European ATM Service Description for the ATCFlightObjectControl 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 ATCFlightObjectControl Service
Deliverable ID	D65
Edition	00.02.01
Template Version	02.00.02
Task contributors	
DFS, EUROCONTROL, NORACON, NATMIG, FINMECCANICA, FREQUENTIS, THALES, ENAIRE, DSNA, INDRA, SEAC and ENAV	

Abstract

This document describes the ATCFlightObjectControl service that allows consumers to request a number of changes to a Flight Object which is being managed by the service provider. It is closly related to the "ShareFlightObject" service, which is used to distribute the Flight Object Clusters to the concerned IOP stakeholders.
The purpose of this Service description is to provide a holistic overview of a particular service and its building blocks. It serves as a complement to a model based description and supports the configuration management process by providing well-defined baselines. The service implements functionality as defined in the EUROCAE ED-133 standard [17]

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[redacted] LFV		No comment provided, considered as accepted, 18/05/2015
[redacted] INDRA		No comment provided, considered as accepted, 18/05/2015
[redacted] NLR		No comment provided, considered as accepted, 18/05/2015
[redacted] Eurocontrol		No comment provided, considered as accepted, 18/05/2015
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	[redacted]	considered as accepted, 18/05/2015
[redacted] INDRA		No comment provided, considered as accepted, 18/05/2015
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Document History

Edition	Date	Status	Author	Justification
00.01.00	30/3/2012	Final	[redacted]	Approved
00.01.01	06/12/2013	Final		Template update
00.01.02	29/04/2014	Final		Changes due to ISRM migration.
00.01.03	24/10/2014	Final		Changes due to ISRM 1.2.
00.01.04	10/05/2015	Final		Changes due to ISRM 1.3
00.01.04	30/11/2015	Final		Changed delivery ID
00.01.04	30/11/2015	Final		Changed delivery ID
00.02.00	31/05/2016	Final		Changes due to ISRM 2.0
00.02.01	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.

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Executive summary

This document describes the ATCFlightObjectControl service that allows consumers to request a number of changes to a Flight Object which is being managed by the service provider, covering the sync operations provided by 10.2.5.

The purpose of this Service description is to provide a holistic overview of a particular service and its building blocks. It services as a complement to a model based description and supports the configuration management process by providing well-defined baselines.

The service implements functionality as defined in the EUROCAE ED-133 standard [17].

A second version of the service as been produced focusing on the i4D and EPP reguirements.

Following the requirements of those validation exercises SVA011 was specifically concentrating on i4D aspects and the “What-If-Flight-Object”. The service activity also took recent work of the EUROCAE WG 59 into account, which firstly introduced a/c generated information for ED133. This new areas are not yet official parts of the ED133 standard but are foreseen to be included into ED 133 rev. a.

1 Introduction

1.1 Purpose of the document

The ATCFlightObjectControl service allows consumers to request a number of changes to a Flight Object which is being managed by the service provider.

The service implements functionality as defined in the EUROCAE ED-133 standard [17].

The purpose of this Service Description Document (SDD) is to provide a description of the services designed within SESAR.

The purpose of the SDD is to provide a complete design description of each service, to describe the services to such a level that it is possible to make decisions on the implementation of the services in activities such as Service Implementation and evolution planning. The document serves as a complement to a model based description and supports the configuration management process by providing well-defined baselines.

The service interfaces enables transmission of Flight Object data between the provider and consumer of the service.

It should be noted that the service itself does not provide means to determine what information shall be sent to which Shared Flight Object service interface. It is expected that the technical systems will determine this by other means.

1.2 Intended readership

This service description 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

- P 4.3 IOP OSED [7]
- TMF Technical Note for Step 1 [8]
- P.4.3, i4D+CTA OSED & Requirements [9]
- 04.03-D112 IOP+i4D Validation Plan [10]

1.4 Glossary of terms

N.A.

1.5 Acronyms and Terminology

1.5.1 Acronyms

Term	Definition
ADD	Architecture Description Document
ATM	Air Traffic Management
ATSU	Air Traffic Service Unit

Term	Definition
CC	Capability Configuration
EATMA	European Air Traffic Management Architecture
E-ATMS	European Air Traffic Management System
EPP	Extended Projected Profile
EUROCAE	The European Organisation for Civil Aviation Equipment
FAA	Federal Aviation Administration
FDMP	Flight Data Manager Publisher
FDU	Flight Data User
FO	Flight Object
IER	Information Exchange Requirement
ISRM	Information Service Reference Model
NAF	NATO Architecture Framework
NSOV	NATO Service Oriented View
NOV	NATO Operational View
NSV	NATO System View
OSED	Operational Service and Environment Definition
QoS	Quality of Service
SDD	Service Description Document
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)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
SoaML	Service Oriented Architecture Modelling Language
STAR	Standard Terminal Arrival Route
SWIM	System Wide Information Management

Term	Definition
UML	Unified Modelling Language
V&V	Validation and Verification
WIC	What-If-Contributor
WIFO	What-if-Flight-Object
WIMP	What-If-Manager

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. Note: Capability Configuration is a term used in NAF. The equivalent SoaML stereotype to be used is Participant. Also see note in Node term definition.	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	B43 T5 study

Term	Definition	Source
	Pattern.	
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
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	ATCFlightObjectControl
ID	96C4B7A2-18B4-4477-BDC5-F3D79FDB5171
Version	3.0
Keywords	Flight Object
Architect(s)	[redacted] EUROCONTROL, [redacted] THALES, [redacted] DSNA [redacted] DFS

Lifecycle status	Date	References
Identified	30/3/2012, 31/01/2015	See reference [8]
Allocated	N.A.	Not yet allocated.
Designed	30/3/2012, 21/05/2015	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 ATCFlightObjectControl service allows eligible participants, called Flight Data Contributors (FDC), to request a number of changes to the Flight Object which is being managed by the current Flight Data Manager / Publisher (FDMP) for the flight. Also the WIFO functionality is addressed by the 'FlightObjectControl' service.

A number of operational requirements have been stated in reference [7]. This OSED did not however include specific Information Exchange Requirements (IER) so a set of IERs which are proposed to be included in the OSED at a later stage.

It should be noted, that every IOP-stakeholder can take every role described in the ED133 standard. The service model therefore doesn't explicitly contain those roles and is intended to be as generic as needed, to support all IOP use cases. That also means that every consumer and provider interface described within this document has to be implenmented by every IOP stakeholder.

The operational context for i4D data is described within the use cases provided by the "TMF Technical Note for Step 1 [8]", which includes the "IOP OSED and Requirements [7]" and "i4D+CTA OSED and Requirements [9]"

The following Use Cases of "TMF Technical Note for Step 1 [8]" are explicitely adressed by the service design.

1. Standard Coordination of Flight

   This use case describes the process by which a standard coordination is performed for a flight between two ATSUs using the Flight Object.

   (Including the use cases in conjunction like, Revision of Flight Level, Revision of Coordination Level, Direct Routing across a Boundary, Abrogation of Coordination)

2. Non-Standard Coordination

   This operational scenario covers the negotiation of coordination between the Transferring ATSU and the Accepting ATSU which doesn't comply with the conditions of an existing LoA between the ATSUs concerned.

   (Including the use cases in conjunction like Coordination Initiation, Level Revision, Request on Frequency, Direct Routing Proposed by accepting ATSU)

3. C-ATSU Performs Consistency Check

   This use case describes the process by which the ground checks the consistency of the flight information held in the EPP against that held by the ground.

4. ETA min/max provided through Flight Object

   This use case describes the process by which the destination ATSU requests the C-ATSU to obtain the ETA min/max from the aircraft on its behalf. The destination ATSU retrieves the ETA min/max information from the Flight Object.

5. Allocate CTA across ATSUs

   This use case describes the process by which a downstream ATSU coordinates with C-ATSU in order to allocate an arrival management CTA constraint to an inbound flight.

6. Cancelation of CTA

   This use case describes the process by which a previously issued CTA is cancelled, using the Flight Object, whilst the aircraft is still under control of an upstream ATSU.

Very likely the service design also complies to a lot of other use cases described within the “TMF Technical Note for Step 1 [8]”, as it implements the information exchanges of the ED 133 [17] standard.

The information exchange requirements where derived from the “TMF Technical Note for Step 1 [8]”. This document also indicates, which use cases where considered to fulfil the information requirements of VP030.

The ‘FlightObjectControl’ service is used to carry out changes to the Flight Object. The service does not distribute the changes to the concerned IOP stakeholder. For the distribution of the FO, the ‘ShareFlightObject’ service has to be used.

The following picture gives an example taken from ED133 on how the two services cooperate.

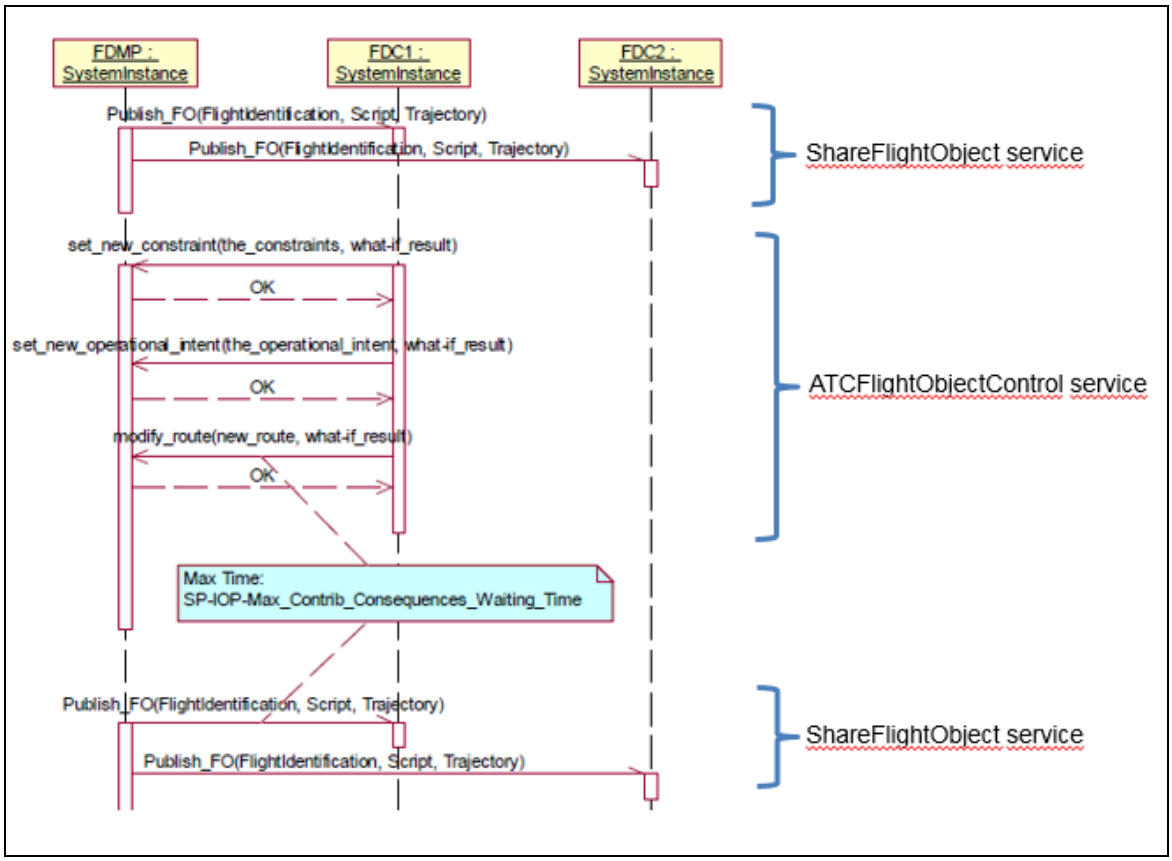

Figure 1: ED133 informationexchange and there mapping to the SWIM FO services

3.1 Information Exchange Requirements

A number of operational requirements have been stated in reference [7]. This OSED did not however include specific Information Exchange Requirements (IER). The Service Activity has derived a set of IERs which are proposed to be included in the OSED at a later stage.

The derived IERs fulfilled by this service are depicted in the diagrams below. The detail of each IER is to be found in the appendix B of P 4.3 IOP OSED, [7].

I4D:

The information exchange requirements derived from the "TMF Technical Note for Step 1 [8]" are gathered and listed in the "Technical Note_2015_Informartion Exchanges OFA 3.1.1 00.01.01 [18]".

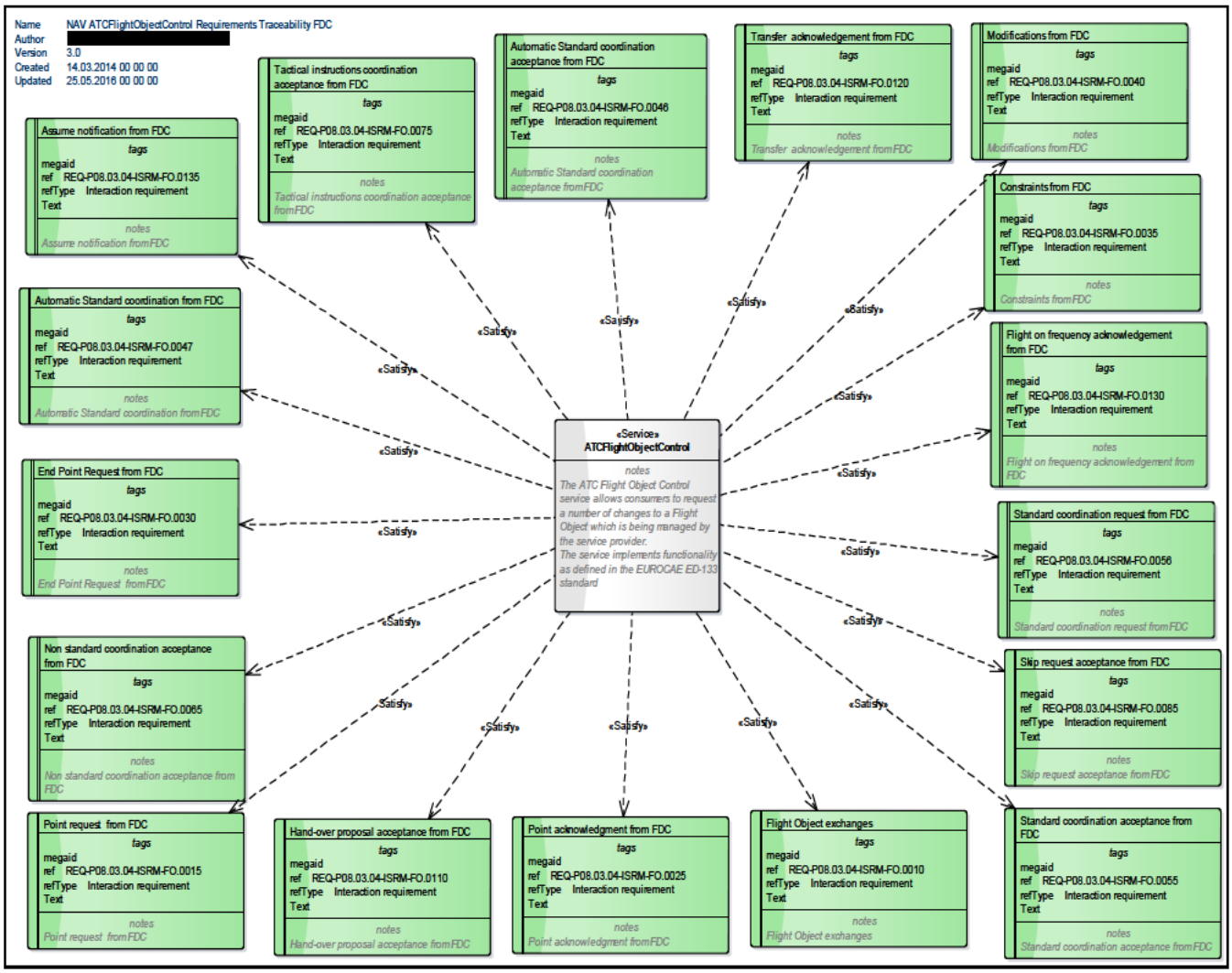

Figure 2: NAV ATCFlightObjectControl Requirements Traceability IER Diagram (FDC)

