European ATM Service Description for the RunwayMixSequence Service

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Abstract

This document describes the SESAR Airport related Services identified by Project 08.03.10 as part of the work for ISRM iteration 1.1 and updated for the ISRM iteration 2.0.These services represent the way of managing the runway mix sequence and are justified by Operational Requirements taken from the OSED developed by Project 06.08.04.

The service identified covers the operations dealing with the subscription and publication of the runway mix sequence. The proposed service is called the RunwayMixSequence Service, the service provides the runway mix sequence information. This service enables the interested stakeholders to receive the runway operating in mixed mode,sequence information.

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Rational for rejection

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Executive summary

This document is the result of the activity “Service Design” for Fast Track 11 on the arrival sequence for the mix runways. It covers the design of the service *RunwayMixSequence* following the new version of the ISRM Modelling Guidelines [5], covering the set of requirements written in the 6.8.4 OSED [11] and the Information Exchange Requiment detailed in [10].

The *RunwayMixSequence* service is in charge of publishing the mix sequence data to the interested stakeholders.

1 Introduction

The services described in this document arise from the OSED developed by project 06.08.04 (see reference [10]) describing the Coupled AMAN/DMAN.

1.1 Purpose of the document

The purpose of this Service Description Document (SDD) is to provide a complete logical description of the RunwayMixSequence Service, its operational context, its basic architectural features, its dynamical aspects, its operations and the data provided. All these aspects are presented as model views according to the ISRM UML EATMA Profile, which organize knowledge about a service into views inspired by the NAF Framework.

This SDD services as a complement to a model based description and supports the configuration management process by providing well-defined baselines.

The logical service model presented in this SDD edition is part of the ISRM 2.0 release, and provides a blueprint which service developers must follow in order to create SWIM-Compliant implementations of the RunwayMixSequence Service.

The service presented will be a part of the Service Portfolio. The Service portfolio presents all services that are available or is planned to become available at a high level.

1.2 Intended readership

This service description 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

N.A

1.4 Glossary of terms

This section identifies terms not covered in one or more referenced documents and a proposed definition.

Term	Definition
Mixed mode operations	Operation for departures and arrivals between runways and traffic types.

1.5 Acronyms and Terminology

1.5.1 Acronyms

Term	Definition
AMAN	Arrival Manager
APP	Approach

Term	Definition
ATC	Air Traffic Control
ATM	Air Traffic Management
DMAN	Departure Manager
EA	Enterprise Architect
E-OCVM	European Operational Concept Validation Methodology
FAA	Federal Aviation Administration
FOC	Full Operational Capability
FT	Fast Track
ICAO	International Civil Aviation Organization
IER	Information Exchange Requirement
IOC	Initial Operational Capability
ISRM	Information Service Reference Model
NAF	NATO Architecture Framework
NSOV	NATO Service Oriented View
NOV	NATO Operational View
OSED	Operational Service and Environment Definition
SESAR	Single European Sky ATM Research Programme
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SWIM	System Wide Information Management
TLDT	Target Landing Time
TTO	Target Time Over
TTOT	Target Take Off Time
UML	Unified Modelling Language

1.5.2 Terminology

Term	Definition	Source
Capability	The collective ability to deliver a specified type of effect or a specified course of action. Within the context of the SESAR Programme a capability is therefore the ability to support the delivery of a specific operational concept to an agreed level of performance.	Common working meeting between B41 EA study and B43 T5
Capability Configuration	A combination of organisational aspects (with their competencies) and equipment that combine to provide a capability. A Capability Configuration represents a recognisable set of resources (technical systems, human roles, and physical assets) derived from a generic stakeholder organisation.	B43 ADD
Node	A logical entity that performs Operational Activities specified independently of any physical realisation e.g. a stakeholder type providing and/or consuming operational information within a network of others. Note: Node is a term used in NAF. The equivalent SoaML stereotype to be used is Participant. Be aware that the original intention of SoaML is that Participants are physical items and not logical constructs. Service architects must indicate whether the Participant is a logical (Node) or a physical (Capability Configuration) construct.	Common working meeting between B41 EA study and B43 T5
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.	B43 T5 study
Service attribute	A Service Attribute defines a property of a service. Examples: Response time, Frequency of invocation, Message Exchange Pattern.	B43 T5 study
Service contract	A service contract represents an agreement between the stakeholders involved for how a service is to be provided and consumed.	B43 T5 study
Service function	A Service function describes what functionality is needed to provide or consume a service; it is the trigger for or is triggered by the Service interactions. A Service function can be automated to different extents depending on the context e.g. a Service function supporting a complex activity may need more automation than a Service function for a simple activity. Note: The equivalent SoaML stereotype is Capability, in WP8 Foundation documentation referred to as Service Capability.	B43 T5 study

Term	Definition	Source
Service interaction	A Service interaction is a description of an information exchange between ATM stakeholders' systems which can potentially be automated; phone calls / voice exchanges are considered as non-automated service interactions. In considering automated interactions, a service interaction is described by several modelling artefacts depicting the static and dynamic behaviour of a service. This includes service operations, data messages model and interaction behaviour.	B43 T5 study
Service interface	The mechanism by which a service communicates. Service providers and consumers need to implement service interfaces to be able to collaborate. A service interface includes service operations that enable access to the functionality of the services identified, as well as the data used in the service interaction.	B43 T5 study

2 Service identification

Name	RunwayMixSequence
ID	{F23B11ED_6E2E_4911_B769_DB5DA9346D27}
Version	1.0
Keywords	Runway, Sequence, AMAN, DMAN
Architect(s)	[redacted] Indra

Lifecycle status	Date	Reference
Identified	17/07/2013	See reference [14]
Allocated	24/06/2013	FT11 analysis
Designed	30/05/2014	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 operational context and requirements are available from operational project 06.08.04. The 06.08.04 OSED [11] does supply some requirements which have been linked to the information exchange requirements detailed in [10].

