18.02b-TRL6-INTEROP

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PJ18

PJ18.02B

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Abstract

This document provides operational interoperability requirements for the exchange of flight and trajectory information. These information exchanges are in support of a number of different identified SESAR solutions.

The requirements are structured through a number of high level features each grouping a number of use cases, covering inter-relations between controllers in neighbouring ATC centres.

The requirements describe additional functionalities that are meant to provide more seamless boundaries by providing coordination features similar to the ones existing inside centres and by providing more flexibility in the determination of control responsibility near boundaries.

These requirements also describe the information that must be shared across IOP partners in order to provide an improved situation awareness.

Appendices provide additional requirements related to the integration of NM with ATC IOP partners and requirements labelled "Full IOP" that provide more advanced functions allowing to deliver more IOP benefits.

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The SPR/INTEROP-OSED Template includes the following parts:

- ***SPR/INTEROP-OSED Template – Part I (this volume)***
- SPR/INTEROP-OSED Template – Part II Safety Assessment Report (SAR)
- SPR/INTEROP – OSED Template – Part III Security Assessment Report (SeAR)
- SPR/INTEROP – OSED Template – Part IV Human Performance Assessment Report (HPAR)
- SPR/INTEROP – OSED Template – Part V Performance Assessment Report (PAR)

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1 Executive Summary

The SESAR Technology Solution 18-02b “ATC-ATC Flight Object Interoperability (FO IOP)” is based on a concept to support the sharing of consistent flight data between all ATM stakeholders. Its purpose is to ensure that all ATC systems have a consistent view of the flight, and that the data is widely and easily available, subject to appropriate access controls.

Today in Europe, the initial flight plan data is distributed by NM to all crossed ATS Units a few hours before expected entry time into individual ATSU's area of responsibility. Then each ATS Unit will develop and maintain its own view of the flight, based on a set of local rules and data from the flight plan data. This leads to individual trajectories that are only linked together through synchronization of coordination data by phone or OLDI messages. Obvious drawbacks are absence of updated information before the first OLDI message is received, and the limited scope of what can be passed on through OLDI messages. This results in a poor awareness of the downstream controllers on aircraft manoeuvres before his/her ACC boundary that may impact the trajectory in his/her centre. IOP brings an increased level of synchronization by allowing each stakeholder to share a complete set of data used to build a common end-to-end trajectory, and to exchange controllers’ inputs on each side of IOP Unit boundaries. It also increases controller situation awareness by providing up-to-date data on aircraft flying in the vicinity of his/her airspace even when they will not enter it (notion of Area of Interest).

It is noted that the trajectory information provided through ground/ground “one-to-many” based mechanisms and by the aircraft can support improvements to controller decision support tools, although such details are outside the scope of this specification.

This document describes requirements corresponding to interoperability between ATS units at the level required for the initial deployment.

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Appendices provide other requirements:

- NM-ATC IOP requirements
- “Full IOP” requirements that provide more advanced functions allowing to deliver more IOP benefits.
- Cost and Benefit Mechanism
- Safety Requirements

2 Introduction

2.1 Purpose of the document

This document expresses the operational requirements driving the need for inter-operability between ATC systems. The requirements are to cover the level of IOP that is needed for initial deployment.

2.2 Scope

This document is the INTEROP Document for solution PJ.18-02b (ATC-ATC IOP) and provides high level interoperability requirements for the exchange of flight and trajectory information to support inter-centre coordination and transfer, real-time update and distribution of flight plan changes to all IOP units, control sequence and SSR code management. It also provides Interoperability requirements between NM and ATC in an annex, under the solution PJ.18-02b1.

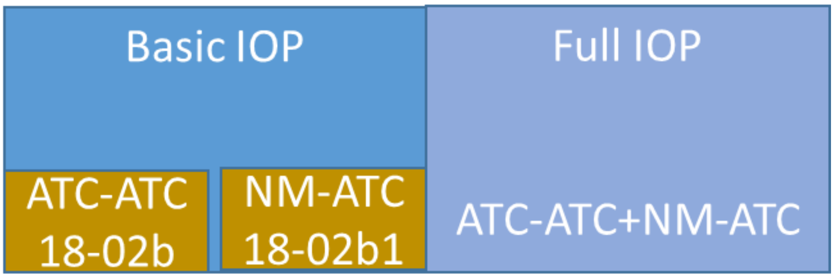


Figure 1: Basic and Full IOP scope

The initial maturity level for solution 18-02b was TRL4, and target maturity is TRL6.

This document defines the functional and non-functional requirements for the handling and sharing of the FO (IOP Application) covering the necessary needs to cover the Basic-IOP ATC-ATC part. More advanced functionalities to get full benefits of IOP, described as being the FULL IOP, as well as NM-ATC IOP requirements, are not in the scope of this document.

BASIC-IOP is defined as followed:

- Fundamental IOP mechanisms allowing exchange of flight objects reflecting the FDP information;
- Inter-centre(s) mechanisms for coordination & negotiation of transfer conditions across FIR boundaries in order to enable silent coordination& transfer;
- Cross border trajectory information sharing through the synchronization of flight script data, enabling seamless operations.
- Increased flexibility in responsibility determination through SKIP and DELEGATE functions
- All necessary failsafe mechanisms to guarantee safe operations
- NM integration in IOP (not in scope of this Solution)

To complement the BASIC IOP, a FULL IOP scope is defined that includes the following elements (note that this list is not exhaustive):

- Inter-centre(s) advance mechanisms for coordination & negotiation of transfer conditions across FIR boundaries including
    - Use of offset,
    - Advanced release,
    - Reclaim,
    - Undo-Assume,
    - Undo-Force-Assume
    - Electronic negotiation of a route modification
- Inclusion in the route description of the approach procedures
- Advanced constraints management: Speed and Rate; Gradient; Time
- Advanced Skip and Delegate
- Exchange of Aircraft Trajectory Data (ADS-C) through FO

Functionalities required to achieve Ground–Ground interoperability have been divided into features. These features provide a functional decomposition that allowed focusing in the subjects that makes the core of the IOP standard. A set of these features was considered necessary to develop the IOP in scope of BASIC IOP. Those features are:

- Feature 1: Coordination & Transfer
- Feature 2: Flight Script management
- Feature 3: IOP Data Distribution
- Feature 4: FO Protocol Failure
- Feature 5: Control Sequence Handling
- Feature 6: FO Recovery
- Feature 8: SSR codes management
- Feature 9: FO/WIFO Mechanism; Transversal technical functionality to support data exchanges in the IOP network.
- Feature 10: Trajectory Management
- Feature 11: TMA
- Feature 12: NM (solution 18-02b1)
- Compared to the last definition of the Common Project definition of Flight Object exchanges, we can use the following mapping:

PCP Feature	Basic IOP Feature
FO Operation, Acknowledge reception	Feature 3
FO Operation, Acknowledge agreement	Feature 3
FO operation, End subscription to FO	Feature 3
FO operation, Subscribe to FO	Feature 3
Modify FO constraints	Feature 2
Modify Route	Feature 2
Set Arrival Runway	Feature 11
Update coordination related information	Feature 1
Modify SSR code	Feature 8
Set STAR	Feature 11
Skip ATSU	Feature 5
Share Flight Object information	Feature 2 & Feature 3

Table 1: Link with PCP feature

2.3 Intended readership

The primary users to which this document is applicable are the PJ18-02b solution members to develop the prototypes and the IBPs that will contribute to technological validation exercises to mature the IOP solution to TRL6.