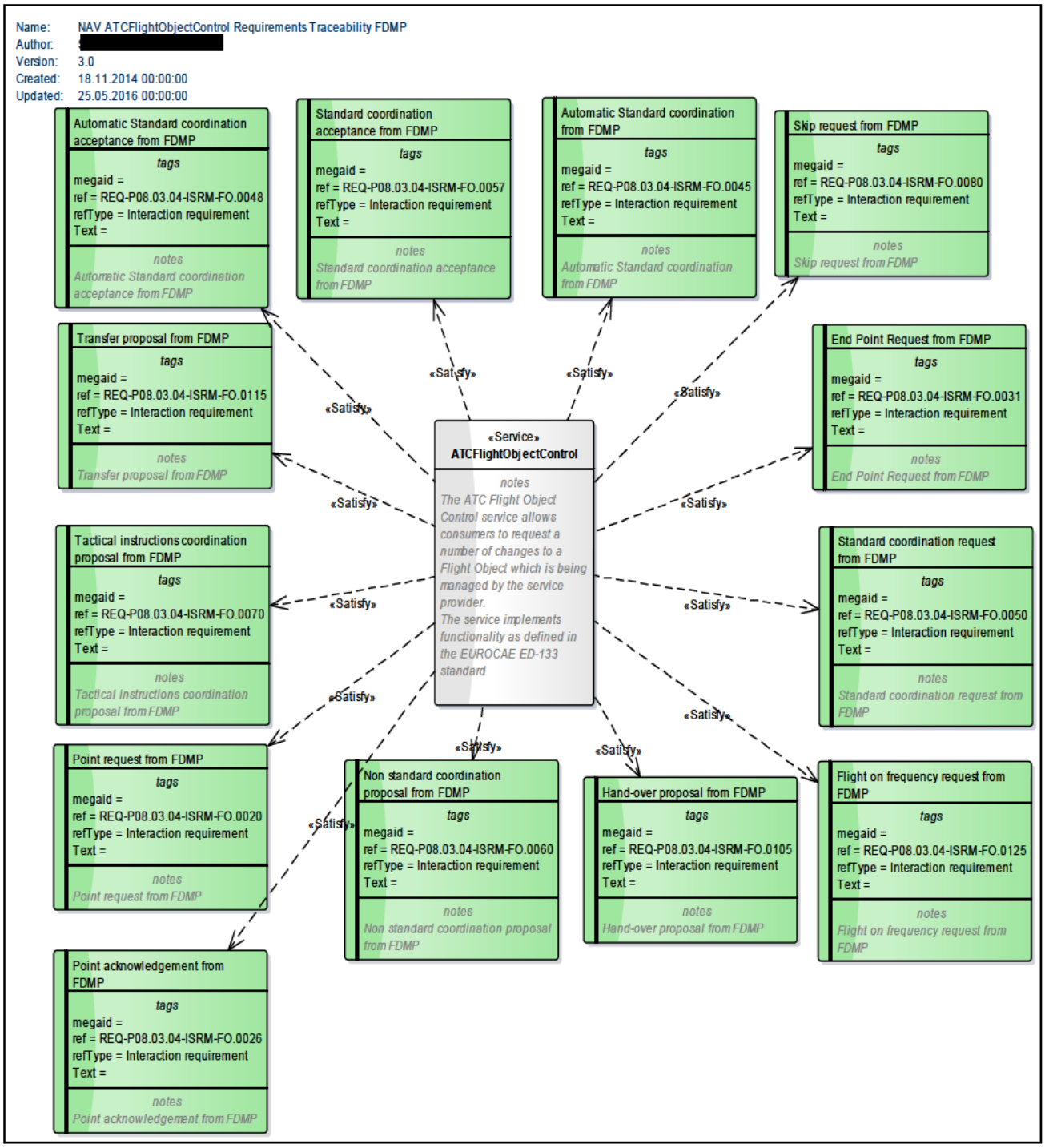

Figure 3: NAV ATCFlightObjectControl Requirements Traceability IER Diagram (FDMP)

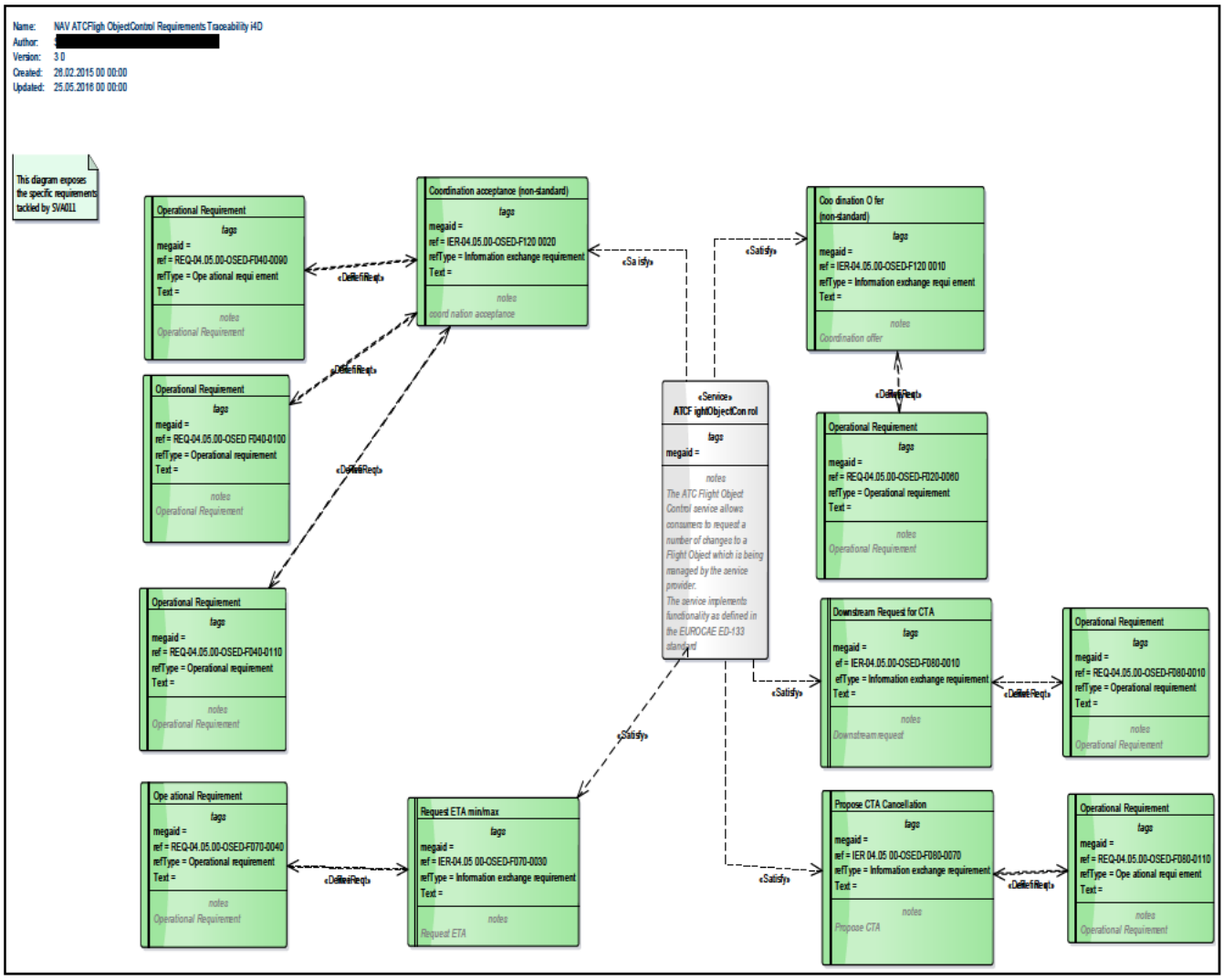

Figure 4: NAV ATCFlightObjectControl Requirements Traceability IER Diagram (i4D and EPP)

Element Name	Author	Notes
Assume notification from FDC	[redacted]	Assume notification from FDC.

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0135
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Automatic Standard coordination acceptance from FDC	[redacted]	Automatic Standard coordination acceptance from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0046
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Automatic Standard coordination acceptance from FDMP	[redacted]	Automatic Standard coordination acceptance from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0048
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Automatic Standard coordination from FDC	[redacted]	Automatic Standard coordination from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0047
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Automatic Standard coordination from FDMP	[redacted]	Automatic Standard coordination from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0045
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Constraints from FDC	[redacted]	Constraints from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0035
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
End Point Request from FDC	[redacted]	End Point Request from FDC

Element Tagged Value Name	Value
megaid	
ref	REQ-P08.03.04-ISRM-FO.0030
refType	Interaction requirement
Text	

Element Name	Author	Notes
End Point Request from FDMP	[redacted]	End Point Request from FDMP

Element Tagged Value Name	Value
megaid	
ref	REQ-P08.03.04-ISRM-FO.0031
refType	Interaction requirement
Text	

Element Name	Author	Notes
End Point request from FDC	[redacted]	End Point request from FDC

Element Tagged Value Name	Value
megaid	
ref	REQ-P08.03.04-ISRM-FO.0030
refType	Interaction requirement
Text	

Element Name	Author	Notes
Flight Object exchanges	[redacted]	Flight Object exchanges

Element Tagged Value Name	Value
megaid	
ref	REQ-P08.03.04-ISRM-FO.0010
refType	Interaction requirement
Text	

Element Name	Author	Notes
Flight on frequency acknowledgement from FDC	[redacted]	Flight on frequency acknowledgement from FDC

Element Tagged Value Name	Value
megaid	
ref	REQ-P08.03.04-ISRM-FO.0130
refType	Interaction requirement
Text	

Element Name	Author	Notes
Flight on frequency request from FDMP	[redacted]	Flight on frequency request from FDMP

Element Tagged Value Name	Value
megaid	
ref	REQ-P08.03.04-ISRM-FO.0125
refType	Interaction requirement
Text	

Element Name	Author	Notes
Hand-over proposal acceptance from FDC	[redacted]	Hand-over proposal acceptance from FDC

Element Tagged Value Name	Value

	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0110
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Hand-over proposal from FDMP	[redacted]	Hand-over proposal from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0105
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Modifications from FDC	[redacted]	Modifications from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0040
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Non-standard coordination acceptance from FDC	[redacted]	Non-standard coordination acceptance from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0065
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Non-standard coordination proposal from FDMP	[redacted]	Non-standard coordination proposal from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0060
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Point acknowledgement from FDMP	[redacted]	Point acknowledgement from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0026
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Point acknowledgement from FDC	[redacted]	Point acknowledgement from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0025
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Point request from FDC	[redacted]	Point request from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0015
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Point request from FDMP	[redacted]	Point request from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0020
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Skip request acceptance from FDC	[redacted]	Skip request acceptance from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0085
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Skip request from FDMP	[redacted]	Skip request from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0080
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Standard coordination acceptance from FDC	[redacted]	Standard coordination acceptance from FDC

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0055
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Standard coordination acceptance from FDMP	[redacted]	Standard coordination acceptance from FDMP

	Element Tagged Value Name	Value
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0057
	refType	Interaction requirement
	Text	

Element Name	Author	Notes
Standard coordination request from FDC	[redacted]	Standard coordination request from FDC

	Element Tagged Value Name	Value

	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0056
	refType	Interaction requirement
	Text	
Element Name	**Author**	**Notes**
Standard coordination request from FDMP	[redacted]	Standard coordination request from FDMP
	Element Tagged Value Name	**Value**
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0050
	refType	Interaction requirement
	Text	
Element Name	**Author**	**Notes**
Tactical instructions coordination acceptance from FDC	[redacted]	Tactical instructions coordination acceptance from FDC
	Element Tagged Value Name	**Value**
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0075
	refType	Interaction requirement
	Text	
Element Name	**Author**	**Notes**
Tactical instructions coordination proposal from FDMP	[redacted]	Tactical instructions coordination proposal from FDMP
	Element Tagged Value Name	**Value**
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0070
	refType	Interaction requirement
	Text	
Element Name	**Author**	**Notes**
Transfer acknowledgement from FDC	[redacted]	Transfer acknowledgement from FDC
	Element Tagged Value Name	**Value**
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.0120
	refType	Interaction requirement
	Text	

Element Name	**Author**	**Notes**
Transfer proposal from FDMP	[redacted]	Transfer proposal from FDMP
	Element Tagged Value Name	**Value**
	megaid	
	ref	REQ-P08.03.04-ISRM-FO.00115
	refType	Interaction requirement
	Text	
Element Name	**Author**	**Notes**
Coordination Offer (non-standard)	[redacted]	Coordination offer
	Element Tagged Value Name	**Value**
	megaid	
	ref	IER-04.05.00-OSED-F120-0010
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Coordination acceptance (non-standard)	[redacted]	coordination acceptance

	Element Tagged Value Name	Value
	megaid	
	ref	IER-04.05.00-OSED-F120-0020
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Request ETA min/max	[redacted]	Request ETA

	Element Tagged Value Name	Value
	megaid	
	ref	IER-04.05.00-OSED-F070-0030
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Downstream Request for CTA	[redacted]	Downstream request

	Element Tagged Value Name	Value
	megaid	
	ref	IER-04.05.00-OSED-F080-0010
	refType	Information exchange requirement
	Text	

Element Name	Author	Notes
Propose CTA Cancellation	[redacted]	Propose CTA

	Element Tagged Value Name	Value
	megaid	
	ref	IER-04.05.00-OSED-F080-0070
	refType	Information exchange requirement
	Text	

Table 1: Requirements Traceability

3.2 Other Requirements

3.2.1 Non-Functional Requirements

N.A.

3.2.2 Relevant Industrial Standards

The relevant standard is the EUROCAE ED133 [17].

3.2.3 Nodes

This chapter shows the Service to Nodes Mapping diagram relevant to this service as shown below.

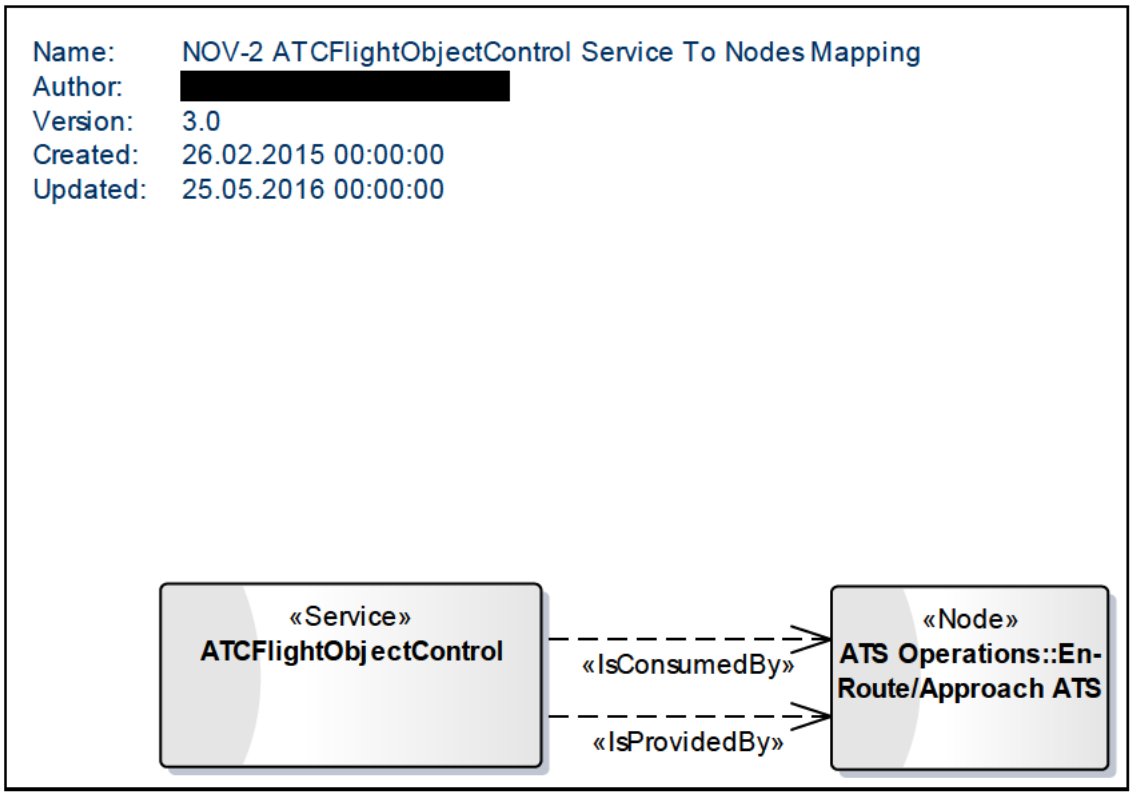

Figure 5: NOV-2 ATCFlightObjectControl Service to Nodes Mapping diagram

4 Service overview

4.1 Service Taxonomy

The service taxonomy is described in the ISRM Service Portfolio document [15].

4.2 Service Levels (NfRs)

Non Functional Requirements are described in section 3.2.1.

4.3 Service Functions and Capabilities

The mapping to Operational Activities is as described in the following figure.

The capability mapping is shown in combination with the interface definition in chapter 4.4.