3.1 Information Exchange Requirements

The service is supporting the following DOD requirements detailed in [11]:

Relevant OI Steps ref. (coming from the definition phase)	Contribution to the OIs short description	Operational Focus Area name	Story Board Step
TS-03091	Integration of Departure and Arrival Management (Integrated Arrival and Departure Sequencing up to the Runway)	OFA04.01.01 Integrated AMAN DMAN	2

Table 1. DOD requirements for the RunwayMixSequence Service

Derived from this DOD requirement, the service is implementing the followings IERs depicted in [10].

Identifier	Name	Issuer	Intended Addressees	Information Element	Involved Operational Activities	Status	Rationale	Satisfied DOD Requirement Identifier
IER-06.08.04-OSED-0201.0130	TLDT	Coupled AMAN/DMAN	Approach controller	TLDT (Target Landing Time)	Runway sequence output	<In Progress>	TLDT is provided by the coupled AMAN/DMAN and used by ATCO in charge of arrival clearance	REQ-06.02-DOD-6200.0058
IER-06.08.04-OSED-0201.0140	TTOT	Coupled AMAN/DMAN	Tower runway controller	TTOT (Target Take-Off Time)	Runway sequence output	<In Progress>	TTOT is provided by the coupled AMAN/DMAN and used by ATCO in charge of providing departure clearance	REQ-06.02-DOD-6200.0058
IER-06.08.04-OSED-0201.0170	sequence for approach ATCOs	Coupled AMAN/DMAN	Approach controller	integrated runway sequence	Runway sequence computation	<In Progress>	Integrated arrival/departure sequence is presented to the ATCO in charge of arrival flights	REQ-06.02-DOD-6200.0270 REQ-06.02-DOD-6200.0058
IER-06.08.04-OSED-0201.0180	sequence for departure ATCOs	Coupled AMAN/DMAN	Tower runway controller	integrated runway sequence	Runway sequence computation	<In Progress>	Integrated arrival/departure sequence is presented to the ATCO in charge of departure flights	REQ-06.02-DOD-6200.0270 REQ-06.02-DOD-6200.0058

Table 2. IER requirements for the RunwayMixSequence Service

The following diagram reflects this relationship between the service and the IERs:

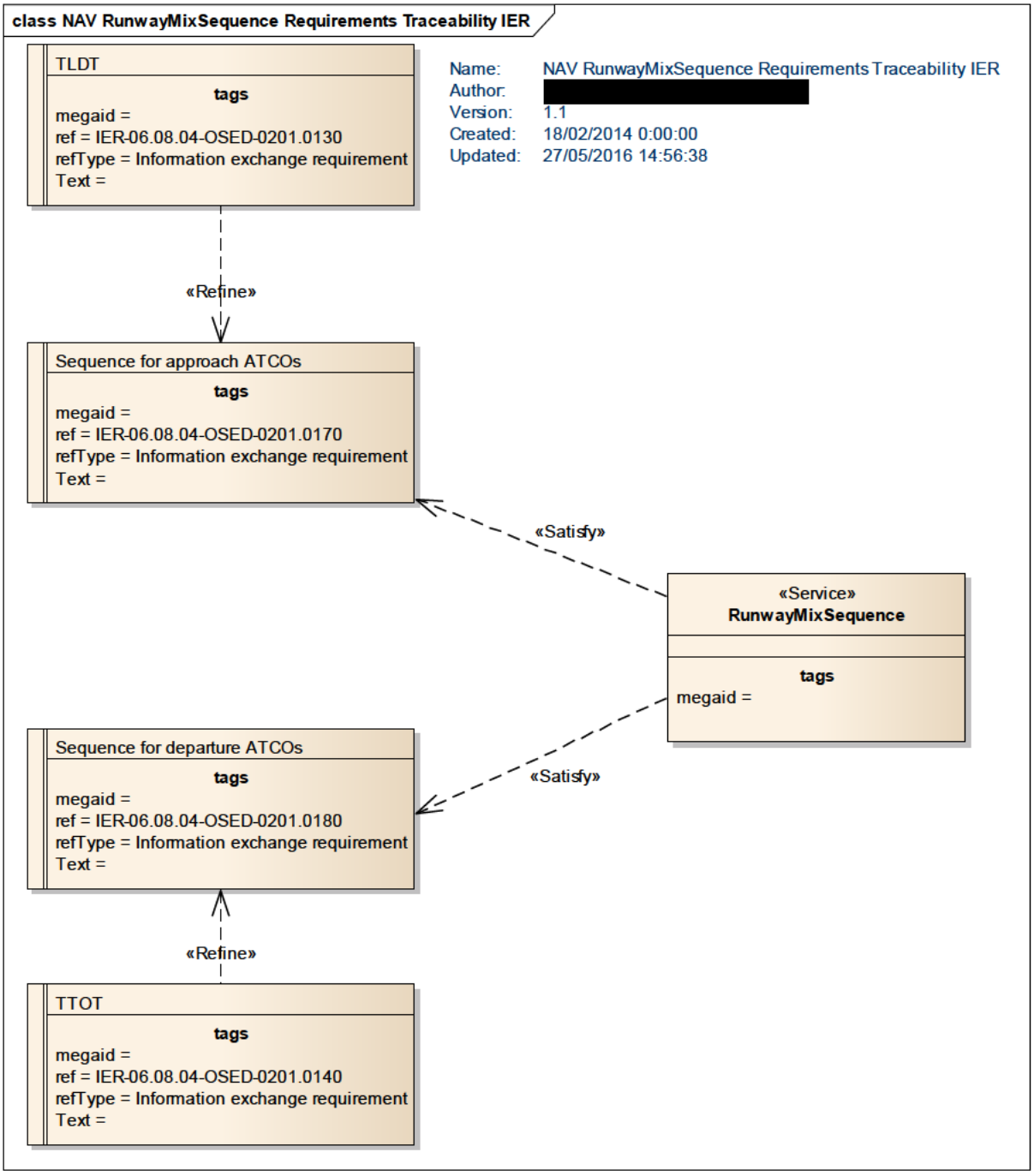

Figure 1 NAV RunwayMixSequence Requirements Traceability IER diagram

3.2 Other Requirements

3.2.1 Non-Functional Requirements

The following diagram depicts the Non-Functional Requirements (NFR) for the service:

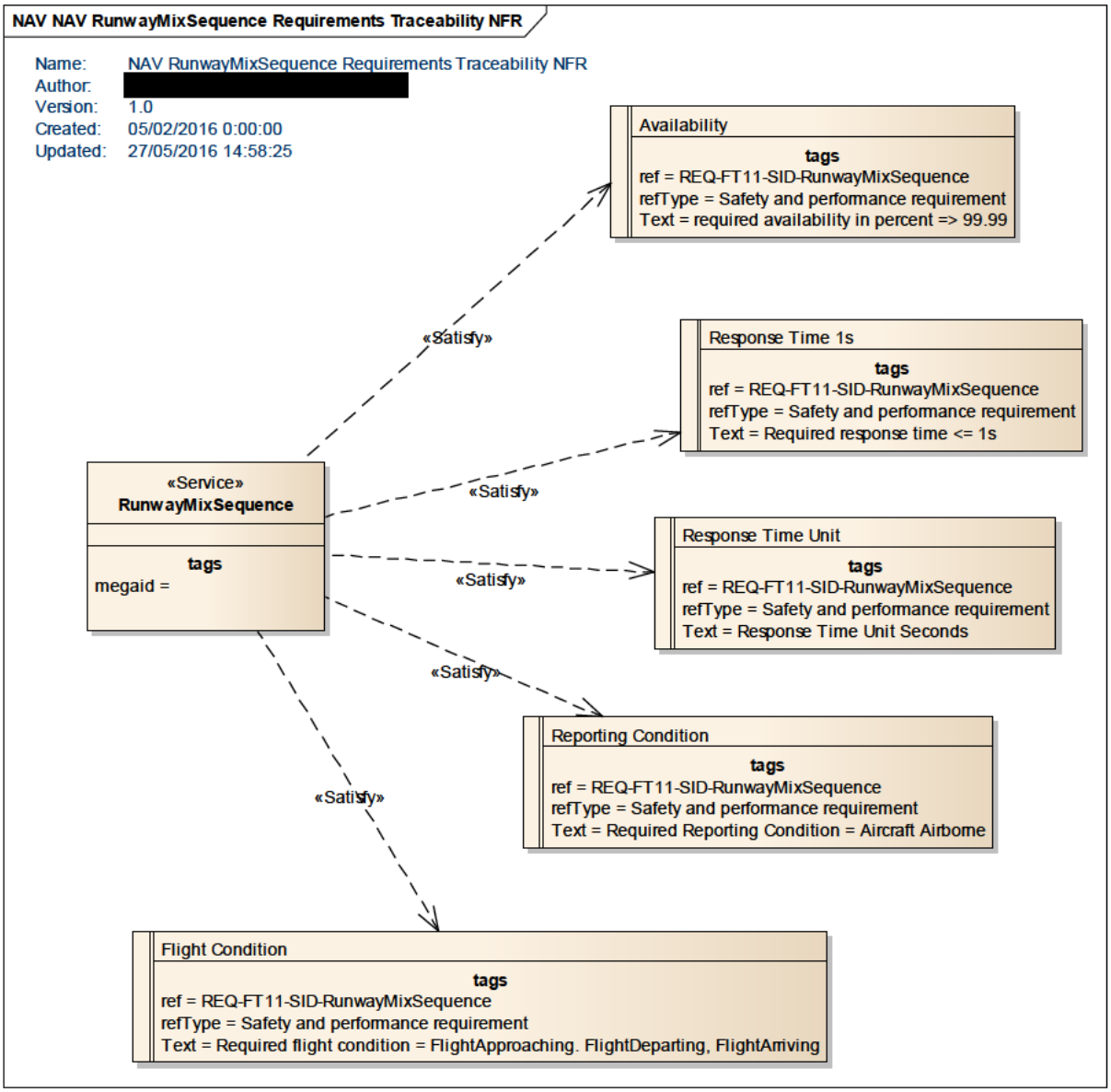

Figure 2: NAV RunwayMixSequence Requirements Traceability NfR diagram

3.2.2 Relevant Industrial Standards

These are the standards that can be considered relevant for this service:

- ED-133 because will be able to support exchanges not only between ATC, but also between Airports, Towers and AMAN/DMAN.
- FIXM because will be able to support all kind of Flight data exchanges globally including the Airport, Tower and AMAN/DMAN information.