Other users are the PJ19 members for consistency checking with the rest of SESAR documents. As this document is a key input to the revised ED133 standard on flight object interoperability, it is also intended for WG59 members once approved by the SJU.

After finalization, the main readers of the document are members of WG-59, who will use the document as an input to the revised Ed-133 standard.

2.4 Background

This document was initially developed during SESAR 1 based on requirements documents developed for each IOP feature (refer to the list in 5.1). Then this document has been further developed and re-structured by PJ18-02b operational team (under supervision of the IOP Analysis Team).

2.5 Structure of the document

§1 Provides an Executive Summary

§2 Introduction

§3 Provides a description of the solution, describes the current and the new operating method.

§4 Provides a list of requirements.

§5 Provides a list of reference documents

2.6 Glossary of terms

The following terms are used within this specification.

Term	Definition
BASIC IOP	Identifies the scope of the PJ18-02b solution. Refer to Scope chapter (2.2) for a complete description.
Delegatee	An IOP Unit which is neither Receiving or Transferring RE to the Delegator Unit in control sequence and to whom the control of the flight will be delegated by the Delegator Unit.
Delegator	The first of the two successive IOP Units crossed by the IOP trajectory, who's going to delegate the flight to the Delegatee Unit
En-Route Cruise Level	The level that the flight is to maintain for a significant part of the flight after reaching Top of Climb and prior to Top of Descent, as planned by ATC. The ECL is (in principle) the same as the filed Requested Flight Level (RFL), but it can be changed by ATC (for example, due to conflicting traffic at the cruise level). As per the RFL, whenever there is a planned change to the ECL, it is associated to each point of the affected cruise portion in the planned route. Note also that there may be multiple en-route cruise levels associated to different portions of the route.
Flight Object Partners	Within the context of this document, a Flight Object partner represents an eligible stakeholder whose system fulfils at least one of the FDMP, FDC or FDU roles defined in the Flight Object Interoperability Specification (ED-133).
Flight Script	The set of input data required to calculate the IOP trajectory. It is shared and commonly understood between IOP partners to provide a consistent input to local flight-data-consuming processes. It typically includes the expanded 2D route and any constraints (including operator inputs).
FULL IOP	More advanced functionalities (compared with BASIC IOP) allowing to get full benefits of IOP. Not in scope of PJ.18-02b. Refer to Scope (2.2) chapter for more details.
IOP Trajectory	A common, global predicted 4D trajectory that is calculated using the IOP Flight Script as input data.

Level Constraint	Defines a restriction on the vertical dimension of the trajectory at a specified point on the route. The restriction may result in the vertical profile crossing a defined point (or area) ‘at’, ‘at or below’, ‘at or above’, or ‘between’ specified flight levels.
Letter of Agreement (LOA)	Document that defines the coordination procedures to be applied between two adjacent ATS units. They specify the exchange of flight data between ATC units for the purpose of notification, coordination and transfer or the exchange of information regarding flights for which the responsibility of control does not change
Planned Route	A set of route points describing the horizontal (2D) intent of a flight. It will be revised by both planned and cleared Route Changes i.e. alternative routings that the aircraft is not yet cleared to follow (non-cleared route elements), and changes to the Cleared Route, e.g. when the aircraft is cleared from present position direct to a fix further along its route.
Route Change	A modification to the Planned Route representing a route clearance that has been issued or yet to be issued to the aircraft.
Supplementary Flight Level	A level, at or above which, or at or below which a flight has been coordinated to cross the transfer of control point. The supplementary level, if present, is an element of the exit level.
Speed Constraint	Defines a speed limitation at either a specified point on the route or an altitude. The limitation may be qualified when applied to a point on the route, such that the speed is ‘at’, ‘at or below’, or ‘at or above’. Furthermore, flight phase affects the way the speed restriction is applied before and after the route point. For restrictions at a point in the climb phase, the restriction applies to the aircraft prior to it overflying the point. For restrictions in the descent, the restriction applies to the aircraft after overflying the specified point. Certain speed restrictions are associated with an altitude and not associated with waypoints or procedures. These speed restrictions are intended as speed limits below the specified altitude and apply to a block of airspace or region. For speed restrictions associated with an altitude, the aircraft speed will remain at or below the restriction as long as the aircraft altitude is below the speed restriction altitude.
Standard Instrument Departure (SID)	A designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway direction of the aerodrome with a specified significant point, normally on a designated ATS route.
Standard Arrival Route (STAR)	A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

Standard Conditions	Conditions that are in accordance with the ones specified in Letters of Agreement
Non-Standard Conditions	Conditions that are not in accordance with the ones specified in Letters of Agreement
Time Constraint	Defines a restriction on the time at which the aircraft is expected to cross a specified point on the route with a given accuracy. The restriction may be qualified such that the aircraft should cross the specified point 'at', 'at or before', or 'at or after' the specified time.
Trajectory Constraints	Conditions that may restrict the aircraft from following its desired trajectory. The term is used generically to refer to time, speed or level constraints that can be applied to points on the planned route of the flight (or for some cases at a defined altitude). However, it is noted that specific types of constraints can be further distinguished based upon a number of different factors. For example whether the constraint is defined strategically (prior to flight execution) or tactically (during flight execution); the stakeholders groups that need to be aware of the constraint; and so on. ATM constraints are defined strategically (i.e. prior to execution) through standard ATC procedures, such as SIDs and STARs, and as such are known to aircraft databases. Other types of trajectory constraint that are applicable to this specification include boundary crossing levels defined in LoA between IOP Units, etc., and constraints set through planning processes during flight execution, as set by the planner, MSP, AMAN, local Traffic Manager, etc. There may be trajectory constraints with different operational priorities, dependent upon the source of the constraint. For example, a non-standard coordination defining a level on a coordination point agreed between controllers would supersede any strategically defined level constraint on the coordination point (e.g. as set through LoA).
Trajectory Point	An element of a trajectory that describes the aircraft state at a given time. The minimum information contained within a trajectory point describes its position for the specified time: i.e. identification of the point (e.g. latitude and longitude), the flight level, and the date-time. Note that further attributes may be defined for a trajectory point (e.g. estimated speed, mass, type of point, etc.).
Transfer of Control Point	A point, on the flight path of an aircraft, at which the responsibility for providing ATS to the aircraft is transferred from one ATC unit to the next. Note: The transfer of control point is not necessarily coincident with the coordination point.