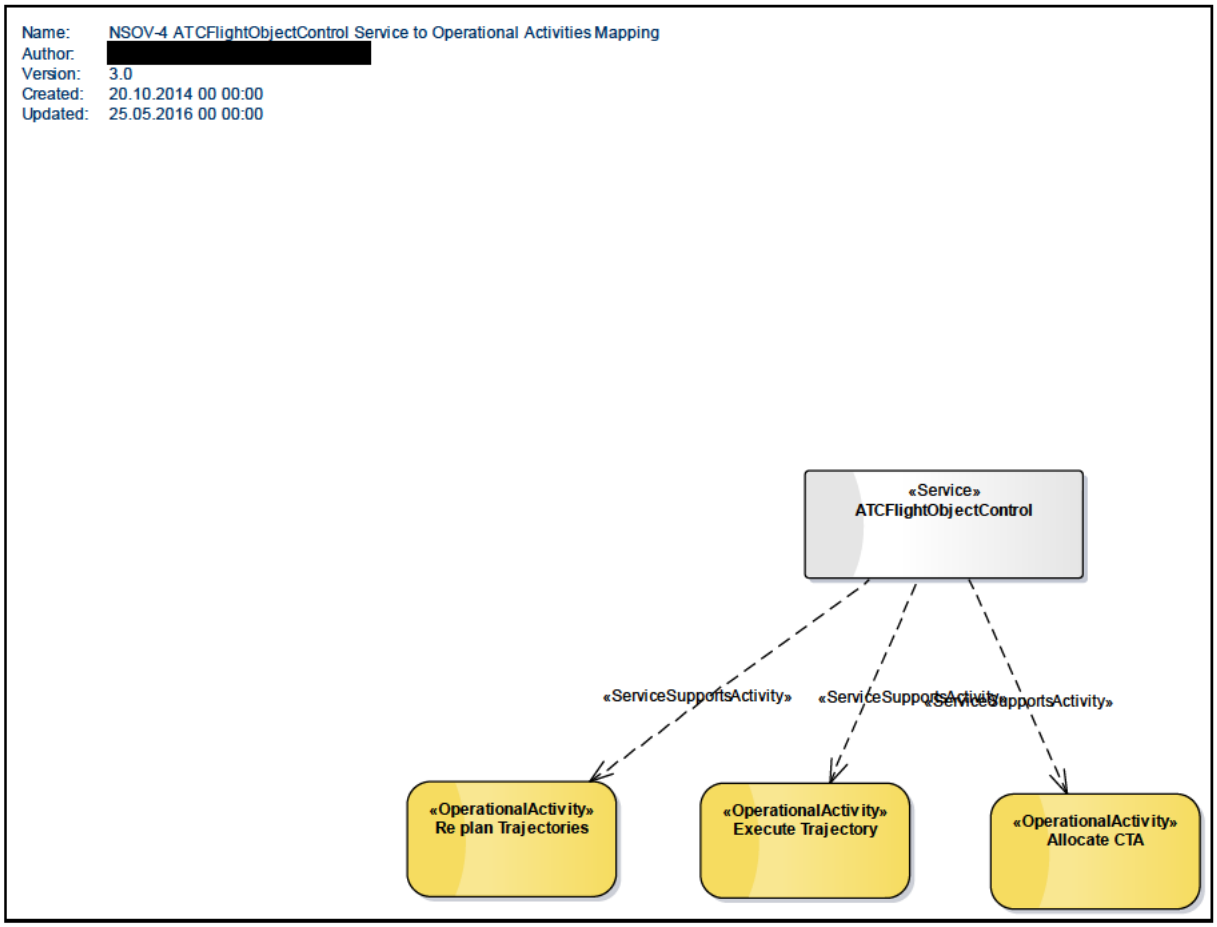

Figure 6: NSOV-4 ATCFlightObjectControl Service to Operational Activities Mapping diagram

4.4 Service Interfaces

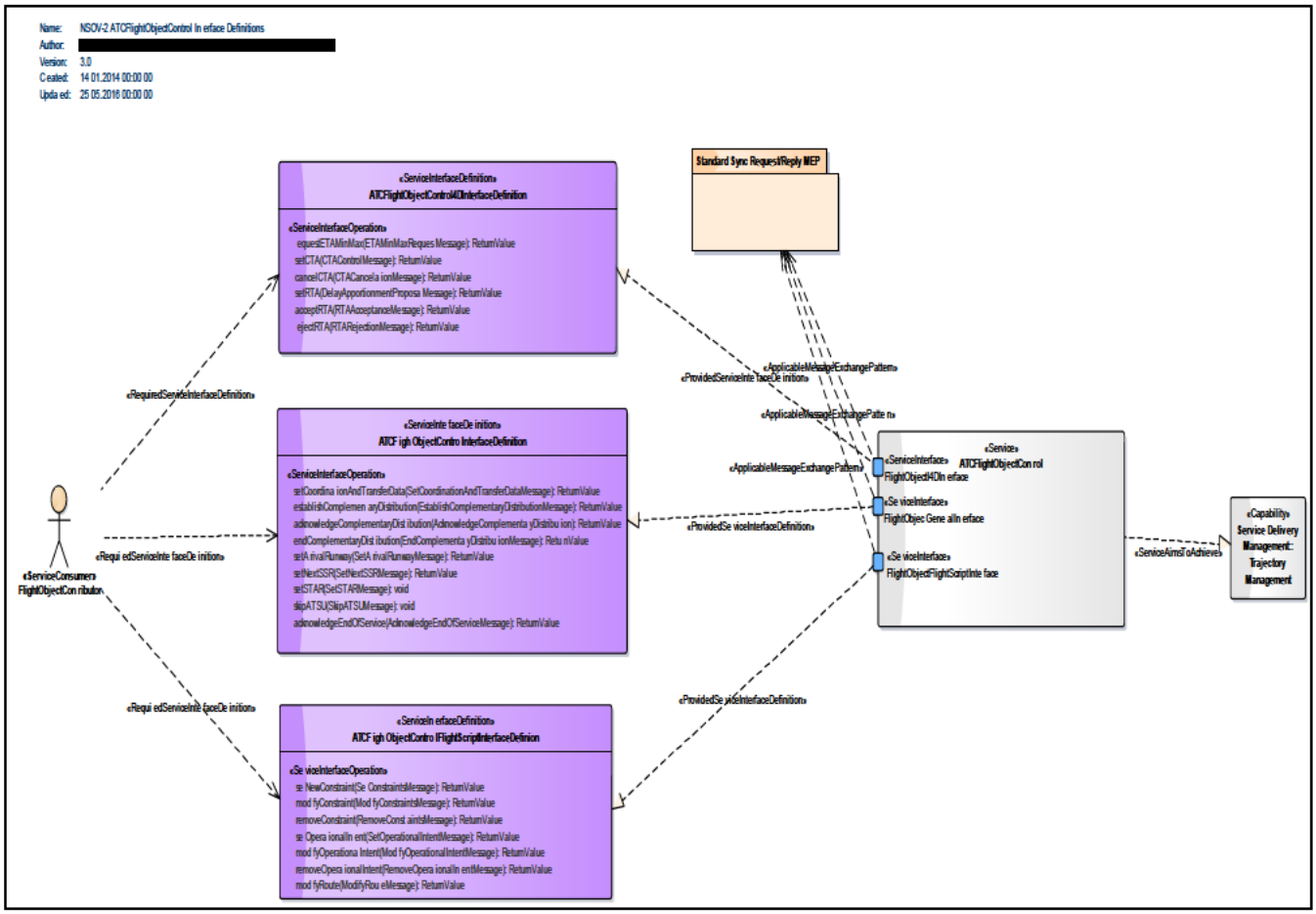

Figure 7: NSOV-2 ATCFlightObjectControl Service Interface Definition diagram

The Service has three service interfaces

1. **FlightObjectI4Dinterface** includes the operations needed for the i4D information exchange.
2. **FlightObjectFlightScriptInterface** includes the operations needed for the exchange of flightscript information.
3. **FlightObjectGeneralInterface** includes additional operations as for coordination and the establishment of a complementary distribution.

The service operation naming is derived from the service naming in the ED133 standard.
The Interfaces are request/reply interfaces.

Service Interface	ServiceInterfaceDefinition	ServiceInterfaceOperation	Role
FlightObjectI4Dinterface	ATCFlightObjectControl4DInterfaceDefinition	requestETAMinMax setCTA cancelCTA setRTA acceptRTA rejectRTA	Provided
FlightObjectFlightScriptInterface	ATCFlightObjectControllFlightScriptInterfaceDefinion	setNewConstraint modifyConstraint removeConstraint setOperationalIntent modifyOperationalIntent removeOperationalIntent modifyRoute	Provided
FlightObjectGeneralInterface	ATCFlightObjectControlInterfaceDefinition	setCoordinationAndTransferData establishComplementaryDistribution acknowledgeComplementaryDistributio n endComplementaryDistribution setArrivalRunway setNextSSR setSTAR skipATSU acknowledgeEndOfService	Provided

Table 2: Service Interfaces

5 Service interface specifications

This chapter describes the details of each interface. The Service Interface specification only covers the static design description while the dynamic design (behaviour) is described in chapter 6.

The static interface description is vital since it describes how the interfaces shall be constructed.

Architectural elements applicable for this description are:

- Service Interfaces
- Service Interface Definitions
- Operations
  Function or procedures which enable programmatic communication with a Service via a Service interface.
- Parameters
  Constants or variables passed into or out of a Service interface as part of the execution of an Operation.

For the service interface description UML-views refer to chapter 4.4.

The service design is modelled analogous to the ED133 vers. 1 service design. The services exposed in ED133 are represented within the ISRM service design by operations.

5.1 Service Interface FlightObjectControl4DInterface

5.1.1 Service Interface Definition ATCFlightObjectControl4DInterfaceDefinition

The ATCFlightObjectControlI4DinterfaceDefinition combines the operations which are needed to exchange i4D data and the EPP provided by the aircraft.

5.1.1.1 Operation requestETAMinMax

This operation is needed to allow for a request of an ETA.

5.1.1.1.1 Operation Functionality

This operation allows a downstream ATSU to request an ETA min/max from the aircraft via the upstream C-ATSU. The status of the ETA request will be set by the C-ATSU who is as the FDMP controlling the flight object. As this is an internal system task at the FDMP site, the status doesn't need to be a part of the message. The destination ATSU will never set the state of the ETA.

5.1.1.1.2 Operation Parameters

The i4D parameters are combined in one diagram shown below. This operation uses the "ETAMinMaxRequest" message.

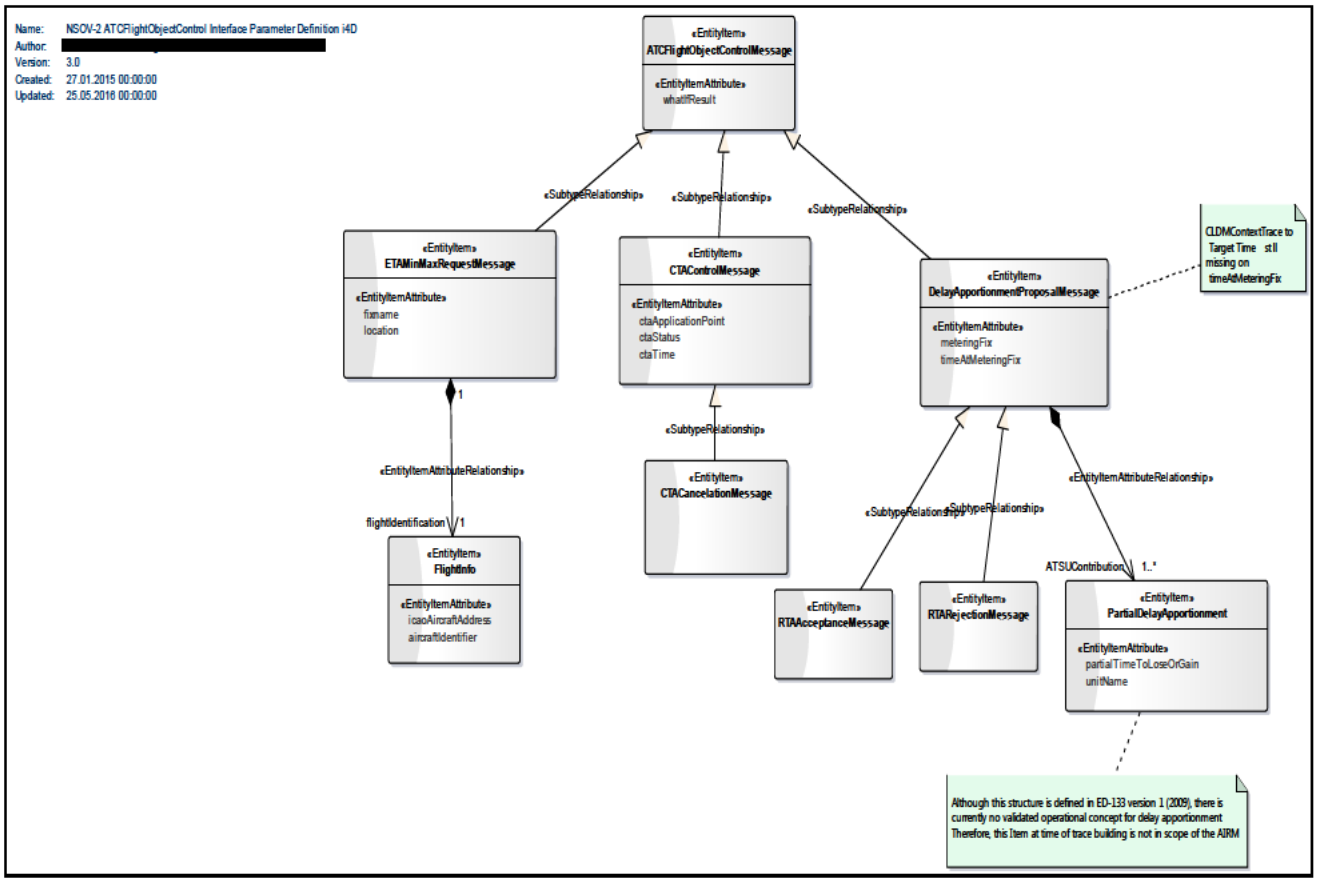

Figure 8: NSOV-2 ATCFlightObjectControl service interface parameter definition i4D

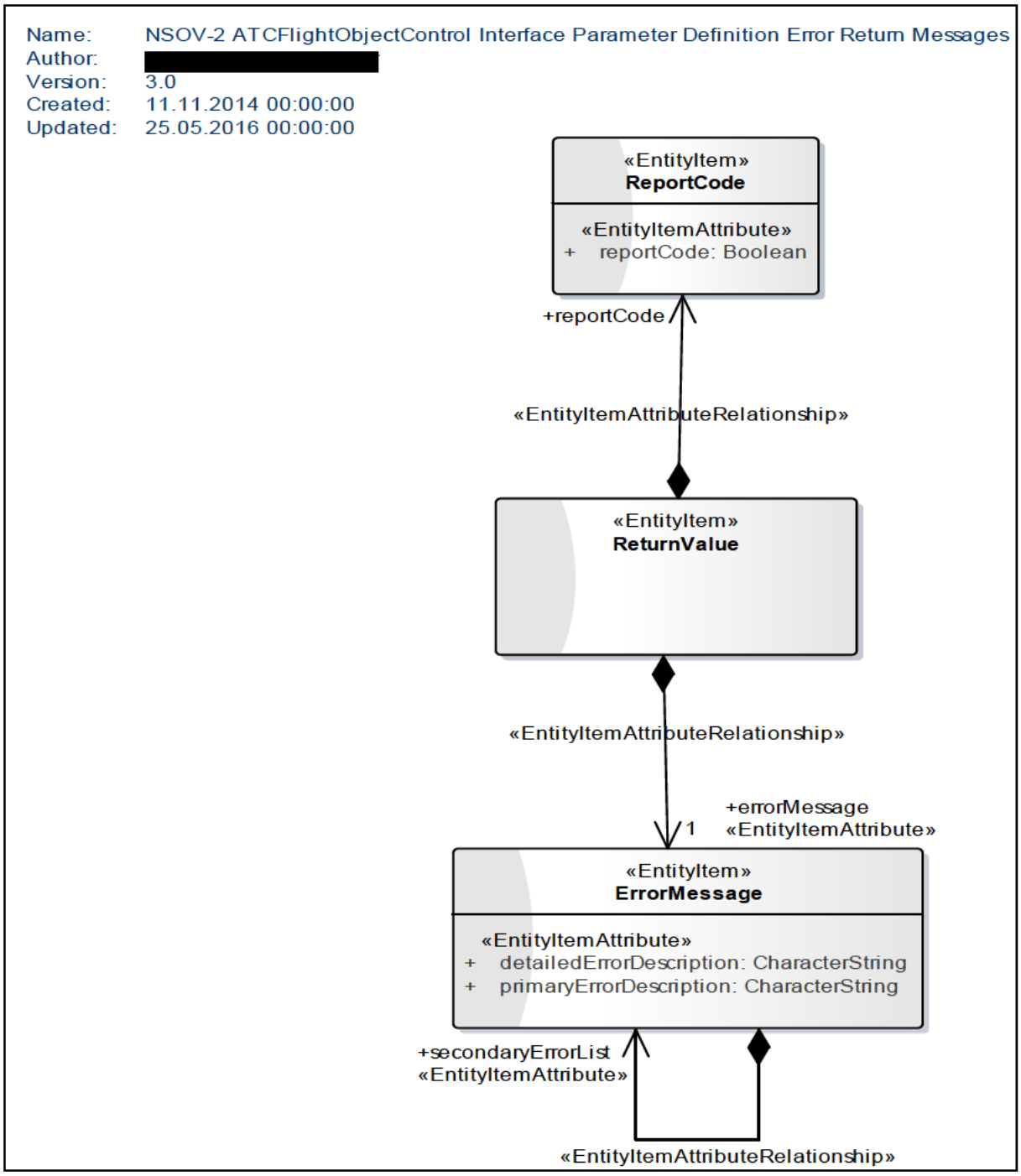

Figure 9: NSOV-2 ATCFlightObjectControl service interface parameter definition error return message

5.1.1.2 Operation setCTA

5.1.1.2.1 Operation Functionality

With this operation the destination ATSU proposes a CTA and sets its status to ‘proposed’.

5.1.1.2.2 Operation Parameters

Input parameter: The “CTAControlMessage” is used by this operation to set a CTA.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.1.1.3 Operation cancelCTA

A previous agreed CTA can be cancelled by any concerned stakeholder (D-ATSU, C-ATSU, flight crew (via C-ATSU)).