3.2.3 Nodes

The following diagram represents the Nodes which will be providing and consuming the service:

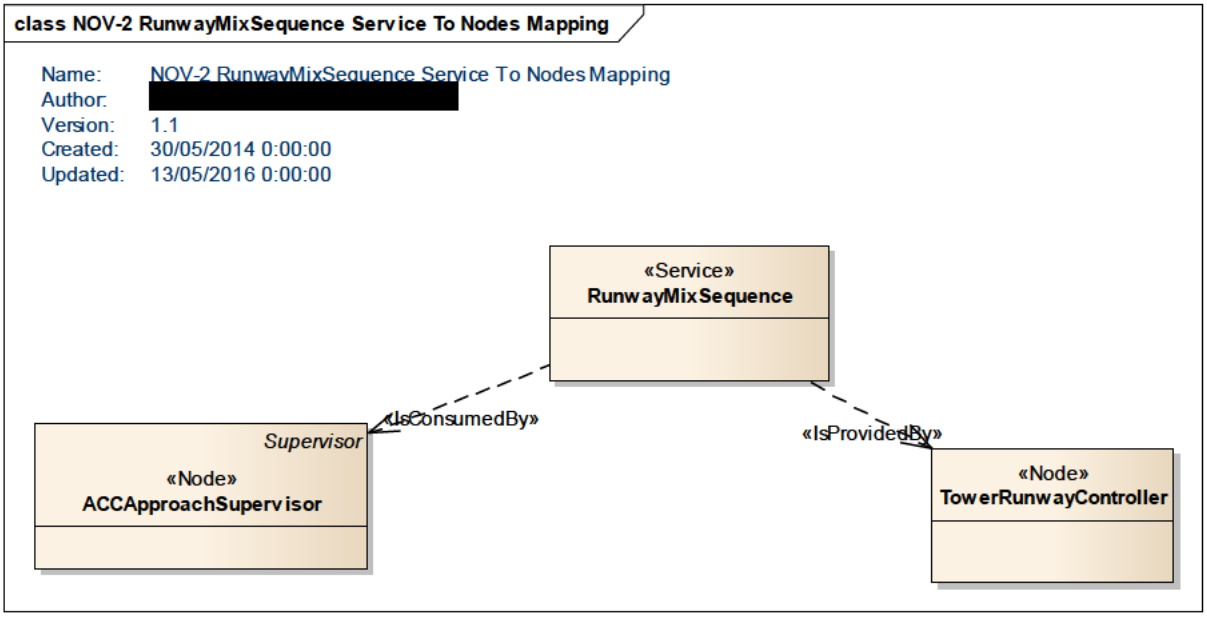

Figure 3: NOV-2 RunwayMixSequence Service to Nodes Mapping diagram

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 mapping from Service to Capabilities are shown in the following diagram:

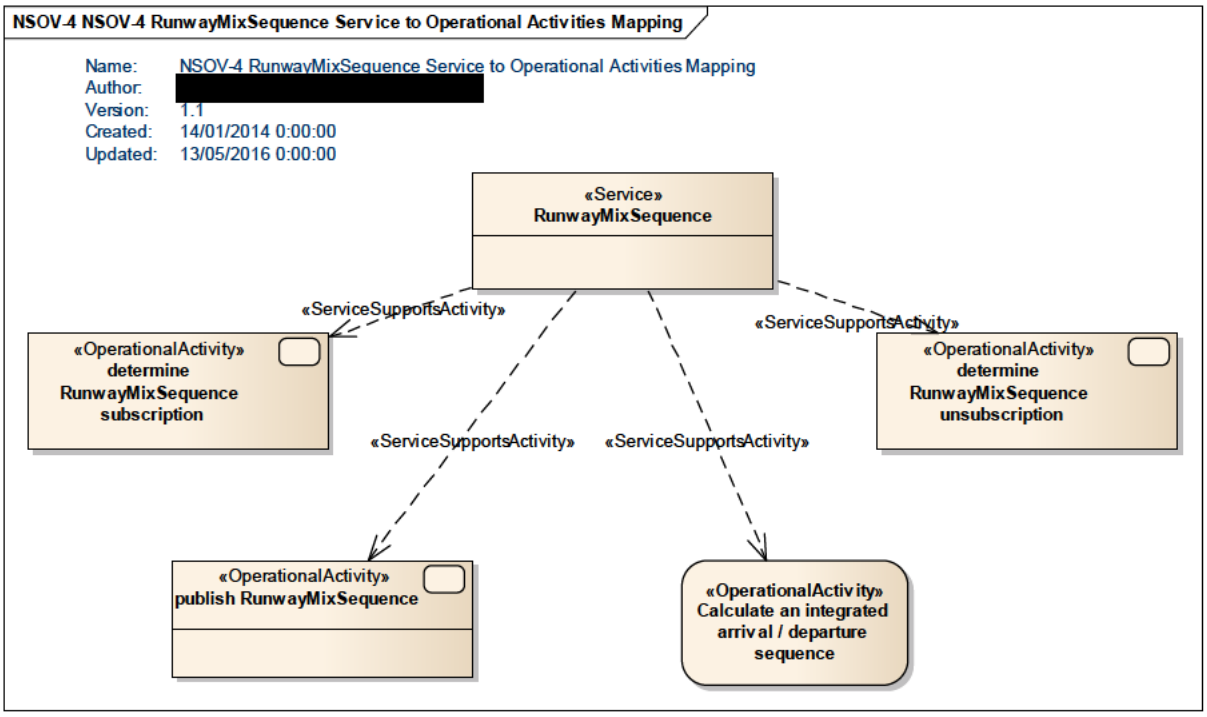

Figure 4: NSOV-4 RunwayMixSequence Service to Operational Activities Mapping diagram