Table 2: Glossary of terms

2.7 List of Acronyms

Acronym	Definition
ACC	Area Control Centre
ADEP	Departure Aerodrome
ADES	Destination Aerodrome
ADS-C	Automatic Dependent Surveillance - Contract
AFP	Air Traffic Control Flight Plan Proposal
AFTN	Aeronautical Fixed Telecommunication Network
AIRM	ATM Information Reference Model
AMAN	Arrival Manager
ANSP	Air Navigation Service Provider
AOI	Area Of Interest
AOR	Area Of Responsibility
APP	Approach
ASSR	Assigned SSR Code
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATFCM	Air Traffic Flow and Capacity Management
ATM	Air Traffic Management
ATN	Aeronautical Telecommunication Network
ATOT	Actual Take-Off Time
ATS	Air Traffic Service
ATSU	Air Traffic Service Unit
AU	Airspace User
CAP	Controller Awareness Phase
CDM	Collaborative Decision-Making
CM	Context Management Application
CNS	Communication, Navigation & Surveillance

Acronym	Definition
CFL	Cleared Flight Level
CNS	Communication Navigation and Surveillance
COF	Change Of Frequency
CPDLC	Controller-Pilot Datalink Communications
CSSR	Current SSR
CTA	Calculated Time Of Arrival
CTO	Calculated Time Over
CTOT	Calculated Take-off Time
CWP	Controller Working Position
DPI	Departure Planning Information
DSSR	Downstream SSR Code
EAT	Estimated Approach Time
EATMA	European ATM Architecture
ECL	En-Route Cruise Level
ECS	En-Route Cruise Speed
EFL	Entry Flight Level
ENR	En-route
EOBT	Estimate Off-Block Time
EPP	Extended Projected Profile
E-OCVM	European Operational Concept Validation Methodology
ETA	Estimate Time Of Arrival
ETO	Estimate Time Of Over
ETOT	Estimated Take-Off Time
FANS	Future Air Navigation Systems
FDC	Flight Data Contributor
FDMP	The Flight Data Manager / Publisher
FDP	Flight Data Processor

Acronym	Definition
FDPS	Flight Data Processing System
FDU	Flight Data User
FMP	Flow Management Position
FO	Flight Object
FOC	Flight Operations Centre
GAT	General Air Traffic
HMI	Human Machine Interface
HP	Human Performance
IAP	Initial Approach Point
IBP	Industry-Based Platform
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
INAP	Integrated Network Management and extended ATC Planning
ISRM	Information Services Reference Model
INTEROP	Interoperability Requirements
IOP	Interoperability
KIAS	Knots Indicated Air Speed
KPA	Key Performance Area
LOA	Letter of Agreement
LOF	Log-On Forwarding message (OLDI)
LSSIP	Local Single Sky Implementation
MIL	Military
MSP	Multi-sector planning
MTCD	Medium Term Conflict Detection
NM	Network Management
NP	Negotiation Phase
NSSR	Next Assigned SSR Code

Acronym	Definition
OAT	Operational Air Traffic
OCVM	Operational Concept Validation Methodology
OI	Operational Improvement
OLDI	On-line Data Interchange
ORCAM	Originating Region Code Assignment Method (SSR)
OSED	Operational Service and Environment Definition
RAD	Route Availability Document
RBT	Reference Business Trajectory
RE	Responsible Entity
REQ	Requirement
RFL	Requested Flight Level
ROC	Rate of Climb
ROD	Rate of Descent
ROF	Request Of Frequency
SAP	System Awareness Phase
SBT	Shared Business Trajectory
SESAR	Single European Sky ATM Research Programme
SFL	Supplementary Flight Level
SFPL	System Fight Plan
SI	System Instance
SID	Standard Instrument Departure
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SKIP	SKIP a sector
SPR	Safety and Performance Requirements
SSR	Secondary Surveillance Radar
STAR	Standard Arrival
SWIM	System Wide Information Model

Acronym	Definition
TCP	Transfer of Control Point
TFL	Transfer Flight Level
TMA	Terminal Control Area
TMF	Trajectory Management Framework
TOC	Transfer of Control
TOD	Top Of Descent
TP	Trajectory Prediction
TS	Technical Specification
TTA	Target Time Of arrival
TTG	Time to Go
TTL	Time to Leave
TTO	Target Time Over
UC	Use Case
VFR	Visual Flight Rules
WIMP	What-If Manager / Publisher
XFL	Exit Flight Level
XMAN	Cross-Border Arrival Management

Table 3: List of acronyms

2.8 Limitations

This INTEROP includes ATM interoperability requirements that have been developed under SESAR solution PJ18-02b, for ATC to ATC interoperability (ENR and TMA). The NM requirements tagged as PJ18-02b1 have been drafted and agreed but not validated (Neither with prototype validation nor with expert judgement), and are not considered part of this solution, thus are described in an appendix, for future reference.

3 Operational Service and Environment Definition

3.1 Flight Object Interoperability (FO IOP): a summary

FO-IOP is a concept aimed at achieving a continuum of operations as a flight crosses ATC systems without enforcing uniformity across systems. While seen as a key enabler for Trajectory Based Operations, it remains agnostic to the operational concept, but offers the possibility to share information so that all actors can facilitate the flight in the most efficient way. The concept is distributed but defines for each flight a hierarchy of actors recognizing the prevalence of tactical actions over long term ones in the interest of safety.

In Today's operations, once a flight plan is filed by an Airspace User, the process of this flight plan data is different in every concerned unit. In each of these units, a local flight plan represents the view that the unit maintains on a flight, in order to plan activities first, then to support the control of the flight. Some point to point messages are providing limited synchronization between these local flight plans.

FO-IOP recognizes that there is only one flight and that the short term actions done by an upstream centre may impact long term actions performed by a downstream ones and should be shared, in order to increase collaboration that will enable "the facilitation of the Reference Trajectory".

This is achieved through the notion of a Flight Object that will gather all information and actions related to a Flight. Downstream controllers are then aware in real time of the changes done upstream in order to better prepare their work while upstream controllers are aware of the constraints and changes in the downstream airspace and can maximize the overall flight efficiency.

In the current ATM system, in Europe, the flight plan is filed by the airline operator via the Network Manager. This plan is then distributed to all centres along the expected route of the flight and updated with any changes, routes, delays, cancellations etc. Once the flight is airborne the network is notified that the execution phase has started and the main means of updating the flight is the responsibility of the Air Traffic Service Unit that controls its progression. The Network Manager is still involved receiving updates and when necessary notifying downstream units to changes to the routing or adding, removing units as the actual path of the flight changes and possible restrictions are removed or enforced.

Each unit in the progression is responsible for coordinating the details of the flight with the next unit in the centre sequence. To do this either the telephone is used to verbally coordinate or the Online Data Interchange (OLDI) for electronic coordination. These means provide a snap-shot view of the flight a set time or distance prior to entry in to the next centre, this view can be updated, revised, cancelled, etc. but remains a single static view. OLDI also provides a variety of messages to allow a dialogue, or negotiation, between controllers, messages for civil-military coordination and situational Long Term however although modern Flight Data Processing Systems (FDPS) are capable of exchanging these messages very few actually do so.

The Flight Object in its simplest form can be used to distribute the flight plan when initiated by the Network Manager, holding the flight progression and all known constraints to that flight. Once airborne the successive controlling IOP Unit can update the flight details in real time with all modifications and actions taken in relation to the flight. Downstream centres will receive a continuous stream of information dynamically updating the entry into their area of responsibility and enabling them to request upstream changes to the routing, levels, arrival routes, constraints etc.