5.1.1.3.1 Operation Functionality

The operation is used to set the state of the CTA to ‘cancelled’.

5.1.1.3.2 Operation Parameters

Input Parameter: The Operation uses the “CTACancelationMessage“.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.1.1.4 Operation setRTA

5.1.1.4.1 Operation Functionality

This operation is used to determine the delay apportionment for those ATSUs which AORs will be traversed by the flight. The modelling is following the current ED133 vers. 1 standard. There seems to be a need to align the CTA and RTA concepts. For now it is assumed that the RTA and the delay apportionment will be set after the CTA is agreed and the values concerning the metering point and the date and time will be the same.

5.1.1.4.2 Operation Parameters

Input Parameter: The operation uses the “DelayApportionmentProposalMessage

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.1.1.5 Operation acceptRTA

Inspired by the ED133 (vers. 1) services design an ‘acceptRTA’ operation is modelled.

5.1.1.5.1 Operation Functionality

This operation is used to accept the RTA and the according delay apportionment.

5.1.1.5.2 Operation Parameters

Input Parameter: The operation uses the “RTAAcceptanceMessage “.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.1.1.6 Operation rejectRTA

Inspired by the ED133 (vers. 1) services design a 'rejectRTA' operation is modelled.

5.1.1.6.1 Operation Functionality

The RTA will be rejected by any ATSU whose AOR is traversed by the flight and who is not able to adhere to the proposed delay apportionment.

5.1.1.6.2 Operation Parameters

Input Parameter: The Operation uses the "RTAAcceptanceMessage ".

Output Parameter: The "ReturnValue" message is used for failure reporting.

5.2 Service Interface FlightObjectControlFlightScriptInterface

5.2.1 Service Interface Definition ATCFlightObjectControlFlightScriptInterfaceDefinition

This interface definition contains the operations needed for the flight script modification.

5.2.1.1 Operation setNewConstraint

Operation to incorporate a new constraint into the constraints list.

5.2.1.1.1 Operation Functionality

If a new constraint is stipulated by the controller it will be incorporated into the constraints list.

5.2.1.1.2 Operation Parameters

Input Paremeter: The operation uses the "SetConstraintsMessage".

Output Parameter: The "ReturnValue" message is used for failure reporting.

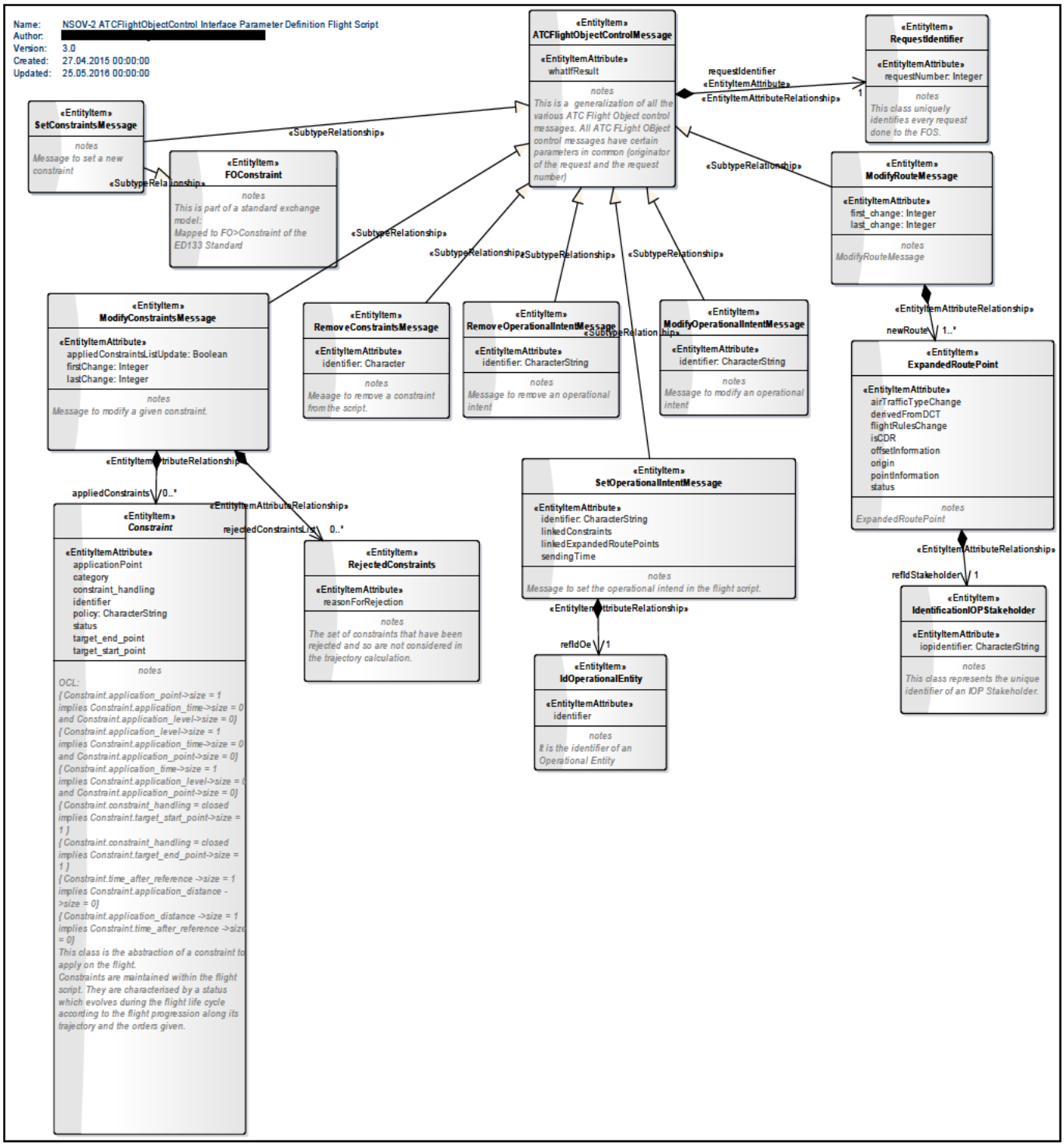

Figure 10: NSOV-2 ATCFlightObjctControl service interface parameter definition flight script

5.2.1.2 Operation modifyConstraint

5.2.1.2.1 Operation Functionality

If a constraint in the list of constraints needs modification, this operation will be used.

This service allows a contributor to modify constraints in the flight script. The list of constraints starts in the last non modified constraint and ends in the first non-modified constraint.

It is a simplification / fixing of the way that the constraint list is updated. Required to modify the updated constraint list structures.

5.2.1.2.2 Operation Parameters

Input Paremeter: The operation uses the “ModifyConstraintsMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.2.1.3 Operation removeConstraint

5.2.1.3.1 Operation Functionality

If a constraint is not longer valid and shall be removed totally from the list, this operation will be used.

5.2.1.3.2 Operation Parameters

Input Parameter: The operation uses the “RemoveConstraintsMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.2.1.4 Operation setOperationalIntent

5.2.1.4.1 Operation Functionality

Operation to initially set an operational intent within the flight script.

5.2.1.4.2 Operation Parameters

Input Parameter: The operation uses the “SetOperationalIntentMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.2.1.5 Operation modifyOperationalIntent

5.2.1.5.1 Operation Functionality

Operation to modify an operational intent in the list.

5.2.1.5.2 Operation Parameters

Input Parameter: The operation uses the “ModifyOperationalIntentMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.2.1.6 Operation removeOperationalIntent

5.2.1.6.1 Operation Functionality

Operation to finaly remove an operational intent from the list.

5.2.1.6.2 Operation Parameters

Input Paramerter: The operation uses the “RemoveOperationalIntentMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.2.1.7 Operation modifyRoute

5.2.1.7.1 Operation Functionality

Operation to modify the 2D Route in the flight script.

This operation allows a contributor to modify the route from a given point. The route will be changed from the first point on the inputted route if it is found downstream the current position on the current route until the last occurrence of the last point of the inputted route (if found) or until the destination airport (if not found).

5.2.1.7.2 Operation Parameters

Input Parameter: The operation uses the “ModifyRouteMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.3 Service Interface FlightObjectGeneralInterface

5.3.1 Service Interface Definition ATCFlightObjectControlInterfaceDefinition

This interface definition describes additional operations stipulated by ED133.

5.3.1.1 Operation setCoordinationAndTransferData

The coordination and transfer of flights when they need to cross the borders between AORs is supported by this operation.

This operation allows a contributor to update coordination related information related to a coordination status. When the coordination requires a change in the expected trajectory, this service will be used together with the ones related to script modifications.

5.3.1.1.1 Operation Functionality

The operation initially sets the coordination data.

5.3.1.1.2 Operation Parameters

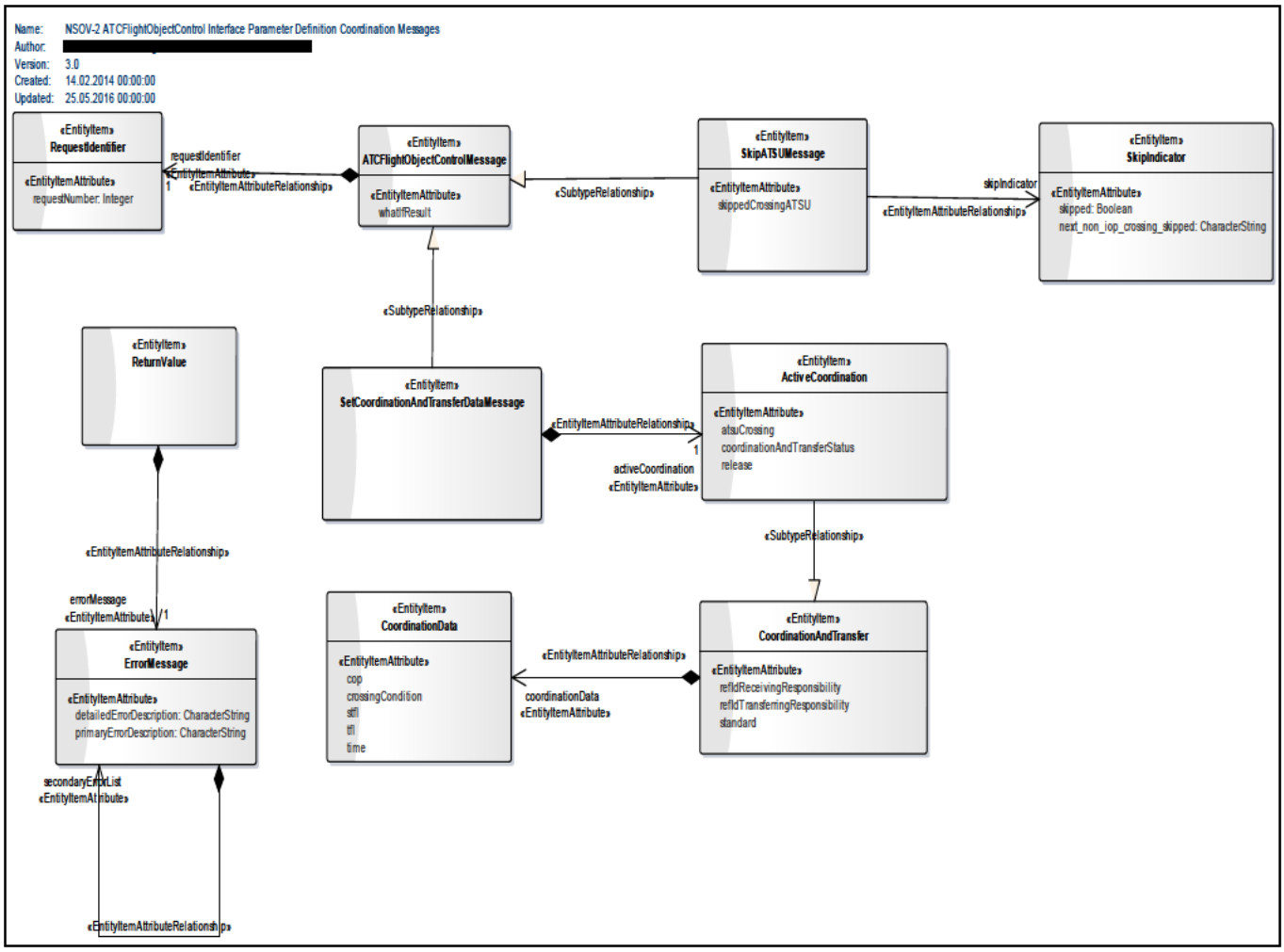

Figure 11: NSOV-2 ATCFlightObjectControl service interface parameter definition coordination messages

Input Parameter: The operation uses the message "SetCoordinationAndTransferDataMessage".

Output Parameter: The "ReturnValue" message is used for failure reporting.

5.3.1.2 Operation skipATSU

5.3.1.2.1 Operation Functionality

This operation is used for skipping an ATSU in a coordination dialogue.

It was required to allow a FDC to skip its next ATSU in the control sequence when it is operationally required.

5.3.1.2.2 Operation Parameters

Input Parameter: The operation uses the message "SkipATSUMessage".

Output Parameter: The "ReturnValue" message is used for failure reporting.

5.3.1.3 Operation establishComplementaryDistribution

This service request the addition of a IOP stakeholder into the distribution list of the flight object. The complementary distribution will be maintained until it is explicitly requested to stop this distribution.

A request for complementary distribution can be done for the following reasons: subscribed, pointed, duplicated and general information. In case of subscribed, the identifier of the stakeholder requesting the subscription shall be the same as the addressee of the data.

5.3.1.3.1 Operation Functionality

The operation establishes a complentary distribution with the pointed ATSU.

5.3.1.3.2 Operation Parameters

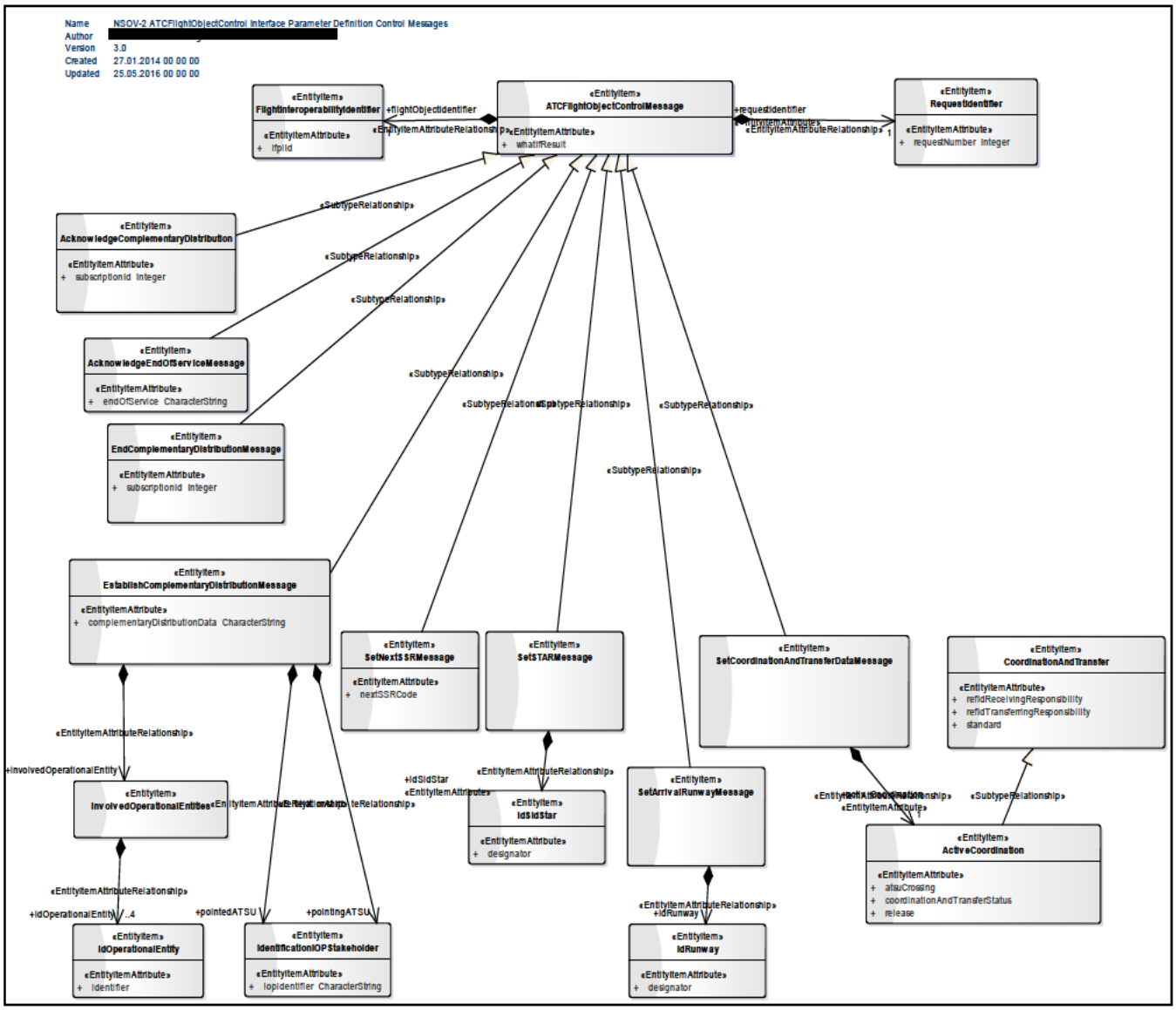

Figure 12: NSOV-2 ATCFlightObjectControl service interface parameter definition control messages

The operation uses the message "EstablishComplementaryDistributionMessage".