For the service to capabilities mapping, see the NSOV-2 Service Interface Definition diagram in Section 5.1.1

4.4 Service Interfaces

The ProvidedRunwayMixSequence service interface definition allows the consumer to subscribe or unsubscribe to the data, while the RequiredRunwayMixSequence Subscriber service interface definition allows the service provider to publish the message containing the data. The messages for subscription and un-subscription are only logical abstract wrappers, since the actual management of the publication mechanism is done at the level of the SWIM Technical Infrastructure.

The following diagram describes the interfaces of the service including the selected Message Exchange Pattern Publish/Subscribe Push.

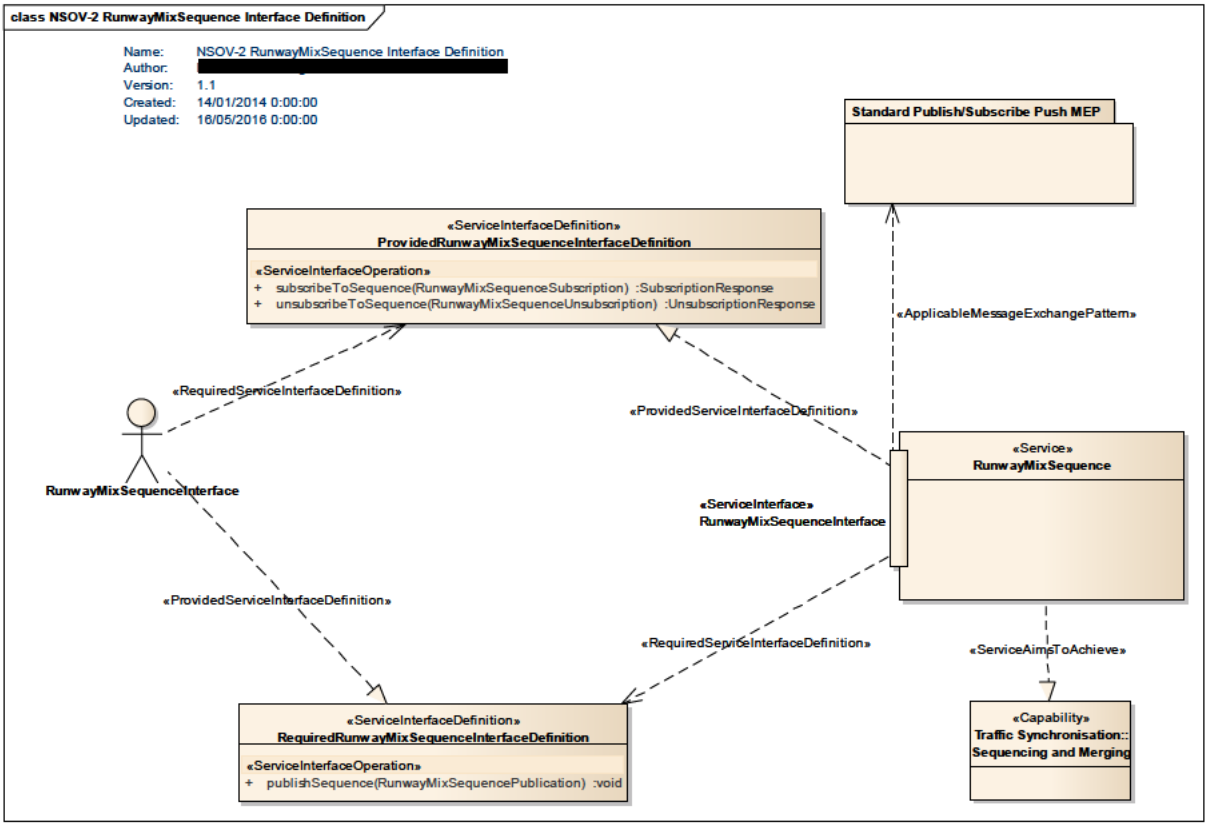

Figure 5: NSOV-2 RunwayMixSequence Interface Definition diagram

ServiceInterface	ServiceInterfaceDefinition	ServiceInterfaceOperation	Role
RunwayMixSequenceInterface	ProvidedRunwayMixSequenceInterfaceDefinition	subscribeToSequence	provided
RunwayMixSequenceInterface	ProvidedRunwayMixSequenceInterfaceDefinition	unsubscribeToSequence	provided
RunwayMixSequenceInterface	RequiredRunwayMixSequenceInterfaceDefinition	publishSequence	required

Table 3: Service Interfaces

5 Service interface specifications

5.1 Service Interface NOPInterface

This is the only interface for this service. It implements the Standard Publish/Subscribe Push message exchange pattern, and exposes two service interface definitions, one for the provider and one for the consumer side.

5.1.1 Service Interface Definition RequiredRunwayMixSequenceInterfaceDefinition

5.1.1.1 Operation subscribeToSequence

The service operation allows the service consumer to subscribe to the Runway Mix information for a particular airport.