The Flight Object also contains a trajectory describing the aircraft path (in 4 dimensions), the basic information needed by the crossed FDPSs to build their own trajectory to suit their needs, information related to the aircraft detail, and so on, for more details regarding the content see the section 3.3.2.3 Content of the Flight Object.

At any given moment, one stakeholder, in normal situations the controlling unit or the next controlling unit, is responsible for collecting and processing all requests to modify the corresponding Flight Object and publish updated information in the form of a new revision of the Flight Object incorporating the requested changes if they were accepted. This stakeholder is called FDMP for Flight Data Manager Publisher. Other stakeholders that are updating data are called FDC for Flight Data Contributor.

3.1.1 Applicable OIs and Enablers

(CR 04971 Update SOL PJ.18-02b_ATC-ATC Flight Object Interoperability (FO IOP) programmatic links PJ20)

Develop Flight Object (FO) interoperability (IOP) between ATC systems (G/G IOP). ATC systems encompasses en-route ATC and TMA ATC. ATC-ATC interoperability will consider seamless coordination, encompassing as well more complex coordination dialogues implying negotiation between controllers across ACC boundaries.

Develop Flight Object (FO) interoperability (IOP) between ATC systems (G/G IOP). ATC systems encompasses en-route ATC and TMA ATC. ATC-ATC interoperability will consider seamless coordination, encompassing as well more complex coordination dialogues implying negotiation between controllers across ACC boundaries.

<table>
<tr><td colspan="2">SESAR Solution ID</td><td colspan="2">Title</td></tr>
<tr><td colspan="2">PJ.18-02b</td><td colspan="2">ATC-ATC Flight Object Interoperability (FO IOP)</td></tr>
<tr><td></td><td>OI code</td><td>Title</td><td>Coverage</td></tr>
<tr><td></td><td>POI-0016-IS</td><td>Basic IOP for G/G data sharing between En-Route ATC centres</td><td></td></tr>
<tr><td></td><td colspan="3">Sharing of consistent flight data (including trajectory) and same view of the flight between all involved en-route ATC units. Including enhanced electronic negotiation features for seamless coordination, transfer and dialogue through instant data sharing.</td></tr>
<tr><td></td><td>EN code</td><td>Title</td><td>Coverage</td></tr>
<tr><td></td><td>ATC-STD-01</td><td>Ground-Ground flight data exchange</td><td>Required/Use</td></tr>
<tr><td></td><td colspan="3">EUROCAE WG 59 Flight object ATSU/ATSU and ATSU/NM: update of ED-133 rev A Flight Object Interoperability Specifications (FOIS) to align with Blue Profile.</td></tr>
<tr><td></td><td>ER ATC 160a</td><td>ATC to ATC Flight Data Exchange for En-Route Basic-IOP using the Flight Object</td><td>Required/Develop</td></tr>
</table>

	Implement ground-ground flight data exchange between En-Route ATC units through the use of Flight Object services based on a revised Flight Object EUROCAE Ed.133 specification, in order to support exchange of flight data at a functional level covering at least all current implementations of the OLDI standard for coordination and transfer. This shall include functionalities supporting negotiation between neighboring units.		
	ER ATC 176	FO Recovery mechanisms and failure scenario	Required/Develop
	Support for loss of IOP nodes full functionality in various configuration, resilience to failure cases and recovery of Flight Object after node failure.		
	SVC-035	Update the Flight Object Services for Basic- IOP with more precise interface definitions	Required/Develop
	Provision of the Flight Object services for Basic-IOP including ATC Flight Object Control and Shared Flight Object service interfaces		
	SWIM-APS-05a	Provision and Consumption of Flight Object Sharing services	Required/Use
	Provision and Consumption of Flight Object Sharing services (In line with AIRM and ISRM) covering: - Flight Object Creation, Distribution, Cancellation, Update and Reception - Airport DPI contribution to the FO Stakeholders involved in FO Sharing - ANSPs Civil and Military, Network Manager, Airport Operators Civil and Military, Airspace Users (FOC and WOC)		
	SWIM-INFR-01a	High Criticality SWIM Services infrastructure Support and Connectivity.	Required/Use
	Provision of the additional functionality needed by the individual Stakeholder to support their SWIM applications in the provision/consumption of High Criticality SWIM Service. This enabler addresses the need for each stakeholder to provide the necessary additional functionality to address the messaging protocol, security, resilience, and other SWIM Profile related aspects for the provision/consumption/ exchanging of these High Criticality types of SWIM Services with other stakeholders, by means of Internet Protocol (IP) connectivity via in-common IP network(s).		
	POI-0050-IS	Basic IOP for G/G data sharing between En-Route and TMA ATC centres	
	Sharing of consistent flight data (including trajectory) and same view of the flight between all involved en-route and TMA ATC units. Including enhanced electronic negotiation features for seamless coordination, transfer and dialogue through instant data sharing.		
	EN code	Title	Coverage
	APP ATC 177	ATC to ATC Flight Data Exchange in a TMA environment	Required/Develop

	Implement ground-ground flight data exchange between ATC units in a TMA environment, through the use of Flight Object services based on a revised Flight Object, in order to support exchange of flight data at a functional level covering at least all current implementations of the OLDI standard for coordination and transfer. This shall include functionalities supporting negotiation between neighboring units.		
	ATC-STD-01	Ground-Ground flight data exchange	Required/
	EUROCAE WG 59 Flight object ATSU/ATSU and ATSU/NM: update of ED-133 rev A Flight Object Interoperability Specifications (FOIS) to align with Blue Profile.		

Table 4: SESAR Solution PJ.18-02b Scope and related OI steps

The following Change Requests are in progress in relation to the Enablers linked to this solution:

Table 5: List of on-going change requests linked to EATMA

EN	Change Request	Description
APP_ATC_177	CR05034	Addition of missing links to EATMA elements according to PJ19 review comments.
ER_ATC_160a	CR05035	Addition of missing links to EATMA elements according to PJ19 review comments.
ER_ATC_176	CR05036	Addition of missing links to EATMA elements according to PJ19 review comments.
SVC-035	CR04758	creation of new EN to Update the Flight Object Services for Basic- IOP with more precise interface definitions.
ATC-STD-01	CR04974	Removal of the link to ED-75 during PJ.18-02b Change date of the standard to October 2021 which is the currently planned date for the delivery of the ED133RevA by EUROCAE WG59. Reference to NM should also be removed as NM is removed from ED133RevA scope. But can remain an enabler to ER APP ATC 162 NM Enabler as it will need the ED133A as a basis.

