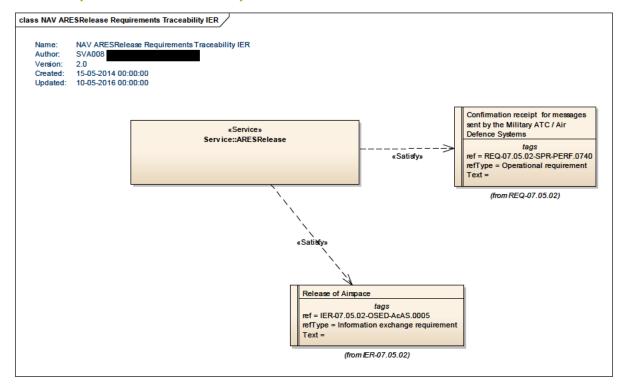


Figure 1: NAV ARESRelease Requirements Traceability IER diagram

3.2 Other Requirements

3.2.1 Non-Functional Requirements

The AFUA SPR ([12]) contains the following requirements for the release of an ARES:

Identifier	Name	Frequen cy	Safety Critical ity	Confidenti ality	Maximum Time of Delivery	Interaction Type
IER- 07.05.02- OSED- AcAS.0005	Release of an Airspace	1	Severe	Restricted	Immediate	Collaboration

Identifier	REQ-07.05.02-SPR-SAFE.0003
	Relevant data exchanges between ASM, ATC, ATFCM and Air Defence shall undergo an encryption process.
Title	Encryption of transmitted data

Table 3: Non-functional requirements



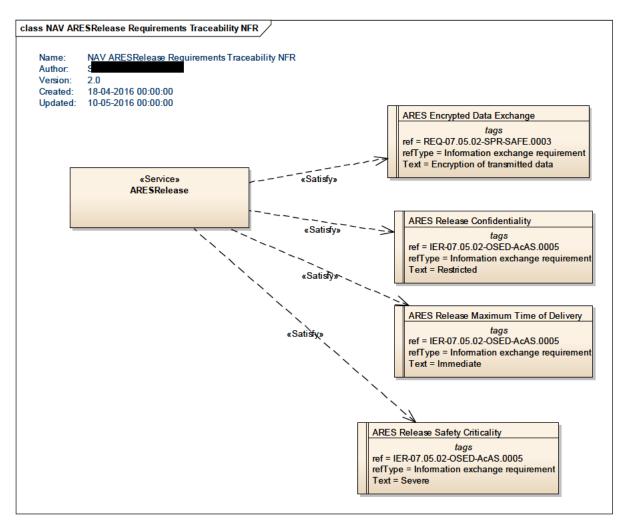


Figure 2: NAV ARESRelease Requirements Traceability NfR diagram

3.2.2 Relevant Industrial Standards

AIXM 5.1 and its e-ASM extension:.

- AIXM is a data exchange specification that uses the Extensible Markup Language (XML) technology in order to define features and messages used to exchange information about the aeronautical data contained in AICM. AIXM 5.1 provides an extensible, modular aeronautical information exchange standard that can be used to satisfy information exchange requirements for current and future aeronautical information applications.
- AICM is a conceptual/logical model that uses entities, attributes and relationships in order to describe aeronautical features such as airports, runways, navaids, obstacles, routes, terminal procedures, airspace structures, services and related aeronautical data.
- e-ASM is an extension to AIXM 5.1 that supports European Airspace Management.
 The eASM specification has been developed to provide a common data model and a common data encoding format for data that needs to be exchanged digitally between tools and systems involved in the dynamic airspace management process.



3.2.3 Nodes

The mappings from the service to the nodes are shown below

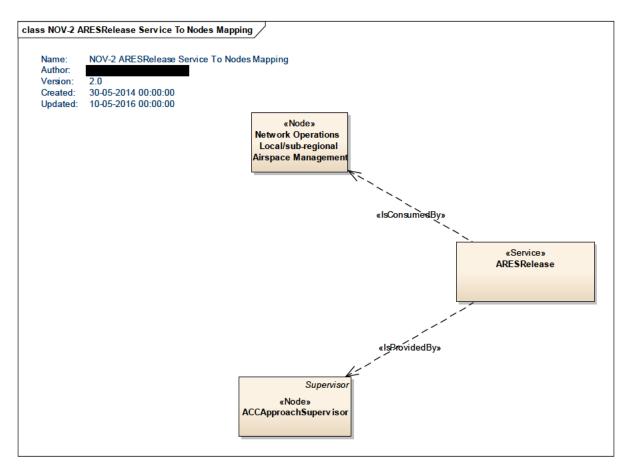


Figure 3: NOV-2 ARESRelease Service to Nodes Mapping diagram

4 Service overview

4.1 Service Taxonomy

The service taxonomy is described in the ISRM Service Portfolio document [9].