5.1.1.1.1 Operation Functionality

The service operation allows the consumer to select the desired airport for receiving the Runway Mix information.

5.1.1.1.2 Operation Parameters

The operation has been modelled with a return type representing the generic outcome for a subscription

Element Name	Author	Notes
RunwayMixSequenceSubscription	[redacted]	This message type contains the information for the subscription to a RunwayMixSequence

Table 4. Payload Elements for the subscribeToSequence

5.1.1.2 Operation unsubscribeToSequence

The service operation allows the service consumer to unsubscribe from the service.

5.1.1.3 Operation Functionality

The service operation allows the service consumer to unsubscribe to the Runway Mix information for a particular airport.

5.1.1.4 Operation Parameters

The operation has been modelled with a return type representing the generic outcome for a unsubscription

Element Name	Author	Notes
RunwayMixSequenceUnsubscription	[redacted]	This message type contains the information for the unsubscription to a RunwayMixSequence

Table 5. Payload Elements for the unsubscribeToSequence

5.1.2 Service Interface Definition ProvidedRunwayMixSequenceInterfaceDefinition

5.1.2.1 Operation publishSequence

The service operation allows the service provider to publish the runway mix information for a particular airport.

5.1.2.1.1 Operation Functionality

The service operation allows the provider to publish the runway mix information.

5.1.2.1.2 Operation Parameters

The operation has been modelled with a return type representing the generic outcome for a subscription

Element Name	Author	Notes
RunwayMixSequencePublication	[redacted]	This message type contains the information for the publication of the information related with the RunwayMixSequence

Table 6. Payload Elements for the publishSequence

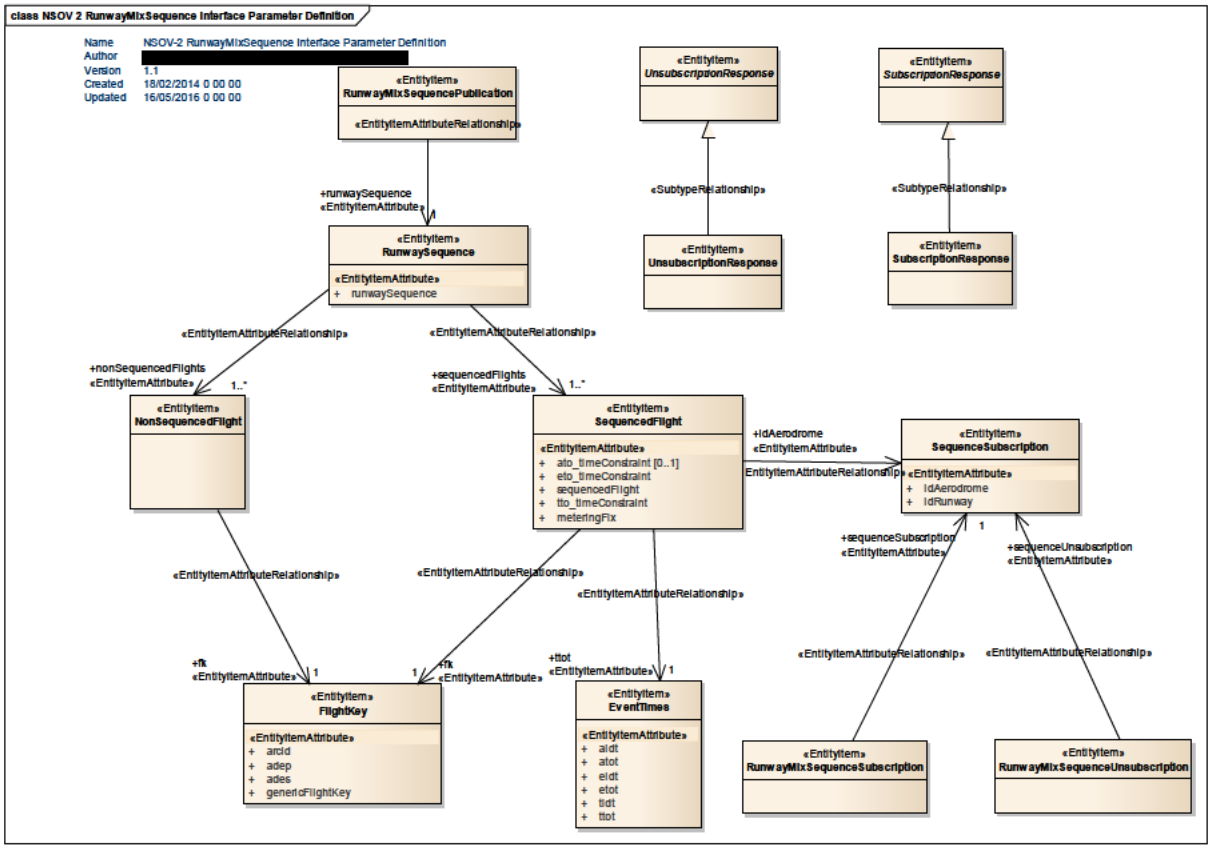

Figure 6: NSOV-2 RunwayMixSequence Interface publish/subscribe/unsubscribe Parameter Definition diagram

Element Name	Author	Notes
SubscriptionResponse	[redacted]	Reply to the subscription operation.

Element Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
UnsubscriptionResponse	[redacted]	Reply to the unsubscription operation.