Id	High Level CONOPS Requirement Description	CONOPS section

Table 6: High Level CONOPS requirements related to SESAR Solution PJ.18-02b

3.2 Detailed Operational Environment

3.2.1 Operational Characteristics

Operational interactions per context (NOV-2)	Operating Environment
[NOV-2] ATS Flight Information Exchange	En-Route; Terminal Airspace;
Comment	

Table 7: Operational Characteristics of ATS Flight Information Exchange

Operational interactions per context (NOV-2)	Operating Environment
[NOV-2] Negotiation between ATS Units	En-Route; Terminal Airspace;
Comment	

Table 8: Operational Characteristics of Negotiation between ATS Units

3.2.2 Roles and Responsibilities

Node	Responsibilities
En-Route/Approach ATS	Performs all the en-route and approach ATS operations. [RELATED ACTORS/ROLES] Executive controller, planning controller, etc.
Flight Deck	Performs all the on-board AU operations including flight execution/monitoring according to agreed trajectory, compliance with ATC clearances/instructions, etc. [RELATED ACTORS/ROLES] Flight Crew

Table 9: Nodes and Responsibilities

Operational interactions per context (NOV-2)		Operating Environment
[NOV-2] ATS Flight Information Exchange		En-Route; Terminal Airspace;
Node	Node instance	Node instance description

En-Route/Approach ATS	Controlling Unit	Coordinates/transfers the flight and disseminates all information about the flight that is in the area of responsibility.
En-Route/Approach ATS	Downstream Unit	Plans the flight that is not yet in the area of responsibility, by monitoring and initiating route and constraint change.
Flight Deck	Flight Deck	Performs all the on-board AU operations including flight execution/monitoring according to agreed trajectory, compliance with ATC clearances/instructions, etc.
En-Route/Approach ATS	Informed Units	Plans the flight that is not yet in the area of responsibility, by monitoring only.
En-Route/Approach ATS	Receiving Unit	Plans and receives the flight that is arriving to the area of responsibility.

Table 10: Operational Interactions of ATS Flight Information Exchange NOV-2 Diagram

Operational interactions per context (NOV-2)		Operating Environment
[NOV-2] Negotiation between ATS Units		En-Route; Terminal Airspace;
Node	Node instance	Node instance description
En-Route/Approach ATS	Controlling Unit	Controls, updates the route and constrains, disseminates all the information for the flight that is in the area of responsibility.
En-Route/Approach ATS	Downstream Unit	Plans the flight that is not yet in the area of responsibility, by monitoring and initiating route and constraint change.
En-Route/Approach ATS	Informed Units	Plan the flight that is not yet in the area of responsibility, by monitoring only.
En-Route/Approach ATS	Negotiating Downstream Unit	Plans the flight that is not yet in the area of responsibility, by monitoring and initiating route and constraint change.

Table 11: Operational Interactions of Negotiation between ATS Units NOV-2 Diagram

3.2.3 Technical Characteristics

Technical constraint	**description**

Table 12: Technical Characteristics

3.2.4 Applicable standards and regulations

Standard Name	Standard Description	Standard Enabler	Comment
Use Case (NOV-5)	[NOV-5] Change Route and Constraints without Negotiation		
Use Case (NOV-5)	[NOV-5] Automatic Triggering and Closure of SAP/CAP/NP in Compliance with LoA		

EUROCAE ED-133A	ATC-ATC flight data exchange updated following validation results	ATC-STD-01	
Use Case (NOV-5)	[NOV-5] Coordination and Transfer Flight		
Use Case (NOV-5)	[NOV-5] Manual Triggering of CAP/NP		
EUROCAE ED-133A	ATC-ATC flight data exchange updated following validation results	ATC-STD-01	
Use Case (NOV-5)	[NOV-5] Change Route and Constraints with Negotiation		

Table 13: Applicable standards and regulations

3.3 Detailed Operating Method

3.3.1 Previous Operating Method

Current operation is assumed to be aligned with the ATM level 3 described in the 2018 LSSIP report, including implementation of all ATC Objectives

During flight execution in today's operation, trajectories are managed by controllers mainly through tactical clearances to ensure a safe, orderly and expeditious flow of traffic. In most cases this involves level changes, vectoring and direct routing. The communication means between controller and pilot to clear and/or change a flight's trajectory is mainly R/T channels and datalink.

Revisions impacting the future evolution of the trajectory, whilst applied locally, are not propagated immediately to the downstream IOP Units. Additionally, some decisions to revise a trajectory are often taken without reference to the wider impact on the trajectory. Such decisions may adversely affect the workload for downstream stakeholders and trigger changes to their planning activities if they are even aware of the change. Usually a downstream ATSU will not know the updated planning until the flight reaches the proximity of the boundary which may affect the stability of its planning processes. Similarly, the lack of reference to network level planning goals creates inefficiencies for the airspace user: pilots may be requested to speed up or route direct in order to expedite the flight, whilst in a downstream sector they are requested to fly at a slower speed or are put in a hold. The flight data exchange required to support notification, coordination and transfer processes are limited to those mandated by European commission implementing regulation 1032/2006 [38].

The planning processes in both the ground and air make extensive use of trajectory predictions. However, not only can the trajectories maintained by different ground units become unsynchronised due to locally applied changes not being shared, but the trajectory used by the aircraft can have significant differences to the ground held plan. These air and ground trajectory predictions often take into account different information, intents and constraints. Aircraft trajectories are assumed to be the most accurate if they were to include all relevant ATC constraints (which they may not have access to) and have up-to-date meteorological information, whereas ATC trajectories today don't have access to some major aircraft characteristics (e.g. mass) and airline preferences (e.g. speed profiles, operating policies), etc. There is limited exchange of information to reconcile any differences.

These intent discrepancies can lead to a number of problems:

- Inaccurate ground trajectory prediction with large uncertainties, this reduces the effectiveness of controller support tools (e.g. for conflict detection or queue management) and hence increases controller workload.

- Inefficiencies (both airspace and environmental) as the flight does not execute its optimised trajectory profile.
- Difference between the controller's expectation of the trajectory and the actual aircraft behaviour – leading to potential safety hazards.

In summary, there are discrepancies in the view of the trajectory held by the different ATM stakeholders and there are limited processes to share information which could reconcile these differences.

3.3.2 New SESAR "FO-IOP Based" Operating Method

3.3.2.1 Use Cases for [NOV-2] ATS Flight Information Exchange

The following diagram (NOV-2, Operational Node Connectivity Description) depicts the information exchanges used between ATS Units to disseminate updates to ATS Flight Information to all concerned Units.