5.3.1.4 Operation acknowledgeComplementaryDistribution

Input Parameter: The pointed ATSU acknowledges the subscription to the complementary distribution.

Output Parameter: The "ReturnValue" message is used for failure reporting.

5.3.1.4.1 Operation Functionality

This operation is used for a contributor to acknowledge the reception of a complementary distribution.

If the SI providing the service is not the FDMP of the FO then it shall reject the service request.

If the requested SI is the FDMP it shall reject the service request if the requester is not the one that is receiving the complementary distribution.

5.3.1.4.2 Operation Parameters

Input Parameter: The operation uses the message ”AcknowledgeComplementaryDistribution”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.3.1.5 Operation endComplementaryDistribution

This operation is used for requesting the ending of a distribution previously requested.

If the SI providing the service is not the FDMP of the FO then it shall reject the service request.

If the requested SI is the FDMP it shall reject the service request if either:

- The requester is not the one that requested the distribution.
- The requester is not the one that is receiving the complementary distribution.

5.3.1.5.1 Operation Functionality

This operation ends the complementary distribution.

5.3.1.5.2 Operation Parameters

Input Parameter: The operation uses the message ”EndComplementaryDistributionMessage”

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.3.1.6 Operation setArrivalRunway

5.3.1.6.1 Operation Functionality

This operation sets the arrival runway for the flight in view.

This operation allows a contributor to pass the modification of the assigned arrival runway. It is linked with the capability to pass information to the FDMP.

The SI requesting the service shall contain the ADES of the FO to be modified in its AOR otherwise the request shall be rejected.

If the SI providing the service is not the FDMP of the FO to be modified then It shall reject the service request.

5.3.1.6.2 Operation Parameters

Input Parameter: The operation uses the message ”SetArrivalRunwayMessage”

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.3.1.7 Operation setNextSRR

5.3.1.7.1 Operation Functionality

This operation sets the next SSR code for a flight crossing AORs.

This operation allows a contributor to modify the SSR code it will allocate to the flight.

If the SI requesting the service is not the next expected FDC of the FO to be modified then the SI providing the service shall reject the service request.

If the SI providing the service is not the FDMP of the FO to be modified then it shall reject the service request.

5.3.1.7.2 Operation Parameters

Input Parameter: The operation uses the message ”SetNextSSRMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.3.1.8 Operation setSTAR

5.3.1.8.1 Operation Functionality

This service allows a contributor to change the STAR. It is linked with the capability to pass information to the FDMP.

If the initial point of the STAR is in the script the FDMP shall modify the script (route and constraints) from the selected STAR application point in order to fulfil the STAR.

If the initial point of the STAR is not in the current script the STAR change shall have been issued in with a change in the script to reach that point. (See Semantic check).

5.3.1.8.2 Operation Parameters

Input Parameter: The operation uses the message ”SetSTARMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.3.1.9 Operation acknowledgeEndOfService

5.3.1.9.1 Operation Functionality

This operation allows a FDC to inform the FDMP that it has received and agreed the FO with end of service distribution.

This service is required by the ATSUs that are no longer traversed by a flight to confirm their acceptance to be removed from the distribution list by the new FDMP.

5.3.1.9.2 Operation Parameters

Input Parameter: The operation uses the message ”AcknowledgeEndOfServiceMessage”.

Output Parameter: The “ReturnValue” message is used for failure reporting.

5.4 Payloads

Within this chapter a comprehensive list of all payload elements is provided.

Element Name	Author	Notes
ATCFlightObjectControlMessage	[redacted]	This is a generalization of all the various ATC Flight Object control messages. All ATC FLight OBject control messages have certain parameters in common (originator of the request and the request number)

Element Tagged Value Name	Value
encoding	

Attribute Name	Type	Notes
whatIfResult		This attributes indicates wether or not the coordination results are the result of a what-if

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:WhatIfFlight@alternativeFlightStatus

Element Name	Author	Notes
AcknowledgeComplementaryDistribution	[redacted]	This operation is used for a contributor to acknowledge the reception of a complementary distribution.

Element Tagged Value Name	Value
encoding	

Attribute Name	Type	Notes
subscriptionId	Integer	The subscription identifier that is acknowledge

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
AcknowledgeEndOfServiceMessage	[redacted]	This status informs the stakeholder that it is the last time it receives the Flight Object. For instance, when the flight leaves the AoI of a stakeholder this is the last status it received before being reloved from the distribution list.

Element Tagged Value Name	Value
encoding	

Attribute Name	Type	Notes
endOfService	CharacterString	This status informs the stakeholder that it is the last time it receives the Flight Object. For instance, when the flight leaves the AoI of a stakeholder this is the last status it received before being reloved from the distribution list.

Tagged Value Name	Value

	CLDMSemanticTrace	CLDM_out_of_scope	
Element Name		Author	Notes
ActiveCoordination		[redacted]	The structure of the active coordination. Coordination and transfer data to be requested to the FDMP.
	Attribute Name	Type	Notes
	atsuCrossing		The identifier of the upstream ATSU in the coordination. It is defined as the index of this ATSU in the ordered crossed ATSUs list
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Stakeholders:Stakeholder:Unit@designator	
	Attribute Name	Type	Notes
	coordinationAndTransferStatus		This field indicates the state of the coordination. It indicates the progression of the coordination from initial proposal through to the assumption of the flight. It holds the state of the coordination (between civilian ATSUs or between a civilian and a military ATSU or with an Oceanic centre)
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationAndTransfer@coordinationConditionStatus	
	Attribute Name	Type	Notes
	release		The reference to the release request that may cause the release of some constraints imposed on the flight during the coordination phase
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationAndTransfer@release	
Element Name		Author	Notes
CTACancelationMessage		[redacted]	Cancellation message for an previously agreed CTA.
Element Name		Author	Notes
CTAControlMessage		[redacted]	CTA Proposal from downstream ATSU to the a/c vie the C-ATSU.
	Attribute Name	Type	Notes
	ctaApplicationPoint		Metering Fix published point
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:ControlledTimeOver	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructu	

		rePoint:SignificantPoint@designator	
	Attribute Name	Type	Notes
	ctaStatus		CTA Status
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:ControlledTimeOver@ctaStatus	
	Attribute Name	Type	Notes
	ctaTime		time at metering point.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:OverArrivalPoint@cta	

Element Name	Author	Notes
Constraint	[redacted]	OCL: { Constraint.application_point->size = 1 implies Constraint.application time->size = 0 and Constraint.application_level->size = 0} { Constraint.application_level->size = 1 implies Constraint.application time->size = 0 and Constraint.application_point->size = 0} { Constraint.application_time->size = 1 implies Constraint.application level->size = 0 and Constraint.application_point->size = 0} { Constraint.constraint_handling = closed implies Constraint.target start point->size = 1 } { Constraint.constraint handling = closed implies Constraint.target_end_point->size = 1 } { Constraint.time_after_reference ->size = 1 implies Constraint.application distance ->size = 0} { Constraint.application distance ->size = 1 implies Constraint.time_after_reference ->size = 0} This class is the abstraction of a constraint to apply on the flight. Constraints are maintained within the flight script. They are characterised by a status which evolves during the flight life cycle according to the flight progression along its trajectory and the orders given.

	Attribute Name	Type	Notes

	applicationPoint		The identifier of the point at which the flight may begin to evolve to fulfil the constraint. It is defined as an index that points to the position of the route point in the Route.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint@applicationPoint	
	Attribute Name	Type	Notes
	category		This attribute represents the category of the constraint. It is useful to classify the constraints for the TP.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint@category	
	Attribute Name	Type	Notes
	constraint_handling		This attribute describes the open/closed status of the constraint. If the constraint it closed it shall be modelled in the trajectory.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint@constraintHandling	
	Attribute Name	Type	Notes
	identifier		The unique and static identifier of the constraint
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:Abstract:Entity@identifier	
	Attribute Name	Type	Notes
	policy	CharacterString	This attribute represents the policy of application of the constraint.
	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM_out_of_scope	
	Attribute Name	Type	Notes
	status		It applies to applied constraint and we try to fulfil. Depending on the result of the TP calculation we can have the following values: The constraint is fully reached: TRUE The constraint is reached later or never reached: FALSE
	Tagged Value Name	Value	

	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint@status

Attribute Name	Type	Notes
target_end_point		The point until where the constraint shall be fulfilled 2D.

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryPoint@inboundSegment

Attribute Name	Type	Notes
target_start_point		The point where the constraint shall start to be fulfilled.

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint@referencePoint

Element Name	Author	Notes
CoordinationAndTransfer	[redacted]	This class represents coordination and transfer data. Data concerning the boundary point are part of the trajectory, whereas data concerning the coordination point (COP) can be negociated. Once agreed, the coordination conditions can become constraints to be used in the trajectory prediction of the flight. Transfer conditions are always agreed and can also result in constraints.

Attribute Name	Type	Notes
refIdReceivingResponsibility		This field contains the receiving responsible for the given coordination length : 1..8

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationAndTransfer@receivingOe

Attribute Name	Type	Notes
refIdTransferringResponsibility		This field contains the transferring responsible for the given coordination length : 1..8

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationAndTransfer@transferringOe

Attribute Name	Type	Notes
standard		This attribute is true when coordination conditions are in accordance with pre-defined criteria (agreed coordination points, flight levels on these points, ADEP, ADES,

			time or distance limits after which coordination is considered non standard...)
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationAndTransfer@isStandardProcedureApplied	
Element Name	Author	Notes	
CoordinationData	[redacted]	This class contains the data relative to this coordination.	
	Attribute Name	Type	Notes
	cop		This field indicates the coordination point 2D.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationConditions@coordinationPoint	
	Attribute Name	Type	Notes
	crossingCondition		The crossing condition of this coordination.
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:AirspaceExit@exitedAirspace	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:AirspaceEntry@enteredAirspace	
	Attribute Name	Type	Notes
	stfl		This field indicates the supplementary level
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:TransferData@supplementaryFlightLevel	
	Attribute Name	Type	Notes
	tfl		This field indicates the coordination level.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:TransferData@assignedFlightLevel	
	Attribute Name	Type	Notes
	time		Coordination time provided as an string of four characters with the format "HHMM".
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:Coordination:CoordinationConditions@timeOverCoordinationPoint	
Element Name	Author	Notes	
DelayApportionmentProposalMess	[redacted]	Delay apportionment proposal for an	

age		[redacted]	ATSU whose AOR will be traversed by the flight.
	Attribute Name	Type	Notes
	meteringFix		Metering fix to which the delay apportionment is related.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:SignificantPoint@designator	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:AirTrafficOperations:TrafficSynchronization:MeteringFix	
	Attribute Name	Type	Notes
	timeAtMeteringFix		Time at which the a/c is supposed to be at metering fix.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:DelayApportionment	
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:OverMeteringFix@APTOM	
Element Name		Author	Notes
ETAMinMaxRequestMessage		[redacted]	ETA min/max request to the a/c via C-ATSU.
	Attribute Name	Type	Notes
	fixname		The optional name of the identified location for which the ETA is requested.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:AirspaceInfrastructurePoint:SignificantPoint@designator	
	Attribute Name	Type	Notes
	location		The location (lat / long) of the point for which the ETA was requested.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:Abstract:GeoEnabledEntity@position	
Element Name		Author	Notes
EndComplementaryDistributionMessage		[redacted]	EndComplementaryDistributionMessage
	Element Tagged Value Name	Value	
	encoding		
	Attribute Name	Type	Notes
	subscriptionId	Integer	Identifier of the subscription
	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM_out_of_scope	
Element Name		Author	Notes
ErrorMessage		[redacted]	Error message
	Attribute Name	Type	Notes
	detailedErrorDescription	CharacterString	A detailed description of the error.

	Tagged Value Name	Value
	CLDMSemanticTrace	CLDM_out_of_scope

	Attribute Name	Type	Notes
	primaryErrorDescription	CharacterString	Primary description of the error

	Tagged Value Name	Value
	CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
EstablishComplementaryDistributionMessage	[redacted]	EstablishComplementaryDistributionMessage

	Element Tagged Value Name	Value
	encoding	

	Attribute Name	Type	Notes
	complementaryDistributionData	CharacterString	In PH1, It gives the parameter to set a point session. - Pointing ATSU - Pointed ATSU - An identifier of the Point session - A free text with the reason for the pointing session

	Tagged Value Name	Value
	CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
ExpandedRoutePoint	[redacted]	ExpandedRoutePoint

	Attribute Name	Type	Notes
	airTrafficTypeChange		This field contains an indication of the change in the "type of flight" (OAT/GAT) associated to a point on the route. It is provided on the first route change.

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirTrafficOperations:DemandAndCapacityBalancing:TrafficCount@airTrafficType

	Attribute Name	Type	Notes
	derivedFromDCT		It indicates a DCT as source of the route point. It affects both DCTs coming from the flight plan and those that are the result of a clearance. It is set on the first route point of DCT segment.

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryPoint@derivedFromDirectRoute

	Attribute Name	Type	Notes
	flightRulesChange		This field contains an indication of a change in the "flight rules" (VFR/IFR) associated to a point on the route.

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightEvent:FlightRulesChange@flightRule
	IMDefinitionTrace	urn:x-

		ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightEvent:FlightRulesChange	
Attribute Name		Type	Notes
isCDR			NOT USED FOR PH1 It indicates a route point derived from a CDR.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:RouteAndProcedure:RouteAvailability@conditionalRouteType	
Attribute Name		Type	Notes
offsetInformation			NOT FOR PH1 This field specifies the offset information that is applicable to the expanded route.
	Tagged Value Name	Value	
	CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:Offset@side	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:Offset@distance	
Attribute Name		Type	Notes
origin			This field specifies the Route segment origin of the Expanded Route Point. This field is empty when the point does not belong to the definition of an ATS route.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:AirspaceInfrastructure:RouteAndProcedure:RouteSegment	
Attribute Name		Type	Notes
pointInformation			The information about the expanded route point.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryPoint@type	
Attribute Name		Type	Notes
status			This attribute describes the state of acceptance of the route point by the FDMP.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryPoint@acceptanceStatus	
Element Name		Author	Notes
FOConstraint		[redacted]	This is part of a standard exchange model: Mapped to FO>Constraint of the ED133 Standard

Element Name	Author	Notes
IdentificationIOPStakeholder	[redacted]	This class represents the unique identifier of an IOP Stakeholder.

Attribute Name	Type	Notes
iopidentifier	CharacterString	The identifier of the IOP Stakeholder.

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
InvolvedOperationalEntities	[redacted]	This class is a place holder that contains useful information about the duplication of flight data

Element Name	Author	Notes
ModifyConstraintsMessage	[redacted]	Message to modify a given constraint.

Element Tagged Value Name	Value
encoding	

Attribute Name	Type	Notes
appliedConstraintsListUpdate	Boolean	If true: The update is intended for the constraints list If false: The update is intended for the rejected constraints list.

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
firstChange	Integer	The position in the list of constraints of the first element to be modified.

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
lastChange	Integer	The position in the list of constraints of the last element to be modified.

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
ModifyOperationalIntentMessage	[redacted]	Message to modify an operational intent

Attribute Name	Type	Notes
identifier	CharacterString	identifier of the operational intent

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
ModifyRouteMessage	[redacted]	ModifyRouteMessage

Element Tagged Value Name	Value
encoding	

Attribute Name	Type	Notes
first_change	Integer	The position of the first element of the expanded route to be modified

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
last_change	Integer	The position in the expanded route of the last element to be modified

Tagged Value Name	Value

	CLDMSemanticTrace	CLDM_out_of_scope	
Element Name		Author	Notes
PartialDelayApportionment		[redacted]	Partial delay apportionment per AOR.
	Attribute Name	Type	Notes
	partialTimeToLoseOrGain		Delay apportionment for the downstream AOR.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:PartialDelayApportionment@partialTimeToLoseOrGain	
	Attribute Name	Type	Notes
	unitName		The name of the unit that shall take this part of the RTA into account. The name shall be as defined in AIXM V5.
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Stakeholders:Stakeholder:Unit@designator	
Element Name		Author	Notes
RTAAcceptanceMessage		[redacted]	message to accept the RTA
Element Name		Author	Notes
RTARejectionMessage		[redacted]	The RTA rejection if an ATSU can not adhere to the proposed delay apportionment.
Element Name		Author	Notes
RejectedConstraints		[redacted]	The set of constraints that have been rejected and so are not considered in the trajectory calculation.
	Attribute Name	Type	Notes
	reasonForRejection		Reason for Rejection
	Tagged Value Name	Value	
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint@reasonForRejection	
Element Name		Author	Notes
RemoveConstraintsMessage		[redacted]	Meaage to remove a constraint from the script.
	Attribute Name	Type	Notes
	identifier	Character	Unique identifier of the constraint to be removed from the flight script.
	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM_out_of_scope	
Element Name		Author	Notes
RemoveOperationalIntentMessage		[redacted]	Message to remove an operational intent
	Attribute Name	Type	Notes
	identifier	CharacterString	identifier of the operational intent
	Tagged Value Name	Value	
	CLDMSemanticTrace	CLDM_out_of_scope	

Element Name	Author	Notes
ReportCode	[redacted]	Describes the output for an operation.