Element Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
RunwayMixSequencePublication	[redacted]	This message type contains the information for the publication of the information related with the RunwayMixSequence

Element Tagged Value Name	Value
encoding	

Element Name	Author	Notes
RunwayMixSequenceSubscription	[redacted]	This message type contains the information for the subscription to a RunwayMixSequence

Element Tagged Value Name	Value
encoding	

Element Name	Author	Notes
RunwayMixSequenceUnsubscription	[redacted]	This message type contains the information for the unsubscription to a RunwayMixSequence

Element Tagged Value Name	Value
encoding	

Element Name	Author	Notes
EventTimes	[redacted]	Time information for each flight in the runway sequence

Attribute Name	Type	Notes
aldt		Actual Landing Time

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:Landing@time
IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:ActualLandingTime

Attribute Name	Type	Notes
atot		Actual Take-Off Time

Tagged Value Name	Value
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:TakeOff@time
IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:ActualTakeOffTime

	Attribute Name	Type	Notes
	eldt		Estimated Landing Time
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ESTIMATED	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:Landing@time	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:EstimatedLandingTime	
	Attribute Name	**Type**	**Notes**
	etot		Estimated Take-Off Time
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ESTIMATED	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:TakeOff@time	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:EstimatedTakeOffTime	
	Attribute Name	**Type**	**Notes**
	tldt		Target Landing Time
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@TARGET	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:Landing@time	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:TargetLandingTime	
	Attribute Name	**Type**	**Notes**
	ttot		Target Take-Off Time
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@TARGET	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:TakeOff@time	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:TargetTakeOffTime	
Element Name	**Author**	**Notes**	
FlightKey	[redacted]	Indetifier information for each flight in of the runway sequence	
	Attribute Name	**Type**	**Notes**
	arcid		Callsign
	Tagged Value Name	**Value**	

	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightIdentifier:AircraftIdentification
	Attribute Name	**Type**	**Notes**
	adep		Departure Aerodrome
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@departureAerodrome	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO	
	Attribute Name	**Type**	**Notes**
	ades		Destination Aerodrome
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@destinationAerodrome	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@locationIndicatorICAO	
	Attribute Name	**Type**	**Notes**
	genericFlightKey		A unique identifier of the flight. The specifics are implementation dependent (could, e.g., be a Flight Object identifier or a GUFI).
	Tagged Value Name	**Value**	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@identifier	
Element Name		**Author**	**Notes**
NonSequencedFlight		[redacted]	Data for each element of the runway sequence which is not sequenced.
Element Name		**Author**	**Notes**
SequenceSubscription		[redacted]	Reference information for further flights using the runway that are not handled via the sequencer.
	Attribute Name	**Type**	**Notes**
	idAerodrome		An identifier of the aerodrome. Usually the ICAO location indicator
	Tagged Value Name	**Value**	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:Aerodrome@identifier	
	Attribute Name	**Type**	**Notes**
	idRunway		An identifier of the runway direction.
	Tagged Value Name	**Value**	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:BaseInfrastructure:AerodromeInfrastructure:RunwayDirection@identifier	
Element Name		**Author**	**Notes**
RunwaySequence		[redacted]	Data for each element of the runway sequence
	Attribute Name	**Type**	**Notes**
	runwaySequence		The complex data type describing the runway

			sequence itself. Implementation dependent.
	Tagged Value Name	**Value**	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:RunwayMixSequence	
Element Name	**Author**	**Notes**	
SequencedFlight	[redacted]	A flight in the sequence	
	Attribute Name	**Type**	**Notes**
	ato_timeConstraint		Trajectory time constraint resulting from actual
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ACTUAL	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverPoint@time	
	Attribute Name	**Type**	**Notes**
	eto_timeConstraint		Trajectory time constraint resulting from estimate
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@ESTIMATED	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverPoint@time	
	Attribute Name	**Type**	**Notes**
	sequencedFlight		Complex data structure containing specific information on individual flights related to its sequencing. Inter alia, this includes the sequence number.
	Tagged Value Name	**Value**	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:RunwaySequencing	
	Attribute Name	**Type**	**Notes**
	tto_timeConstraint		Trajectory time constraint resulting from setting target
	Tagged Value Name	**Value**	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@TARGET	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Common:Codelists:CodePlanningStatusType@TARGET	

	CLDMSemanticTrace		urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverPoint@time
	Attribute Name	**Type**	**Notes**
	meteringFix		The point for which the constraints are computed
	Tagged Value Name	**Value**	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@meteringFix	
Element Name	**Author**	**Notes**	
RunwayMixSequence	[redacted]	The runway mix sequence service is in charge of published the runway mix sequence generated by the tower to the previously subscribed nodes (usually the ATC APP) in order to have a unique sequence shared for arrivals and departures. There is also an operation for unsubscribing, with the same payload as the subscribe operation.	
	Element Tagged Value Name	**Value**	
	megaid		
Element Name	**Author**	**Notes**	
RunwayMixSequenceInterface	[redacted]	Consumer of the RunwayMixSequence service.	
Element Name	**Author**	**Notes**	
ProvidedRunwayMixSequenceInterfaceDefinition	[redacted]	ProvidedRunwayMixSequenceInterfaceDefinition	
	Element Tagged Value Name	**Value**	
	megaid		
Element Name	**Author**	**Notes**	
RequiredRunwayMixSequenceInterfaceDefinition	[redacted]	RequiredRunwayMixSequenceInterfaceDefinition	
	Element Tagged Value Name	**Value**	
	megaid		
Element Name	**Author**	**Notes**	
runwayMixSequenceService	[redacted]	runwayMixSequenceService	
	Element Tagged Value Name	**Value**	
	forEnvironment		
	megaid		

Table 7: Payload tracing to AIRM

6 Service dynamic behaviour

The interface offers three operations, namely to subscribe/unsubscribe from the publication of the data, and to notify the consumer on the data being available. The service dynamic behaviour can be shown using the NSOV-5c Service-Event diagram created for the purpose. The following diagram shows that the interaction envisaged between provider and consumer is an asynchronous publish/subscribe "push" type MEP.