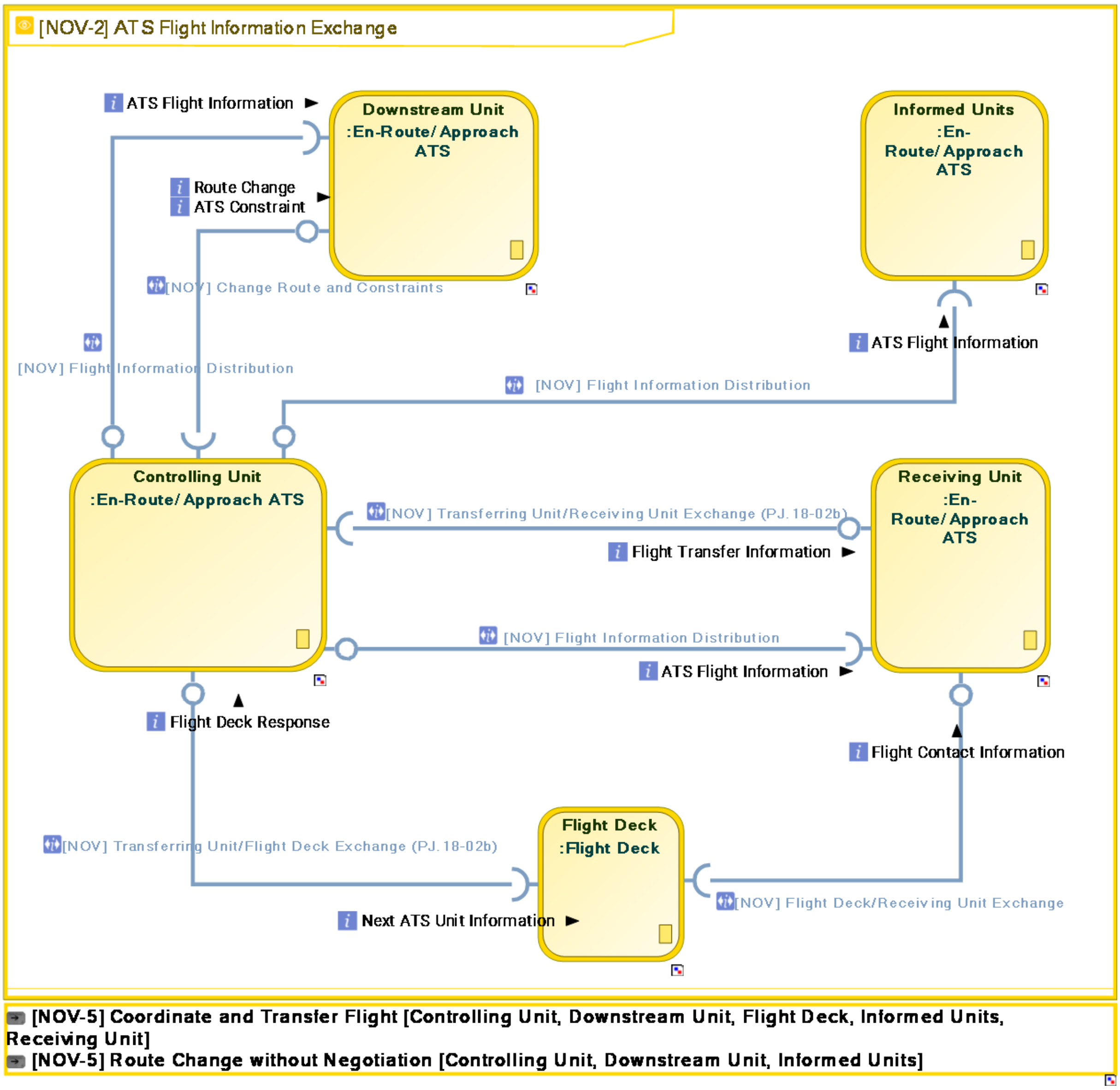


Figure 2: ATC Information Exchange NOV-2 Diagram

3.3.2.1.1 [NOV-5] Coordinate and Transfer Flight

This use case describes the operational activities to transfer a flight from a controlling ATC unit to a receiving ATC unit, including ATS coordination information exchanges among downstream and informed units.

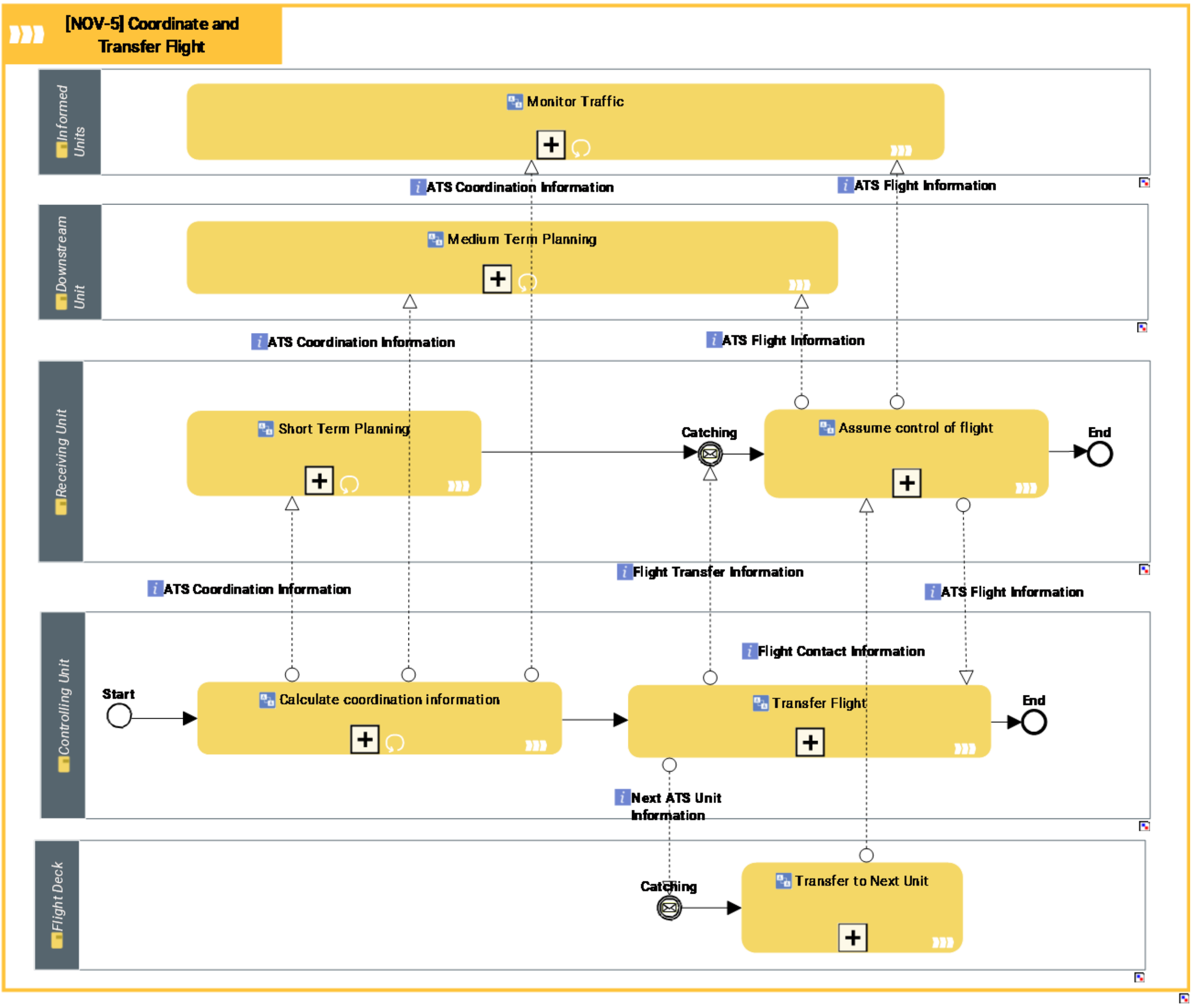


Diagram Id: 335039E55C86743A

Figure 3: Coordinate and Transfer NOV-5 Diagram

Activity	Description
Assume control of flight	'Assume control of a flight' activity starts after a successful 'transfer flight' activity. In a specific moment of the flight, after establishing the communication with the aircraft, 'receiving unit' accepts the control