4.2 Service Levels (NfRs)

Non-functional requirements are described in section 3.2.1.

4.3 Service Functions and Capabilities

The operational architecture for the tactical ASM, based on the OSED [11], is depecticed in the following two diagrams:

- the EATMA operational activity diagram (NOV-5 view)
- the services to operational activities mapping diagram (NSOV-4 view)

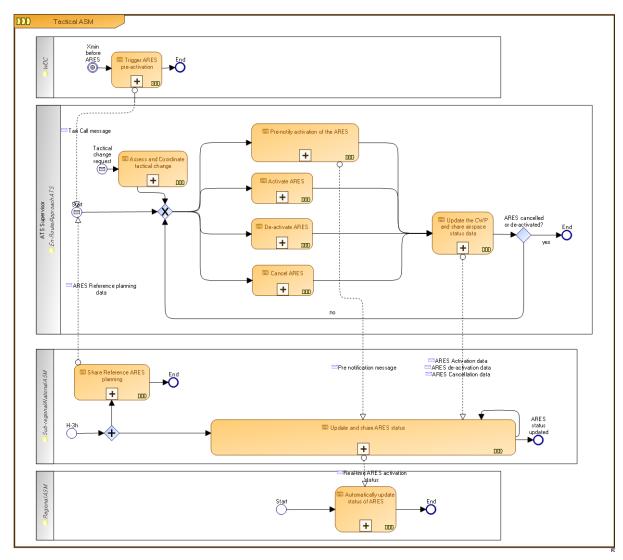


Figure 4: NOV-5 EATMA operational activity for the tactical ASM (ARES activation-deactivation)



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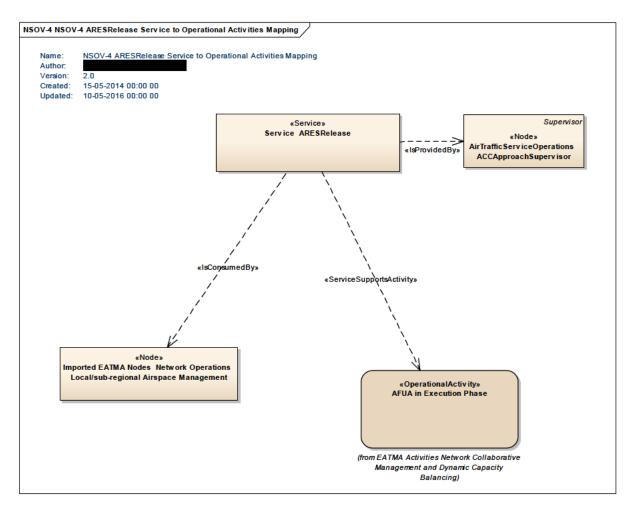


Figure 5: NSOV-4 ARESRelease Service to Operational Activities Mapping diagram



4.4 Service Interfaces

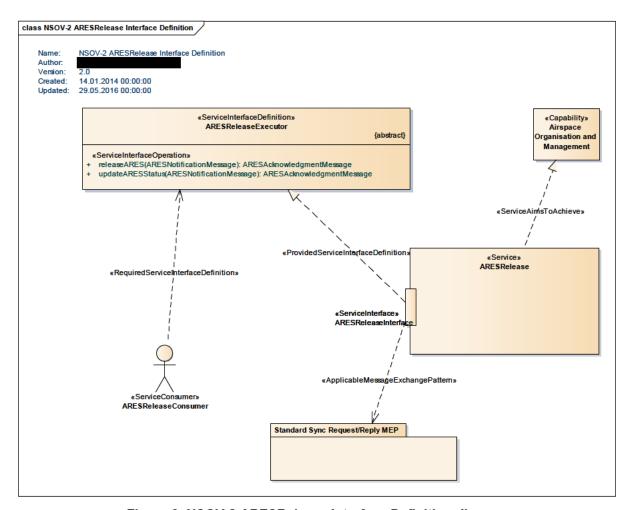


Figure 6: NSOV-2 ARESRelease Interface Definition diagram

ServiceInterface	ServiceInterfaceDefinition	ServiceInterfaceOperation	Role
ARESReleaseInterface	ARESReleaseExecutor	releaseARES	provided
ARESPReleaseInterface	ARESReleaseExecutor	updateARESStatus	provided

Table 4: Service Interfaces

Service interface specifications

This section covers the static design description of the interface while the dynamic design (behaviour) is described in chapter 6.