6.1 Service Interface RunwayMixSequence

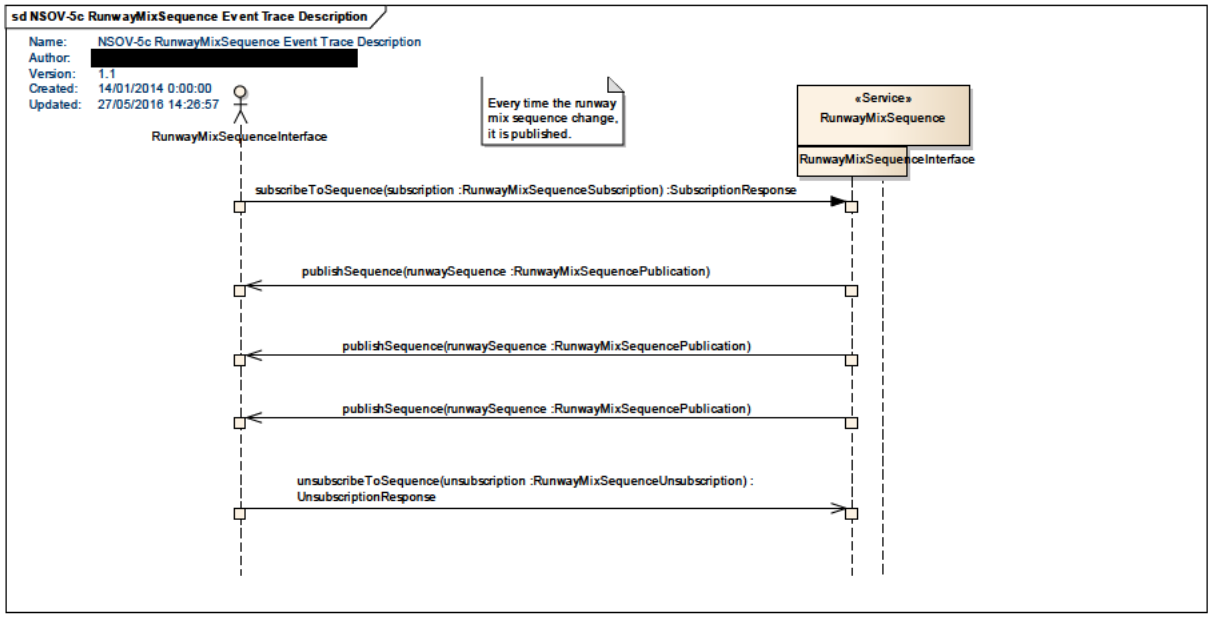

Figure 7: NSOV-5c RunwayMixSequence Event Trace Description

7 Service provisioning (optional)

N/A.

8 Validation and Verification

8.1 Verification

Verification was performed according to the ISRM Rulebook [6] and the ISRM Verification Guidance [7].

8.1.1 Verification Results

Verification was performed via manual inspection and assisted by a script developed in 8.3.10. The verification outcome is completely free of errors.

Verification reports are in these files “Designed_Services_-_RunwayMixSequenceService” available in [13].

8.2 Validation

As this service was designed at the beginning of the 6.8.4 timeline, it was used and demonstrated in a 6.8.4 Demo [12], and the results served as inputs for the following validations:

- EXE-06.08.04-VP-343
- EXE-05.03-VP-804.

Unfortunately, none of these validations made use of the RunwayMixSequence service.

9 References

Nr.	Version	Reference
[1] Project deliverables template	03.00.00	SJU templates & guidelines package, Project deliverables template.dot
[2] OSED template	03.00.00	SJU templates & guidelines package, SESAR Operational Service and Environment Definition.dot
[3] SPR template	03.00.00	SJU templates & guidelines package, SESAR Safety and Performance Requirements.dot
[4] ISRM Tooling Guidelines	00.07.00	08.03.10 D44
[5] ISRM Modelling Guidelines	00.07.00	08.03.10 D44
[6] ISRM Rule Book	00.07.00	08.03.10 D44
[7] ISRM Verification Guidelines	00.07.00	08.03.10 D44
[8] EATMA Guidance Material	00.04.02	B.04.01 D66
[9] ISRM service portfolio	00.08.01	08.03.10 D65
[10] Information Exchange Requirements	00.01.00	06.08.04 Internal doc, FT11-IERs.docx
[11] OSED AMAN-DMAN Step2-V1	00.01.00	06.08.04 D21
[12] Phase 2 - Prototype	00.01.00	12.03.05.D11
[13] Verification reports for the service	00.00.01	08.03.10 D65 Designed_Services_-_RunwayMixSequenceService.xls
[14] Service Identification Report	00.01.00	08.03.06 Internal doc, SESAR European ATM Service Identification for Coupled_AMAN-DMAN (FT-11)v1.0.doc

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