	responsibility of the flight from the previously controlling unit and assumes the flight. From that moment, the communication and control responsibility of the flight belongs to 'receiving unit'.
Calculate coordination information	ATC systems instantly calculates the flight coordination information. IOP system provides the continuous share of calculated coordination information between the ATC Units.
Medium Term Planning	The medium-term planning term usually used to point out a time horizon which is sufficient to detect the potential conflict between flights and manage capacity-demand balancing in its area of responsibility. Detection of infringement to the restricted airspace(s) can be the subject of medium-term planning term as well.
Monitor Traffic	For any reason, any ATC unit(s) can consider that a flight might be potentially relevant to his sector and monitoring might be needed. Even if any further downstream unit which is not in the control sequence can subscribe to the distribution list and retrieve the information related to the evaluation of the flight In the IOP system, any further downstream ATC unit(s) that are not in the control sequence might be informed accordingly about the evaluation of the flight.
Short Term Planning	The short-term planning term usually used to point out a time horizon which is sufficient to detect the most probable conflict between flights in its area of responsibility. Management of capacity-demand balancing is not a part of short-term planning activities. Detection of infringement to the restricted airspace(s) still can be the subject of short-term planning activities as well.
Transfer Flight	Transfer of a flight term is used to define “transfer of responsibility for providing air traffic control service”. In a specific moment of the flight, while the ‘controlling ATC unit’ retains the communication and control responsibility of the aircraft, the aircraft be instructed to communicate with the next (receiving) ATC unit. Whereby that action, the responsibility for the separation of an aircraft is transferred from one controller to another.
Transfer to Next Unit	Flight deck receives an instruction to communicate with the next ATC unit from the current controlling ATC unit. The flight deck executes the instruction, and the communication is established with the (next) 'receiving ATC unit'. The receiving ATC unit confirms that the communication and control responsibility of the flight belongs to themselves. After that moment, it should be understood that the 'transfer to next unit' process is finished successfully.

Table 14: Activity Descriptions for Coordinate and Transfer NOV-5 Diagram

Issuer	Info Exchange	Addressee	Info Element	Info Entity
Controlling Unit	Calculate coordination information o--> Short Term Planning	Receiving Unit	ATS Coordination Information	CoordinationAndTransfer

Issuer	Info Exchange	Addressee	Info Element	Info Entity
Receiving Unit	Assume control of flight o--> Monitor Traffic	Informed Units	ATS Flight Information	FlightDataInformation
Controlling Unit	Calculate coordination information o--> Monitor Traffic	Informed Units	ATS Coordination Information	CoordinationAndTransfer
Controlling Unit	Transfer Flight o--> Catching	Receiving Unit	Flight Transfer Information	CoordinationAndTransfer
Controlling Unit	Transfer Flight o--> Catching	Flight Deck	Next ATS Unit Information	ContactInformation
Controlling Unit	Calculate coordination information o--> Medium Term Planning	Downstream Unit	ATS Coordination Information	CoordinationAndTransfer
Flight Deck	Transfer to Next Unit o--> Assume control of flight	Receiving Unit	Flight Contact Information	AircraftCallsign
Receiving Unit	Assume control of flight o--> Medium Term Planning	Downstream Unit	ATS Flight Information	FlightDataInformation
Receiving Unit	Assume control of flight o--> Transfer Flight	Controlling Unit	ATS Flight Information	FlightDataInformation

Table 15: Operational steps for Coordinate and Transfer NOV-5 Diagram

3.3.2.1.2 [NOV-5] Route Change without Negotiation

This use case describes the operational activities to make a route change impacting downstream sector(s) without negotiation and sharing this route change information among the concerned units.