The ARESRelease service has a single interface with two operations.

The static interface description includes the following architectural elements:

- Service Interface (a single interface for this service)
- Service Interface Definition
- Operations
- Parameters

Constants or variables passed into or out of a Service interface as part of the execution of an Operation.

5.1 Service interface ARESReleaseInterface

The purpose of this Service Interface is to provide a service end-point for the appropriate authority or the actions allocated to it for the ARESRelease sequence. This Service Interface exposes two operations i.e. the releaseARES and the updateARESStatus

5.1.1 Service Interface Definition ARESReleaseExecutor

This Service Interface definition exposes 2 operations:

5.1.1.1 Operation releaseARES

The purpose of this operation is to receive an ARES release notification and confirm its reception.

5.1.1.1.1 Operation Functionality

The operation will check if the ARESNotificationMessage contains a valid request that relates to a deactivated ARES that is covered by the ACC. If both conditions are met, the operation will return an acknowledgment of type Success, otherwise Fail.

5.1.1.1.2 Operation Parameters

Parameters

Input:: ARESNotificationMessage

Output:: ARESAcknowledgmentMessage

Pre-Condition

Concerned ARES i.e. ARES referred to in the ARESNotificationMessage should already have been deactivated.

Post-Condition

The ARES is released.

Failure-Condition

No Acknowledgement message received within the defined response time

For more details on the operation parameters see section 5.2

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18 of 28

5.1.1.2 Operation updateARESStatus

The purpose of this operation is to receive the notification about the release.

5.1.1.2.1 Operation Functionality

The operation will check if the ARESNotificationMessage contains a valid request that relates to an ARES that has been previously deactivated by the ACC and that has been notified as being released. If it is the case, the operation will return an acknowledgment of type Success, otherwise Fail. It will change the status of this ARES to Release in the ACC system.

5.1.1.2.2 Operation Parameters

Parameters

Input:: ARESNotificationMessage

Output:: ARESAcknowledgmentMessage

Pre-Condition

Valid ARESNotificationMessage for release should have been received and the release been accepted.

Post-Condition

The ARES status is set to Release on All affected CWP if the AcknowledgementType is 'Success'

Failure-Condition

The AcknowledgementType is Not 'Success'.

For more details on the parameters, see section 5.2

5.2 Service Interface parameter definition

As the interface parameters are shared by both operations, they are described in this subsection.

5.2.1 ARESNotificationMessage

This is a message of the type ARESNotificationMessage. All ARESNotification Messages must have the following Attributes:

ARESID: String:: possible values: Unique ARES Name

ARESActionType: Enumeration:: possible values: Preactivate | Activate | Deactivate | Activation ARESActionCode: Enumeration:: possible values: Unique Operational Code derived from OSED airspaceManagementCellDesignator: String:: possible values: Unique Airspace User Name airspaceManagementCellType: String:: possible values: The type of Airspace Management Cell timestamp: UTCTimeCode :: possible values : Unique Date and Time to a defined level of granularity

5.2.2 ARESAcknowledgmentMessage

This is a message of the type ARESAcknowledgmentMessage. All ARESNotification Messages must have the following Attributes:





ACCUnitDesignator : String :: possible values : Unique ACC Unit Name

ACCUnitType: String :: possible values: Type of ACC Unit

AcknowledgementType; Enum:: possible values: Success | Fail | Unknown

AcknowledgementCode: Enum:: possible values: Unique Operational Code derived from OSED

ARESID: String:: possible values: Unique ARES Name

Timestamp: UTCTimeCode :: possible values : Unique Date and Time to a defined level of granularity