Attribute Name	Type	Notes
reportCode	Boolean	The invocation for the operation is OK or not OK.

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Element Name	Author	Notes
ReturnValue	[redacted]	Describes the output for a single operation.

Element Name	Author	Notes
SetArrivalRunwayMessage	[redacted]	SetArrivalRunwayMessage

Element Tagged Value Name	Value
encoding	

Element Name	Author	Notes
SetConstraintsMessage	[redacted]	Message to set a new constraint

Element Name	Author	Notes
SetCoordinationAndTransferDataMessage	[redacted]	SetCoordinationAndTransferDataMessage

Element Tagged Value Name	Value
encoding	

Element Name	Author	Notes
SetNextSSRMessage	[redacted]	SetNextSSRMessage

Element Tagged Value Name	Value
encoding	

Attribute Name	Type	Notes
nextSSRCode		The SSR code of the aircraft to which the flight will respond when under the control of the next downstream unit.

Tagged Value Name	Value
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:FlightIdentifier:SSRCode@code

Element Name	Author	Notes
SetOperationalIntentMessage	[redacted]	Message to set the operational intend in the flight script.

Attribute Name	Type	Notes
identifier	CharacterString	This attribute is the unique and static identifier of the operational intent.

Tagged Value Name	Value
CLDMSemanticTrace	CLDM_out_of_scope

Attribute Name	Type	Notes
linkedConstraints		The constraints coming from this operational intent.

Tagged Value Name	Value
CLDMContexTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:Abstract:Entity@identifier
IMDefinitionTrace	urn:x-

		ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:Trajectory:TrajectoryConstraint	
Attribute Name	Type	Notes	
linkedExpandedRoutePoints		New sequence of points of the expanded route linked with this operational intent.	
Tagged Value Name	Value		
CLDMContextTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Trajectory:TrajectoryPoint		
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:Abstract:Entity@identifier		
Attribute Name	Type	Notes	
sendingTime		The time when the operational intent has been given.	
Tagged Value Name	Value		
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:Abstract:TemporalEnabledEntity@startValidity		
Element Name	Author	Notes	
SetSTARMessage	[redacted]	SetSTARMessage	
Element Tagged Value Name	Value		
encoding			
Element Name	Author	Notes	
SkipATSUMessage	[redacted]	SkipATSUMessage	
Element Tagged Value Name	Value		
encoding			
Attribute Name	Type	Notes	
skippedCrossingATSU		The unique identifier of the ATSU crossing in the list of crossings.	
Tagged Value Name	Value		
CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Stakeholders:Stakeholder:Unit@designator		
Element Name	Author	Notes	
SkipIndicator	[redacted]	Indicates whether the ATSU is skipped or not	
Attribute Name	Type	Notes	
skipped	Boolean	the ATSU crossing is skipped.	
Tagged Value Name	Value		
CLDMSemanticTrace	CLDM_out_of_scope		
Attribute Name	Type	Notes	
next_non_iop_crossing_skipped	CharacterString	Following the present ATSU crossing, there is a crossing of a non IOP ATSU before entering the IOP area again, and the non IOP ATSU is skipped.	
Tagged Value Name	Value		
CLDMSemanticTrace	CLDM_out_of_scope		
Element Name	Author	Notes	
FlightInteroperabilityIdentifier	[redacted]	Unique identifier of the Flight Object. This class is already proposed to be added (back) into the AIRM via CR0051	

	Attribute Name	Type	Notes
	ifplId		The unique identifier allocated by the IFPS.

	Tagged Value Name	Value
	CLDMSemanticTrace	urn:x-ses:sesarju:airm:v410:ConsolidatedLogicalDataModel:SubjectFields:Flight:Flight@ifplIdentifier
	IMDefinitionTrace	urn:x-ses:sesarju:airm:v410:InformationModel:SubjectFields:Flight:FlightIdentifier:IFPLIdentifier

Element Name	Author	Notes
ATCFlightObjectControl	[redacted]	The ATC Flight Object Control service allows consumers to request a number of changes to a Flight Object which is being managed by the service provider. The service implements functionality as defined in the EUROCAE ED-133 standard

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
FlightObjectContributor	[redacted]	Consumer for ATCFlightObject service (Atcfoc_cnsmr)

Element Name	Author	Notes
AcquireChangeOfManagerPublisherResponsibility	[redacted]	The feature supports management of the change of Manager/Publisher. It requires that identification of the Manager/Publisher exists within the flight-object. The “MERGE IOP FLIGHT-OBJECT” capability enables a system to learn about the successive systems taking the role of Manager/Publisher. When a new Manager/Publisher declares itself (as the Manager/Publisher) and starts publishing the flight-object, two kinds of System will receive the update: the former Manager/Publisher (see § A.2.1.1.4.2) who has become a User (interested in the flight as long as the flight is still inside its AOI), and the other Contributors (see § A.2.1.1.4.1) who remain Contributors.

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
AcquireInformationOnFlightGeneralInformationPurposes	[redacted]	This capability corresponds to the User who receives flight object updates on a flight for “general information” purposes. It is possible that the flight traverses neither its AOR nor its AOI-awareness. The flight is distributed to this User because of static or dynamic distribution rules. Operationally, this could represent the point function situation (including a

		maintained duplication between ATSUs). This ability can apply also for non-ATSUs stakeholders, like APOP or CFMU, who are interested in receiving general information on a subset of the traffic. Main inputs: Flight-Object update. Main results: The system is informed of the flight (or "no longer informed") Main outputs: None. The capability implies the following activities: Analysis of the distribution list of the flight object to verify if the User is present in this list and determine the reason for the information, or to be aware that it is no longer informed (§ A.2.2.7.1). Making available the flight information within the system. see ED133 V1.0

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
AcquireInformationOnIncomingFlight	[redacted]	This ability enables the Contributor system to be aware of the existence of a flight, or of the latest information on a flight, planned to traverse its AOR in the future. Changes to the flight can come from actions performed at a system upstream, or downstream, of the Contributor system. Main inputs: Flight-Object update Main results: Amended/new SFPL that reflects the changes that other IOP stakeholders have made. Main outputs: Possibly a request to the Manager/Publisher for changes to the flight-object if the locally available information is not yet present in the received flight-object. Description: The ability implies the following activities: Verification that the Flight-Object is of interest to this system (described at § A.2.2.6.2) Retrieval/Creation of the SFPL that corresponds to the updated Flight-Object (described at §A.2.2.5.2)

		Align the "general data" (described at §A.2.2.5.4) Alignment of the local SFPL flight-script with the Flight-Object flight-script (described at §A.2.2.3.3.3) for the common parts of the script [1]. Computation of the local SFPL planned trajectory. (Described at §A.2.2.4.1). Checking of alignment between the local SFPL planned trajectory and the Flight-Object planned trajectory (described at §A.2.2.4.2) for the AOR and the AOI-awareness of the system. Providing the Manager/Publisher with the locally set constraints that the Manager/Publisher is missing. (§ A.2.1.2.1) ---------- [1] The scope of the flight script can be defined locally in each system implementation, at least for the flights for which the system is not currently the manager. This scope can vary between the AOI-awareness area (minimum extent) and the whole IOP area (maximal extent). When the system instance belongs to a cluster (Regional view), the scope of the flight script in the SFPL is at least the AOR/AOI-awareness of the cluster.

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
AcquireInformationOnLeavingFlight	[redacted]	This ability enables the Contributor system to become aware of the last information on a flight that has traversed its AOR and is currently traversing the AOI-Awareness. Main inputs: Flight-Object update Main results: Amended SFPL that reflects the changes that other IOP stakeholders have made. Main outputs: None. Description: The ability implies the following activities: : Verification that the Flight-Object is still of interest to this system (described at § A.2.2.6.2) Retrieval/Creation of the SFPL that

		corresponds to the updated Flight-Object (described at §A.2.2.5.2) Align the "general data" (described at §A.2.2.5.4) Alignment of the local SFPL flight-script with the Flight-Object flight-script (described at §A.2.2.3.3.3) for the common parts of the script. Computation of the local SFPL planned trajectory starting from the current aircraft position given in the flight-object and onwards through the AOR and the AOI-awareness. Checking of alignment between the local SFPL planned trajectory and the Flight-Object planned trajectory (described at §A.2.2.4.2) for the AOI-awareness of the system.

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
AcquireInformationOnVicinityFlight	[redacted]	This ability enables a User ATC system to obtain up-to-date information on a flight operating in the vicinity (Awareness-AOI) of the ATSUs that it serves. The Manager/Publisher deems that at least one the ATSUs of the system to which the Manager/Publisher distributes the object is interested in the flight. The flight does not enter in the AOR of any of these ATSUs. This capability also enables a User from a non-ATC system to receive up-to-date information on a flight it is interested in. Main inputs: Flight-Object update Main results: Amended/new SFPL (flight information) that reflects the changes that other IOP stakeholders have made. Main outputs: None. Description: The capability implies the following activities: Verification that the Flight-Object is of interest to this system (described at § A.2.2.6.2) Retrieval/Creation of the SFPL that corresponds to the updated Flight-Object (described at § A.2.2.5.2) Align the "general data" (described at

		§A.2.2.5.4) Alignment of the flight-script of the SFPL with the one in the Flight-Object (described at §A.2.2.3.3.3) over the AOI-awareness If the User is an ATC system it may compute the planned trajectory, including tactical decisions, for the AOI-awareness. If the User is an ATC system it may check the alignment of the planned trajectory of the SFPL with the one in the Flight-Object (described at §A.2.2.4.2) for the AOI-awareness of the system. See Ed133 v1.0

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
AcquireNewFDMPWhenByFormerFDMP	[redacted]	This particular case is for when the system receiving the Flight-Object update was, until now, itself the Manager/Publisher of this flight-object. <u>Main inputs:</u> Flight-Object update indicating a change of Manager/Publisher. This update is made by the new Manager/Publisher. <u>Main results:</u> The former Manager/Publisher becomes a Contributor. <u>Main outputs:</u> None. The capability implies the following activities: Verification that the change of Manager/Publisher is valid (the transfer of responsibility had been proposed to another system or the route has changed so that another system is the first IOP stakeholder traversed in the IOP area). If the change is deemed invalid, then the processing under “alternative flow 1” applies. (§ A.2.2.1.1.2.2) Remembering the identity of the new Manager/Publisher Alternative flow 1: Referral to an eligible operator for manual confirmation whether their system is still the Manager/Publisher of the flight-object. If the operator confirms the former Manager/Publisher:

		Distribution of the flight-object representing the local SFPL to the IOP stakeholders (§A.2.2.7.1) including a tag indicating that manual arbitration has taken place. If the operator confirms the change of Manager/Publisher: Remember the identity of the new Manager/Publisher See ED133 v.10
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
AcquireNewFDMPWhenFDC	[redacted]	Main inputs: Flight-Object update indicating a change of Manager/Publisher. This update is made by the new Manager/Publisher. Main results: The Contributor (or the User) is aware of who the new Manager/Publisher is. Main outputs: None. Description: The capability implies the following activities: Verification that the Flight-Object is still of interest to its system (described at § A.2.2.6.2) Retaining the identity of the new Manager/Publisher Described as the 'regular case"in para A.2.1.1.4.1 of ED133 v1.0.
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
AcquireSFPLCreationWhenFDMP	[redacted]	The ability implies the following activities: The system creates the first release of the SFPL. The system calculates the FDMP, starting with use of the SFPL. In the case where the system is the FDMP, It searches for the FO, to find out if a flight-object already exists with the same operational key (§ A.2.2.5.1). If the search indicates the existence of a corresponding flight-object, <ul style="margin-bottom:

		0mm; list-style-type: circle; "> The FDMP acquires information from that flight-object. The FDMP builds a consistent FO by merging its SFPL data and the retrieved data from the already existing FO. If the search does not indicate the existence of a corresponding flight-object, The FDMP constructs the flight object. The system verifies if, based on the completed flight object, it is or not the FDMP (described at § A.2.2.1.1.2). If this ATSU is still the FDMP. Distribution is made of the flight-object (described at § A.2.1.2.6). If this ATSU is no longer the FDMP The system passes the changes (if any) to be applied to the flight-object to the correct FDMP (§ A.2.1.2.1).

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
AcquireSFPLWhenFDC	[redacted]	The ability implies the following activities: The system creates the first release of the SFPL. The system calculates the FDMP, starting with use of the SFPL. In the case where the system is not the FDMP, It searches for the FO, to find out if a flight-object already exists with the same operational key (§ A.2.2.5.1). If the search indicates the existence of a corresponding flight-object, The FDC acquires information from that flight-object. The FDC detects the modification to the FO needing to be provided to the FDMP. If the search does not indicate the existence of a corresponding flight-object, The FDC collects the information to provide to the FDMP. The system provides the information to the proper FDMP.

	Element Tagged Value Name	Value	
	megaid		
Element Name		Author	Notes
AcquisitionByAnFDMPOfTheRequestForChangeFromAnFDC		[redacted]	Main inputs: A request to add changes to the flight-object received from a FDC. Main outputs: A new release of the flight-object is distributed to the interested FDC and Users. See A.2.1.2.2 of ED133
	Element Tagged Value Name	Value	
	megaid		
Element Name		Author	Notes
AcquisitionOfTheSFPLCreation		[redacted]	Main inputs: Any input made locally at an ATSU and leading to creation of a new SFPL. This input may be a local CWP input, or some non-IOP partners input (e.g. co-ordination messages from some adjacent ATSU), etc. Main outputs: A new release of the flight-object is ready to be shared, by the FDMP, with the other systems (published directly, or a request is made to amend an existing flight-object). See A.2.1.2.3 of ED133
	Element Tagged Value Name	Value	
	megaid		
Element Name		Author	Notes
AcquisitionOfTheSFPLDeletion		[redacted]	This ability handels the deletion of a flights information that is being shared through flight-objects. The following operational cases are considered: The flight is cancelled. The ATSU that becomes aware of this must share the knowledge with other IOP stakeholders. To solve technical malfunctions, an ATSU may needs to delete a SFPL whilst the flight still exists. The ATSU will then need to create another SFPL to support the conduct of the flight. See A.2.1.2.4 of ED133
	Element Tagged Value Name	Value	

	megaid	
Element Name	Author	Notes
CheckEligibilityOfSubmittedChanges	[redacted]	This ability corresponds to Contributors who receive flight object updates on a flight. The receiving Contributors check that the Manager/Publisher has the eligibility to execute the modification within a flight data. Main inputs: Flight-Object update. Main results: The system updates its SFPL or indicates its rejection. Main outputs: Noormaly none. The ability implies the following activities: Reception of a Flight Object update. Checking the eligibility of the publishing system that published the FO (§ A.2.2.2.1.1).
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ConstructionOfTheFlightObjectByTheFDMP	[redacted]	Main inputs: A new release of the SFPL is available in an ATSU system with the FDMP role. Main outputs: A new release of the flight-object is provided to be shared with the other IOP stakeholders. Description: The capability implies the following activities: Updating of a SFPL. Alignment of the “general data” (described at §A.2.2.5.4). Identification of changed constraints (modified, added or removed) compared to the previous release of the SFPL (§ A.2.2.3.2.1) over the IOP area. Computation of the SFPL planned trajectory for the IOP area. Computation of the crossed volumes, and identification of the crossed ATSUs based on the SFPL planned trajectory across the whole IOP area. See A.2.1.2.5 of ED133
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes

DistributeIOPFlightObjectData	[redacted]	This capability enables the FDMP to share the last information it has on a given flight to the other IOP stakeholders. The capability is useful for systems instances that are currently FDCs of the flight-object to keep their FDMP informed of the changes affecting the flight represented by the flight-object (§A.2.1.2.1). Moreover, it is useful for the FDMP to dispatch the information it has gathered to the other systems instances (§A.2.1.2.6) See para A.2.1.2 of ED133 v1.0

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
DistributionOfInformationByTheFDMP	[redacted]	Main inputs: A FDMP system has a new release of a flight-object available (see § A.2.1.2.5) Main outputs: Flight-Object update Description: The capability implies the following activities: Identification of the distribution list in accordance with filtering rules (§A.2.2.6.1.1.1and § A.2.2.6.1.1.2) Distribution of the Flight Object to the appropriate IOP stakeholders (§ A.2.2.6.1.1.2) See A.2.1.2.6 of ED133

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
FDCCancelsFlight	[redacted]	A FDC requires the cancellation: It notifies the cancellation to the proper FDMP. For “Cancellation Notification” the system verifies if, based on that release of the SFPL, it is or iis not the FDMP (described at § A.2.2.1.1.2) If the system that received the notification is the correct FDMP; It distributes the flight-object cancellation notification (described at § A.2.1.2.6) If the system that received the notification is not the correct FDMP: <ul style="margin-bottom: 0mm; list-style-

		type: disk; "> It rejects the request to cancel the flight-object. The requester will use the FO identification to search for the correct Manager/Publisher in the IOP area. When a FDC receives a cancellation of the flight-object, it initiates the cancellation of its SFPL according to its local requirements (these are outside of the scope of the ED-133 Specification).

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
FDMPCancelsFlight	[redacted]	The FDMP requires the cancellation It cancels the SFPL and shares the FO cancellation with other partners.

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
FlightCancelled	[redacted]	<u>Main inputs:</u> Any input made locally (except for a malfunction) that leads to cancellation of a SFPL that is being shared through the flight-object, e.g. local CWP input, etc. A cancellation message is received from an upstream non IOP-capable stakeholder. A flight cancellation message received from the IFPS (CNL) <u>Main outputs:</u> The FDMP shares this Flight Object deletion See A.2.1.2.4.1 of Ed133

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
IOPCoordination	[redacted]	This ability enables the ATSUs to establish the coordination parameters for a flight, using the current FDMP. The ability is useful for the ATSUs needing to coordinated with their downstream ATSUs, and may even be needed before they control the flight i.e. for anticipation of the coordination and well in advance of the COP (Coordination point) time. However, coordination event times themselves are an internal issue for the ATSUs involved.

		Important facts to be taken into account for IOP based coordination are: Only inter-centre coordination cases will be addressed within the IOP. Whilst the IOP mechanisms will replace the legacy mechanisms (i.e. OLDI), the negotiation activity itself should be addressed by the IOP, and not just the mechanism related aspects. Distribution of the FO does not always mean that the whole FO data will always need to be be distributed. The information in the FO will be clustered.

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
InitiationOfAnInterCentreCoordination	[redacted]	<u>Main inputs:</u> Any local event that triggers the start of the coordination dialogue with the adjacent ATSU. These local events include manual events (i.e. from CWPs), or automatic ones. <u>Main outputs:</u> If the local event was received in an ATSU system operating in a contributor role for the flight, a request is provided to the FDMP to perform a coordination proposal, from the requesting ATSU, to an adjacent external ATSU. A FO update with the proposed crossing conditions. <u>Description:</u> The ability implies the following activities: An internal event triggers the ATSU system to update its coordination data with an adjacent ATSU. If the initiating ATSU system is not the FDMP of the flight being coordinated then it requests the FDMP to change the crossing conditions. The FDMP updates the coordination data in the FO with the new crossing conditions and sets the coordination state between the coordinating ATSUs (for that flight) as PROPOSAL and distributes the FO (see § A.2.2.6.1.1.2). Interested ATSUs systems (according to filtering conditions) receive the FO and, in particular, this includes the coordinating ATSUs (see § A.2.2.6.1.1.1). See A.2.1.3.1 of ED133

	Element Tagged Value Name	Value

	megaid	
Element Name	Author	Notes
InterCentreCoordinationReleaseResponse	[redacted]	Main inputs: The reception of a flight object with coordination data with an adjacent ATSU in RELEASE REQUEST state. Main outputs: If the local event was received in an ATSU whose system is operating in a contributor role for the flight, a flight object update request is provided to the FDMP to confirm/reject the coordination release request received in the FO. An FO update with the confirmation/rejection of the release request. Description: The system performs the following operations: An FO with a RELEASE REQUEST for a previously established coordination is received. The controller accepts or rejects the release request: If the release request is accepted Provided the requested ATSU system is not the FDMP of the flight being coordinated, it then notifies the FDMP that the release request has been accepted. The FDMP sets the coordination state to RELEASED. The FDMP shall reflect the release indication in the flight script. The FDMP constructs a new release of the flight-object (see § A.2.1.2.5). The FDMP distributes the new release of the flight-object (see § A.2.1.2.6). The coordination dialog is ended. If the release request is not accepted When rejected Provided the requested ATSU system is not the FDMP of the flight being coordinated, it then notifies the FDMP that the release request has been

		rejected The FDMP leaves the coordination state unchanged, i.e. COORDINATED. The FDMP constructs a new release of the flight-object (see § A.2.1.2.5). The FDMP distributes the new release of the flight-object (see § A.2.1.2.6). Upon reception of the rejection by the ATSU system that initiated the release request, the controller must be warned that the current coordination dialog was ended without agreement. The current coordination dialog is ended. See A.2.1.3.5 of ED133

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
InterCentreCoordinationReleaseRequest	[redacted]	Main inputs: A controller of one of the involved ATSUs in a coordination requests the release of the already agreed crossing conditions. Main outputs: If the local event was received in an ATSU whose system is operating in a contributor role for the flight, a flight object update request is provided to the FDMP to perform a coordination release. An FO update with the proposed release of the crossing conditions. Description: A releasing request may only be performed for a coordination dialogue in the COORDINATED state. The capability implies the following activities: An internal event triggers the system to release its coordination condition data with an adjacent ATSU. If the ATSU requesting the release is not the FDMP of the flight being coordinated, it requests to the FDMP to release the current the crossing conditions. The FDMP updates the coordination data in the FO, setting the coordination state between the coordinating ATSUs (for that flight) as RELEASE REQUEST, and distributes the FO. Interested ATSUs (according to filtering conditions) receive the FO and, in particular, this includes the coordinated ATSUs (see § A.2.2.6.1.1).

		See A.2.1.3.4 of ED133
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ManageFlightObject	[redacted]	ManageFlightObject
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
MergeIOPFlightObject	[redacted]	This ability enables an IOP stakeholder with the role of Contributor, or User, to become aware of the last information that the Manager/Publisher has published. In particular, the Contributor, or User, uses this capability To be aware of flight script and trajectory changes in the flight-object To verify that their submitted changes have been incorporated into the flight-object (§A.2.1.1.5) To detect a change in the flight object management information(§ A.2.1.1.4) To be aware that it is becoming informed (or no longer informed) of a flight object (§ A.2.1.1.7) The use, described in a) above, depends on the relative location of the flight with respect to the Contributor, or User, AOR: Vicinity flights: The flight does not traverse the AOR of the User but will traverse its AOI-awareness or it is distributed for information (Duplication, point, regional view (§A.2.1.1.1 and A.2.1.1.7) Incoming flights: The flight will traverse the AOR of the Contributor in the future (§ A.2.1.1.2) Leaving flights: The flight has traversed the AOR of the Contributor and is now traversing its AOI-awareness “outbound” (§ A.2.1.1.3) See para A.2.1.1 of ED133 v1.0
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
PassingInformationToTheFDMP	[redacted]	<u>Main inputs:</u> Any input locally made at a FDC that modifies some information in the SFPL and results in a change in the flight-

		object. This could be a local CWP input, an input received from tools (e.g. AMAN, DMAN, etc.) or some non-IOP partners (co-ordination messages from some adjacent ATSU), etc. Reception of a new Flight Object. Reception of a FO that does not contain a previously requested constraint. Main outputs: A request to the FDMP to add changes to the flight-object if some locally available information is not yet known to the other IOP stakeholders. See para A.2.1.2.1 of Ed133
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ProvideATCFlightObjectInformationCluster	[redacted]	This ability allows a system to subscribe to the information contained within a Flight Object. It allows the subscriber to specify which flights are of interest by specifying (e.g. all flights departing from a specified airport) as well as which parts of the Flight Object it wishes to received.
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
RegionalView	[redacted]	Many regions, and National areas, are composed of different ATSUs. For some functions, the split between the ATSUs has to be masked as the functions are operated at the Regional level (i.e. at the level of a National area, e.g. within France). This produces two fold problem: To maintain flight data relative to the whole Region. In the proposed solution, the FDMP maintains the flight script and trajectory over the whole of an IOP area which covers the Region (provided all systems within are IOP-capable). To make flight data available for any flight within the whole Region. The principle is to declare that each ATSU operating for the same Region is part of a group of ATSUs that is statically defined within the IOP AIM. The FDMP then knows the ATSUs belonging to the same Region (from the IOP AIM data) and can applies a rule to distribute every FO that is sent to any of the ATSUs belonging to the Region to all

		the ATSU in the Region. Note that this capability is “read-only”. This additional distribution rule provides for the problems outlined above. However, just because they are in the same region, it does not provide the FDC role to these additional ATSUs that also receive the Fligth Object. See para A.2.1.4 of ED133 v1.0

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
ResponseToACounterProposalFromAnAdjacentATSU	[redacted]	Main inputs: The reception of a flight object by an ATSU system with a counter-proposal in the coordination data. Main outputs: If the local event was received in an ATSU whose system is operating in a contributor role for the flight, a flight object update request is provided to the FDMP to confirm/reject the coordination counter-proposal received in the FO. An FO update with the confirmation/rejection of the proposed crossing conditions. Description: The capability implies the following activities: An FO with a counter-proposal to a previously requested coordination is received. The ATSU system analyses the counter proposed crossing conditions received in the FO. Then, If the proposal is accepted Provided the requested ATSU system is not the FDMP of the flight being coordinated, it then notifies the FDMP that the counter proposal crossing conditions have been accepted. The FDMP leaves the crossing conditions unchanged and sets the coordination

		state to COORDINATED. The FDMP updates the flight script to be coherent with the agreed crossing conditions. The FDMP constructs a new release of the flight-object (see § A.2.1.2.5). The FDMP distributes the new release of the flight-object (see § A.2.1.2.6). The coordination dialog is ended. If the proposal is not accepted If rejected Provided the requested ATSU system is not the FDMP of the flight being coordinated, it then notifies the FDMP that the counter proposal crossing conditions have been rejected. The FDMP leaves the crossing conditions unchanged and sets the coordination state to NOT COORDINATED. The FDMP constructs a new release of the flight-object (see § A.2.1.2.5). The FDMP distributes the new release of the flight-object (see § A.2.1.2.6). The coordination dialog is ended. The controller is warned, so that a new coordination can be negotiated. See A.2.1.3.3 of ED133

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
ResponseToAnInterCentreCoordination	[redacted]	Main inputs: The reception of a flight object by an ATSU system that contains coordination data with an adjacent ATSU in PROPOSAL state. Main outputs: If the local event was received in an ATSU whose system is operating in a contributor role for the flight: Either: a flight object update request to the FDMP, to confirm/reject the coordination proposal received in the FO; Or, a flight object update request to the FDMP, to perform a new counter-proposal.

		Either: an FO update with the confirmation/rejection of the proposed crossing conditions; Or, an FO update with the Counter proposed crossing conditions. <u>Description:</u> The capability implies the following activities: An FO is received that contains coordination data with an adjacent ATSU in PROPOSAL state. The requested ATSU system that receives this FO analyses the crossing conditions within the FO. Using internal considerations, the analysis may be automatically performed, or presented to a controller for action. Then, If the proposal is accepted Provided the requested ATSU system is not the FDMP of the flight being coordinated it then notifies the FDMP that the crossing conditions have been accepted. The FDMP leaves the crossing conditions unchanged and sets the coordination state to COORDINATED. The FDMP updates the flight script to be coherent with the agreed crossing conditions. The FDMP constructs a new release of the flight-object (see § A.2.1.2.5). The FDMP distributes the new release of the flight-object (see § A.2.1.2.6). The coordination dialog is ended. If the proposal is not accepted If Rejected Provided the requested ATSU system is not the FDMP of the flight being coordinated, it then notifies the FDMP that the crossing conditions have been rejected. The FDMP leaves the crossing conditions unchanged and sets the coordination state to NOT COORDINATED. The FDMP constructs a new release of the flight-object (see § A.2.1.2.5). The FDMP distributes the new release of the flight-object (see § A.2.1.2.6).

		Upon reception of the rejection by the ATSU system that initiated the coordination, the controller must be warned that the current coordination dialog was ended without agreement (in order that a new coordination can be proposed). The current coordination dialog is ended. If a Counter-Proposal If the requested ATSU system is not the FDMP of the flight being coordinated, then it informs to the FDMP that new crossing conditions are proposed. The FDMP updates the crossing conditions and sets the coordination state to COUNTER-PROPOSAL. The FDMP constructs a new release of the flight-object (see § A.2.1.2.5). The FDMP distributes the new release of the flight-object (see § A.2.1.2.6). See A.2.1.3.2 of ED133.

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
SFPLDeletion	[redacted]	SFPLDeletion

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
SFPLDeletionByFDC	[redacted]	The ability implies the following activities: The ATSU system decides that the SFPL must be deleted from its system. The system detaches the Flight-Object from the SFPL. From now on, there is no further data exchange between them and they will evolve separately. If the system is not the FDMP of the affected flight-object: The ATSU system responds with “detached” to any request for dialogue (accept/reject some proposal or what-if) for the flight-object coming from the FDMP. The ATSU system suspends linkage of the flight-object to the SFPL. The ATSU deletes the SFPL that caused the trouble fom its system.

		Steps are taken inside the system to re-build the SFPL (e.g. manual actions etc.,) These is outside the scope of the ED-133 Specification. When the SFPL is again available, the ATSU start to re-align the SFPL with the Flight-Object and attaches the Flight-Object to the new SFPL. The SFPL is built from the latest version of the Flight object. Refer to § A.2.1.2.3. From now on, the FDC resumes its usual role with the flight-object. Operationally, the behaviour of the system, with FDC role and where the technical deletion was required, will be visible from the absence of operational responses to proposals. For the coordination and transfer phases, this will produce the same situation as in legacy systems, when the OLDI lines are down, or a SFPL is localy deleted for a technical reasons. Telephone coordination and manual inputs provide the work-arounds for thse situations. Other ATSUs still benefit from the IOP during this period. See A.2.1.2.4.2 of ED133

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
SFPLDeletionByFDMP	[redacted]	The ability implies the following activities: The ATSU system decides that the SFPL must be deleted from its system. The system detaches the Flight-Object from the SFPL. From now on, there is no further data exchange between them and they will evolve separately. If the system is the current Flight Data Manger/Publisher of the affected flight-object: It responds with “detached” to any request for change to this flight-object coming from the FDC. The ATSU system deletes the SFPL that caused the trouble and publishes a new release of the FO indicating that the FO is detached from its SFPL. Steps are taken inside the ATSU to build again the SFPL (e.g. manual actions). These is outside the scope of the ED-133 Specification.

		If this situation remains beyond a predefined time the next expected FDMP for this FO takes the initiative and assumes the role of FDMP and will FDMP publish a new FO. So, all the IOP systems are aware of this temporary situation. When the SFPL is again available, the ATSU re-aligns the Flight-Object (which was frozen since the detachment) with the SFPL and attaches the Flight-Object to the new SFPL. The FDMP now resumes its usual role with the flight-object by taking back the FDMP role. Note, it assumes its FDMP role by publishing the FO, so all the ATSUs are aware of the return to the normal state for the FO. Operationally, IOP is not available during the period whilst the system of the FDMP is re-establishing an SFPL that it can work with. The flight-object is frozen. If this situation lasts beyond a system parameter time, an ownership change will take place to allow the FO to be modified while the system is recovering its normal state for the FO. See A.2.1.2.4.2 of ED133

	Element Tagged Value Name	Value
	megaid	

Element Name	Author	Notes
StoringRegionalFlights	[redacted]	Main inputs: Flight-Object update Main results: The flight-object is stored in an SFPL which is available for tools operating at the Regional level and to support the Fast-Recovery (§ A.2.2.5.6). Main outputs: None. Description: The capability implies the following activities: Retrieval/Creation of the SFPL that corresponds to the updated Flight-Object (described at § A.2.2.5.2). Copy the “general data” and the flight-script into the SFPL. Store locally the updated SFPL. See A.2.1.4.1 of ED133

	Element Tagged Value Name	Value	
	megaid		
Element Name		Author	Notes
TransferringAFlight		[redacted]	Main inputs: Any local event that triggers the start of the transfer phase, either in the upstream or downstream ATSU. These local events include manual (e.g. from CWPs) or automatic ones. Main outputs: If the local event was received in an ATSU whose system is operating in a contributor role for the flight, a flight object update request is provided to the FDMP (upstream) to set the coordination dialogue to TRANSFER_INITIATED state. A flight object update, with notification of the TRANSFER_INITIATED state. A flight object update, notifying completion of the transfer (Management of the flight has changed). Description: The transfer operation may only be performed when a coordination dialogue is in the COORDINATED state. It can be initiated either by the upstream (current FDMP) or downstream ATSU. The system performs the following operations: An internal event triggers the system to start the transfer phase with its adjacent ATSU. If the initiating ATSU system is not the FDMP, then it requests the FDMP to set the coordination to the TRANSFER_INITIATED state. The FDMP instance updates the coordination state to the TRANSFER_INITIATED state. Then, it distributes the FO. The receiving ATSU assumes the flight by updating the FO and setting itself as the controlling ATSU and as the FDMP for the flight. Then, it publishes the new FO. See A.2.1.3.6 of ED133
	Element Tagged Value Name	Value	
	megaid		
Element Name		Author	Notes
VerifyIntegrationOfSubmittedChanges		[redacted]	This ability corresponds to the Contributor who receives a flight-object update after

		having submitted some change, for a flight, to the Manager/Publisher. After a parameter time, the proposed changes should become visible in the flight-object. As it is the main part of the FO for an ATC point of view, the following chapter focuses on the updates of the Flight Script. If the change impacts the flight script, the constraints proposed by the Contributor will be present with the indication that the Manager/Publisher has: accepted them (and the trajectory prediction of the Flight-Object now takes them into account); or, has not accepted them (the trajectory prediction ignores them and the flight script is modified to indicate that the constraint has been not accepted). The Manager/Publisher always includes the constraints sent by the Contributors in the flight script. Sometimes, because of its own algorithm, the Manager/Publisher is not able to interpret them the sam way as the Contributor. Thus, it is not able to produce a trajectory prediction that fully reflects the Contributor intentions. In this case, the Manager/Publisher flags these constraints as “Not able to asses” within the flight-script of the flight-object. If the constraint requested by the Contributor can not be used at all, then it is included by the Manager/Publisher in the script and set as “rejected”. <u>Main inputs:</u> Flight-Object update. <u>Main results:</u> The system stops monitoring this response from the Manager/Publisher. <u>Main outputs:</u> Normally none. The capability implies the following activities: The Contributor waits for a predefined time to see if its submitted changes are reflected in the published Flight Object. If the Contributor receives an update before the timer expires: The Contributor looks for the expected changes in the FO. These changes depend on the service requested. If the updated FO does not contain the expected changes, then the Contributor does nothing as the update may be

		intermediate flight-object updates due to changes proposed by another Contributor. If the expected changes are in the script, then the Contributor shall verify that the received script contains all the requested changes as: Accepted, Rejected, or Not able to asses. The new content is used to update the SFPL in accordance with the capability "Acquire information on an incoming flight". If the expected changes were rejected (because the Manager/Publisher found them inconsistent), they remain valid to the Contributor. So, the Contributor keeps these changes in its SFPL and refers the situation as a local supervision responsibility. If the timer expire, the Contributor shall report the problem to an eligible operator (§ FDC locally modifies the flight script.) See ED133 v1.0
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ATCFlightObjectControl4DInterface Definition	[redacted]	Service Interface Definition for i4D trajectory synchronisation.
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ATCFlightObjectControlInterfaceDe finition	[redacted]	ProvidedATCFlightObjectControlInterface Definition interface
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ATCFlightObjectControlIFlightScript InterfaceDefinion	[redacted]	This Interface definition contains the flight script operations
	Element Tagged Value Name	Value
	megaid	
Element Name	Author	Notes
ATCFlightObjectControlServiceLev el	[redacted]	
	Element Tagged Value Name	Value
	forEnvironment	
	megaid	

Table 3: Payload tracing to AIRM

6 Service dynamic behaviour

This chapter is used to describe the interactive behaviour between Services (orchestration) or Service Interfaces (interaction specification). Architectural elements applicable for this description are:

- Service Interaction Specifications
- Service State machines
- Service orchestration

The dynamic behaviour of this service is very simple by itself. In general all operations can be performed without a predefined order.