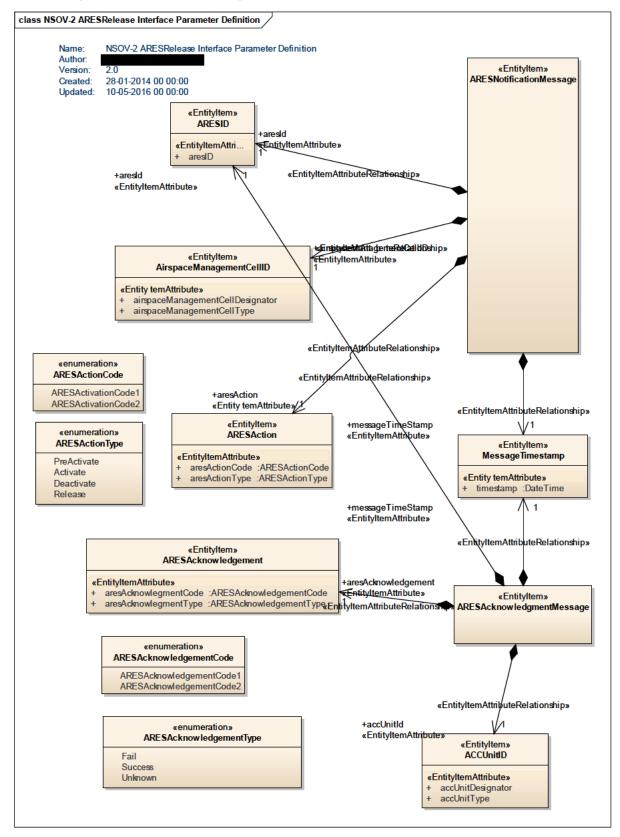


Figure 7: NSOV-2 ARESRelease Interface Parameter Definition diagram

Element Name		Author			Notes				
ARESAcknowledgementCode						possible values : Unique Operational Code to			
					be defined in the OSED				
Element Tagged Value Name			me		Value				
CLDMSemanticTrace					CLDM_	οι	ut_of_scope		
Attribute Name Type			oe -			N	Votes		
ARESAcknowledgementC									
ode1						L			
	Tagged Value Nam			Val					
	CLDMSemanticTrac		CLDM_out_or			_			
	oute Name	Typ	pe			N	Totes		
1 1	SAcknowledgementC								
ode2			1		L				
	Tagged Value Nam			Val					
	CLDMSemanticTrac	e	CLDM_out_o			of			
Element Na			Author			_	Notes		
ARESAckno	wledgementType						Codes for ARES acknowledgment types.		
						_			
	lement Tagged Value	Naı	me		Value				
	LDMSemanticTrace				CLDM_	_	ıt_of_scope		
	oute Name	Typ	pe			N	Totes		
Fail						L			
	Tagged Value Nam	e		Val					
	CLDMSemanticTrac			CL	DM_out_	_			
	oute Name	Typ)e			N	Totes		
Succe						L			
	Tagged Value Nam			Value					
	CLDMSemanticTrac			CLDM_out_of_scope					
Attrik	oute Name	Typ	pe N		N	Votes			
Unkno									
	Tagged Value Nam			Val					
	CLDMSemanticTrac	e			of	scope			
Element Na	me		Author			Notes			
ARESAction	nCode					Unique Operational Codes for actions to be			
							performed by ARES derived from OSED.		
\mathbf{E}	lement Tagged Value	Naı	me Value						
C	LDMSemanticTrace		CLDM_o		οι	ıt_of_scope			
Attrib	oute Name	Тур	pe 1		N	Totes			
ARES	SActivationCode1					Г			
•	Tagged Value Nam	e		Val	lue				
	CLDMSemanticTrac	ce		CLDM out of scope					
	oute Name	Тур	oe .			_	Totes		
ARES	SActivationCode2								
	Tagged Value Nam	e		Val	lue				
CLDMSemanticTrace				CLDM out of			scope		
Element Name Autho			Author				Notes		
ARESActionType						Codes for the type of action to be performed on a ARES.			
Element Tagged Value Name			me		Value		on a rings.		
CLDMSemanticTrace				01	it of scope				
	Attribute Name Type			CEBINI_	_	lotes			
		- Jr				1	iotes		
PreActivate Tagged Value Name				Vel	1116				
CLDMSemanticTrace				Value CLDM out of scope			scope		
			10	CL.	Divi_out_		lotes		
Attribute Name Type Activate						1	iotes		
Activa	Tagged Value Name			Val	110	_			
I	Tagged value Nam	C		v al	ue				

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	CLDMSemanticTrace		CLDM_out_of_scope	
Attrib	ute Name	Type		Notes
Deacti	vate			
	Tagged Value Name		Value	
	CLDMSemanticTrace		CLDM_out_of_scope	
Attrib	Attribute Name			Notes
Releas	Release			
	Tagged Value Name		Value	
	CLDMSemanticTrace		CLDM_out_of_scope	