However, the diagrams below depict a general interaction pattern for all ATC Flight Object Control service operations.

6.1 Service Interface FlightObjectGeneralInterface

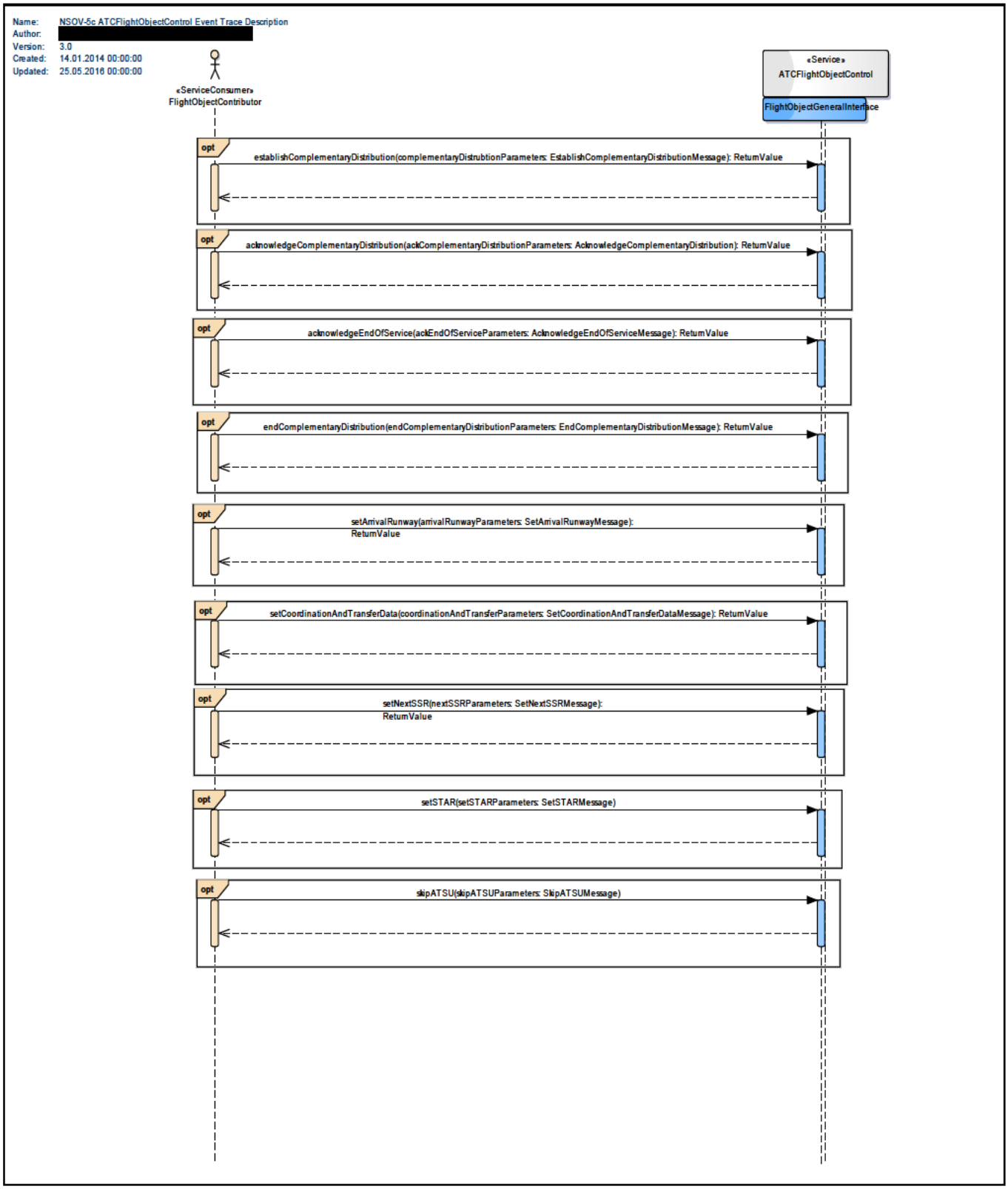

Figure 13: NSOV-5c ATCFlightObjectControl Event Trace Description FlightObjectGeneralInterface

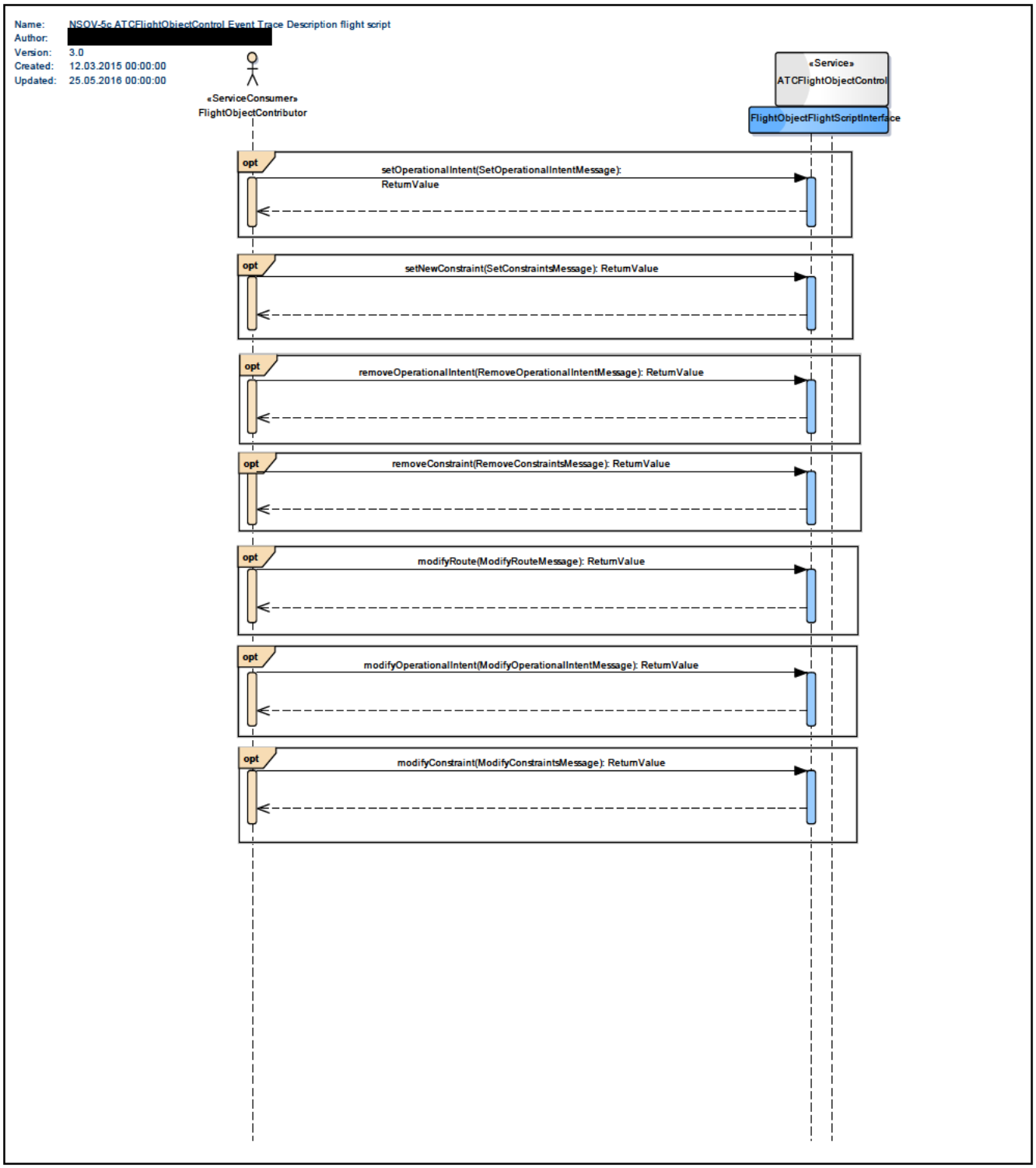

Figure 14: NSOV-5c ATCFlightObjectControl Event Trace Description FlightScript

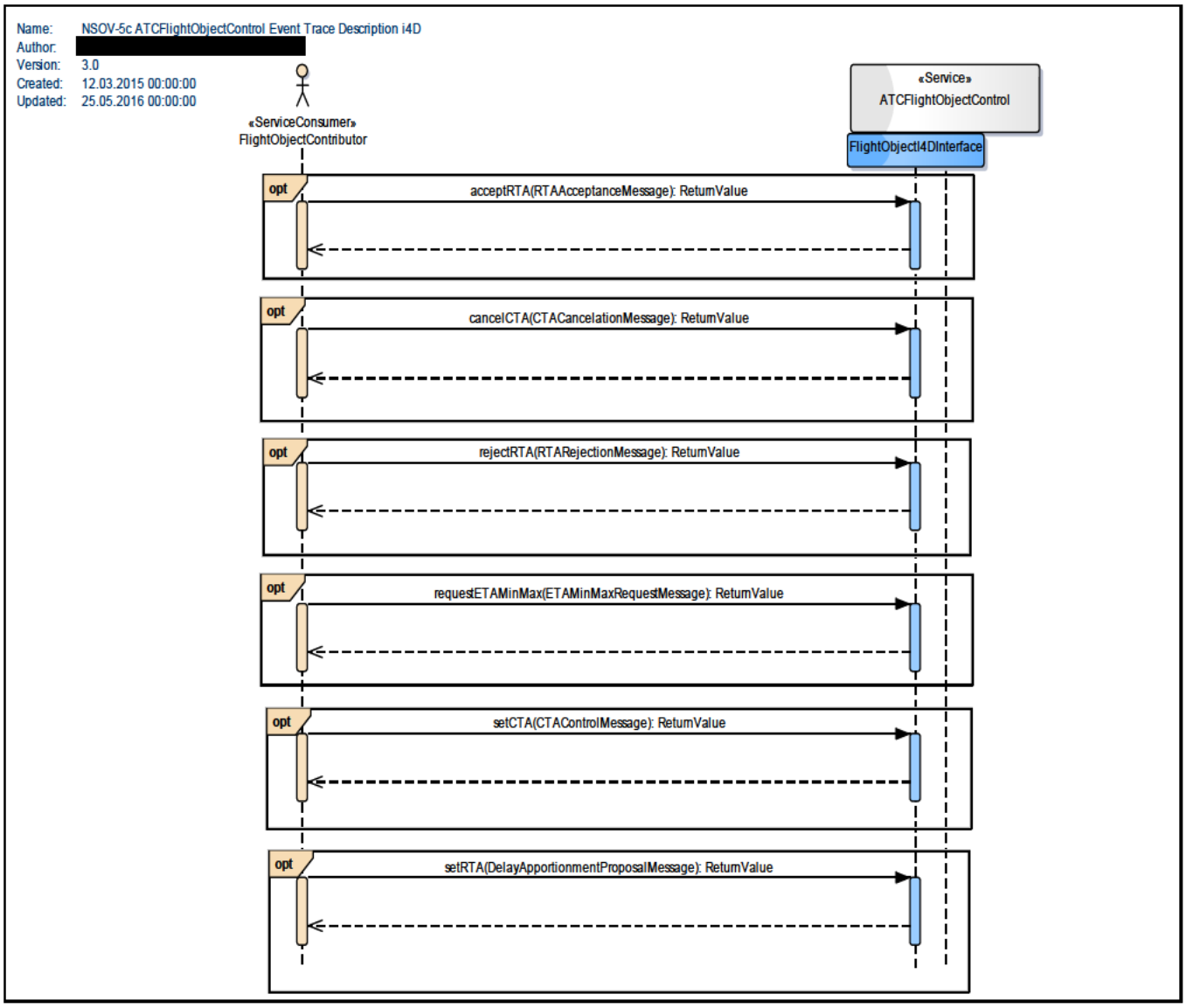

Figure 15: NSOV-5c ATCFlightObjectControl Event Trace Description i4D

7 Service provisioning (optional)

N.A.

8 Validation and Verification

8.1 Verification

Verification was performed relying on the ISRM foundation version 00.07.00.

8.1.1 Verification Results

The details of the verification are shown in the verification report [16].

Service name:	Designed Services - ATCFlightObjectControlService	Date of Service Creation:	20140211-11:50:43
Service version:	3.0	Version of Verification Rules:	00.07.00
Phase:	2.0	Date of Verification:	20160525-04:54:16
Owner of service:	[redacted]	Passes:	500
Name of verifier:		Failures:	
Overall comments:		Manual:	320
MDG Library Functions version:	29915	MDG ISRM Verification version	29993

Figure 16: Verification results

The verification was performed via manual insprection and assisted by a script. The verifification outcome is completely out of errors.
Verification reports are these files:

- Designed_Services_-_ATCFlightObjectControlService.xls
- Designed_Services_-_ATCFlightObjectControlService_Common.xls

8.2 Validation

There are several exercises in which the FlightObject will be validated:

There are 3 validations exercises covering the exchange of information covered by this service and Shared Flight Object:

- **EXE-04.03-VP-711**. Seamless Cross-border Operations. The objective of this exercise was to validate seamless operation among different centres performing coordination and transfer functions, negotiation (with initial What-If e.g. FL, Direct) based on the flight object interoperability and point functionality.
- **EXE-04.03-VP-030**. Ground-ground and air-ground interoperability. It will be validated that the sharing of Trajectory information, including “intent” information of the aircraft, via i4D and IOP, between Controlling ATSU and Destination ATSU in context of the AMAN Extended Horizon concept with a CTA at the IAF will generate performance benefits.

Note: No SWIM Compliance Reports have been provided by those exercises, therefore there is no evidence for a V3 maturity of the service in view.

9 References

Name	Version	Document ID / Location
[1] FAA Web Service Description Document	2008-16-10	http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/atc_comms_services/swim/documentation/media/briefings/WSDD%20FPS%20EXAMPLE%2008-16-10.pdf
[2] NATO Architecture Framework	v3.0 & 3.1	http://www.nhqc3s.nato.int/
[3] SoaML	1.0 Beta 09-04-01	http://www.omg.org/spec/SoaML/
[4] Project deliverables template	03.00.00	SJU templates & guidelines package, Project deliverables template
[5] SESAR Operational Service and Environment Definition	03.00.00	SJU templates & guidelines package, OSED template
[6] SESAR Safety and Performance Requirements	03.00.00	SJU templates & guidelines package, SPR template
[7] IOP OSED & Requirements - Part 1 OSED	00.01.00	04.03 D07
[8] TMF-IOP Technical Note for 2014	01.00.00	04.05 D822
[9] i4D+CTA OSED & Requirements - Part 1 OSED	00.01.00	04.03 D12
[10] IOP+i4D Validation Plan	00.01.00	04.03 D112
[11] ISRM Tooling Guidelines	00.07.00	08.03.10 D44
[12] ISRM Modelling Guidelines	00.07.00	08.03.10 D44
[13] ISRM Foundation Rulebook	00.07.00	08.03.10 D44
[14] ISRM Verification Guidelines	00.07.00	08.03.10 D44
[15] ISRM Service Portfolio	00.08.01	08.03.10 D65
[16] Verification reports for the service	N.A.	08.03.10 D65 Verification reports
[17] ED-133 Specification	June 2009	https://www.eurocae.net/eshop/catalog/advanced_search_result.php?keywords=ED-133
[18] Technical Note for Information Exchanges of OFA 3.1.1 and VP030	00.01.00	08.03.10 Service production, SVA011

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