Table 5: Payload tracing to AIRM

6 Service dynamic behaviour

6.1 Service Interface ARESReleaseInterface

The Service Behaviour consists of the following flow:

- The ARESReleaseConsumer initiates the releaseARES operation, in synchronous mode, of the Relevant ACC / Authorised Authority Service End-Point to request the release of an ARES
- The ARESReleaseConsumer gets the respond of the releaseARES operation with an appropriate ARESAcknowledgmentMessage
- The ARESReleaseConsumer initiates the updateARESStatus operation, in synchronous mode, to update the status of the ARES at the Relevant ACC / Authorised Authority.
- The ARESReleaseConsumer gets the respond of the updateARESStatus operation with an appropriate ARESAcknowledgmentMessage

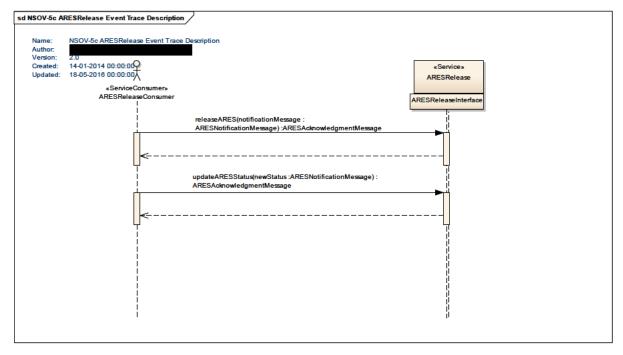


Figure 8: NSOV-5c ARESRelease Event Trace Description

7 Service provisioning (optional)

N/A



8 Validation and Verification

8.1 Verification

Verification performed according to the ISRM Rulebook [6] following the ISRM Verification Guidelines [7]. This includes use of verification scripts. Verification is partly automatic, partly semi-automatic and partly manual.

8.1.1 Verification Results

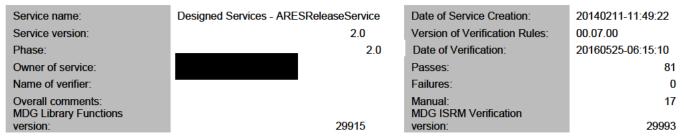


Table 6: Verification results overview

The verification reports for the service can be found in the Verification Reports directory located in the D65 delivery package [16].

Designed_Services_-_ARESReleaseService.xls

Designed_Services_-_ ARESReleaseService _Common.xls

Based on the results in the verification reports the service has been successfully verified.

8.2 Validation

No validation exercise has used this service.

9 References

Name	Version	Document ID / Location
[1] Project deliverables template	03.00.00	SJU templates & guidelines package, Project deliverables template
[2] SESAR Operational Service and Environment Definition	03.00.00	SJU templates & guidelines package, OSED template
[3] SESAR Safety and Performance Requirements	03.00.00	SJU templates & guidelines package, SPR template
[4] ISRM Tooling Guidelines	00.07.00	08.03.10 D44
[5] ISRM Modelling Guidelines	00.07.00	08.03.10 D44
[6] ISRM Foundation Rulebook	00.07.00	08.03.10 D44
[7] ISRM Verification Guidelines	00.07.00	08.03.10 D44
[8] European ATM Architecture (EATMA) Guidance Material v4	00.04.02	B.04.01 D66
[9] ISRM Service Portfolio	00.08.01	08.03.10 D65
[10] ISRM 2.0 SESAR EA Enterprise Architect model	2.0	08.03.10 D65 ISRM2.0-model
[11] Advanced Flexible Use of Airspace for Step 1 OSED	00.04.00	07.05.04 D45
[12] Advanced Flexible Use of Airspace Safety and Performance Requirements for Step 1	00.03.05	07.05.04 D47
[13] COMMISSION IMPLEMENTING REGULATION (EU) No 716/2014 of 27 June 2014 on the establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan	27 June 2014	http://eur-lex.europa.eu/legal- content/EN/TXT/?uri=uriserv%3AOJ.L .20 14.190.01.0019.01.ENG
[14] European ATM Service Identification for the Advanced Use of Flexible Use of Airspace	V1.0	08.03.05
[15] B.4.3 AFUA Service Allocation FT09	00.00.03	B.04.03
[16] Verification reports for the service	N/A	08.03.10 D65 Verification reports



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