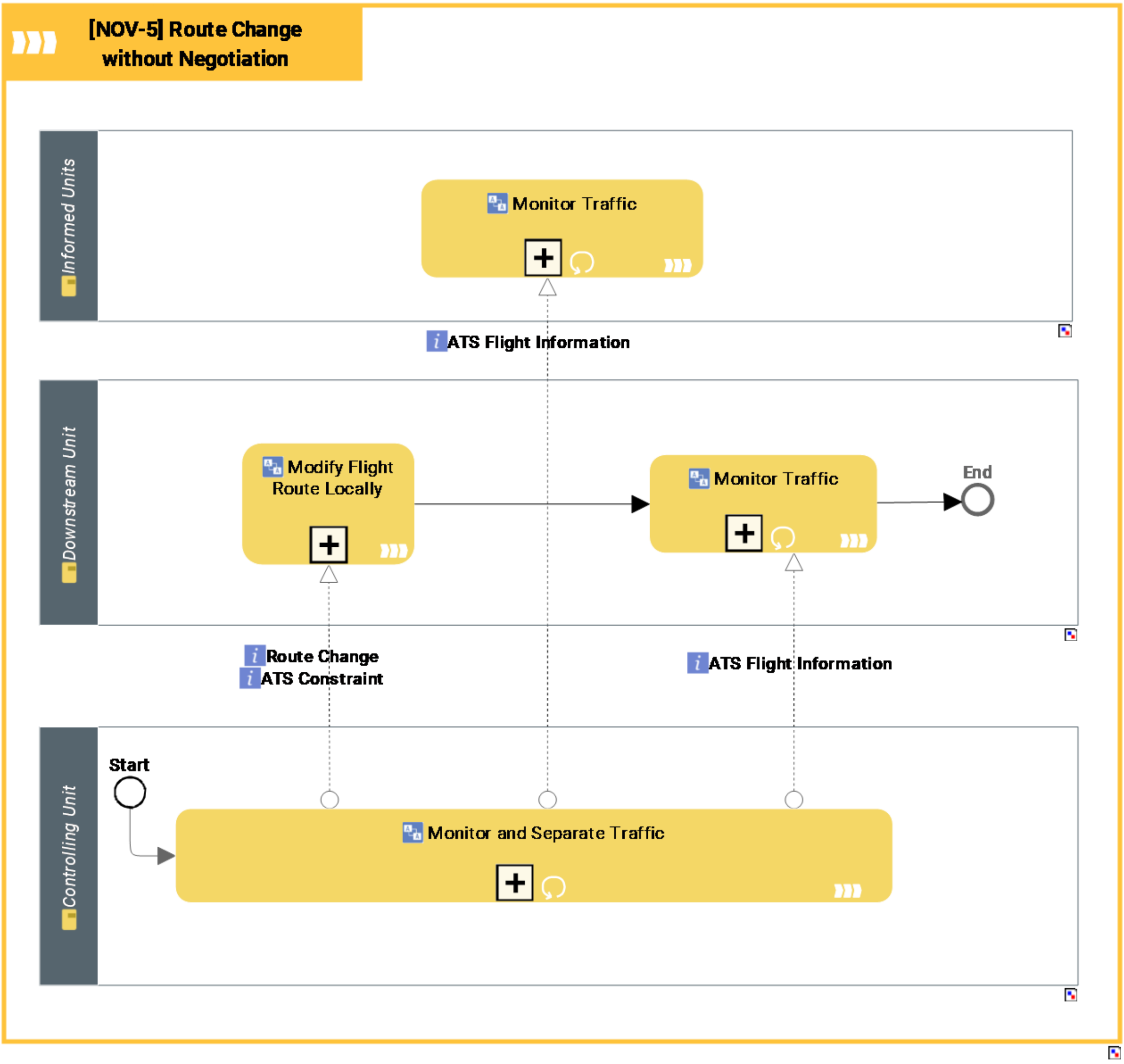


Diagram Id: 5BB578585C86302A

Figure 4: Route Change without Negotiation NOV-5 Diagram

Activity	Description
Modify Flight Route Locally	Update the flight route to reflect the unit's decision.
Monitor and Separate Traffic	This corresponds to the tasks of controllers to provide separation corresponding to the individual phases of flight.
Monitor Traffic	For any reason, any ATC unit(s) can consider that a flight might be potentially relevant to his sector and monitoring might be needed. Even if any further downstream unit which is not in the control sequence can subscribe to the distribution list and retrieve the information related to the evaluation of the flight In the IOP system, any further downstream ATC unit(s) that are not in the control sequence might be informed accordingly about the evaluation of the flight.

Table 16: Activity Descriptions of Route Change without Negotiation NOV-5 Diagram

Issuer	Info Exchange	Addressee	Info Element	Info Entity
Controlling Unit	Monitor and Separate Traffic o--> Modify Flight Route Locally	Downstream Unit	ATS Constraint	ATMTrajectoryConstraint
Controlling Unit	Monitor and Separate Traffic o--> Modify Flight Route Locally	Downstream Unit	Route Change	RouteChange
Controlling Unit	Monitor and Separate Traffic o--> Monitor Traffic	Downstream Unit	ATS Flight Information	FlightDataInformation
Controlling Unit	Monitor and Separate Traffic o--> Monitor Traffic	Informed Units	ATS Flight Information	FlightDataInformation

Table 17: Operational steps of Route Change without Negotiation NOV-5 Diagram

3.3.2.2 Use Cases for [NOV-2] Negotiation between ATS Units

The following diagram (NOV-2, Operational Node Connectivity Description) consolidates the information exchanges used in during negotiation use cases.

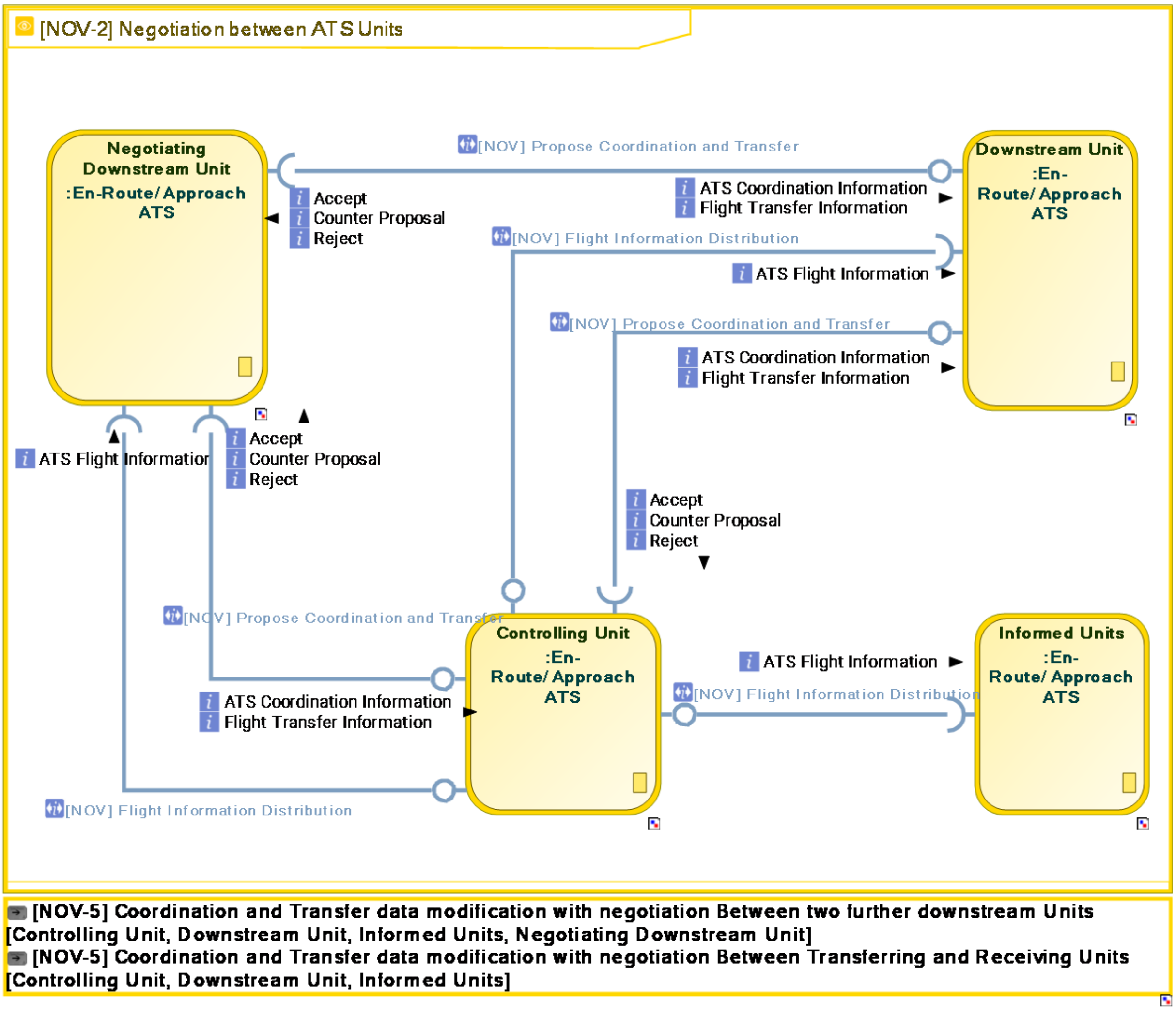


Figure 5: Negotiation Between ATS Units NOV-2 Diagram

Use case	[NOV-5] Coordination and Transfer data modification with negotiation Between Transferring and Receiving Units
Use case	[NOV-5] Coordination and Transfer data modification with negotiation Between two further downstream Units

3.3.2.2.1 [NOV-5] Coordination and Transfer data modification with negotiation Between Transferring and Receiving Units

The coordination and the transfer conditions between two successive IOP Units of the control sequence must rely on pieces of information called C&T data (Coordination & Transfer data). Their modification might be the subject of a negotiation. C&T data is consist of TFL, SFL, Heading, Direct, Speed, RoC/RoD.

This use case describes the operational activities to make a negotiation between Transferring Unit and Receiving unit and sharing the result of this negotiation among the concerned units.

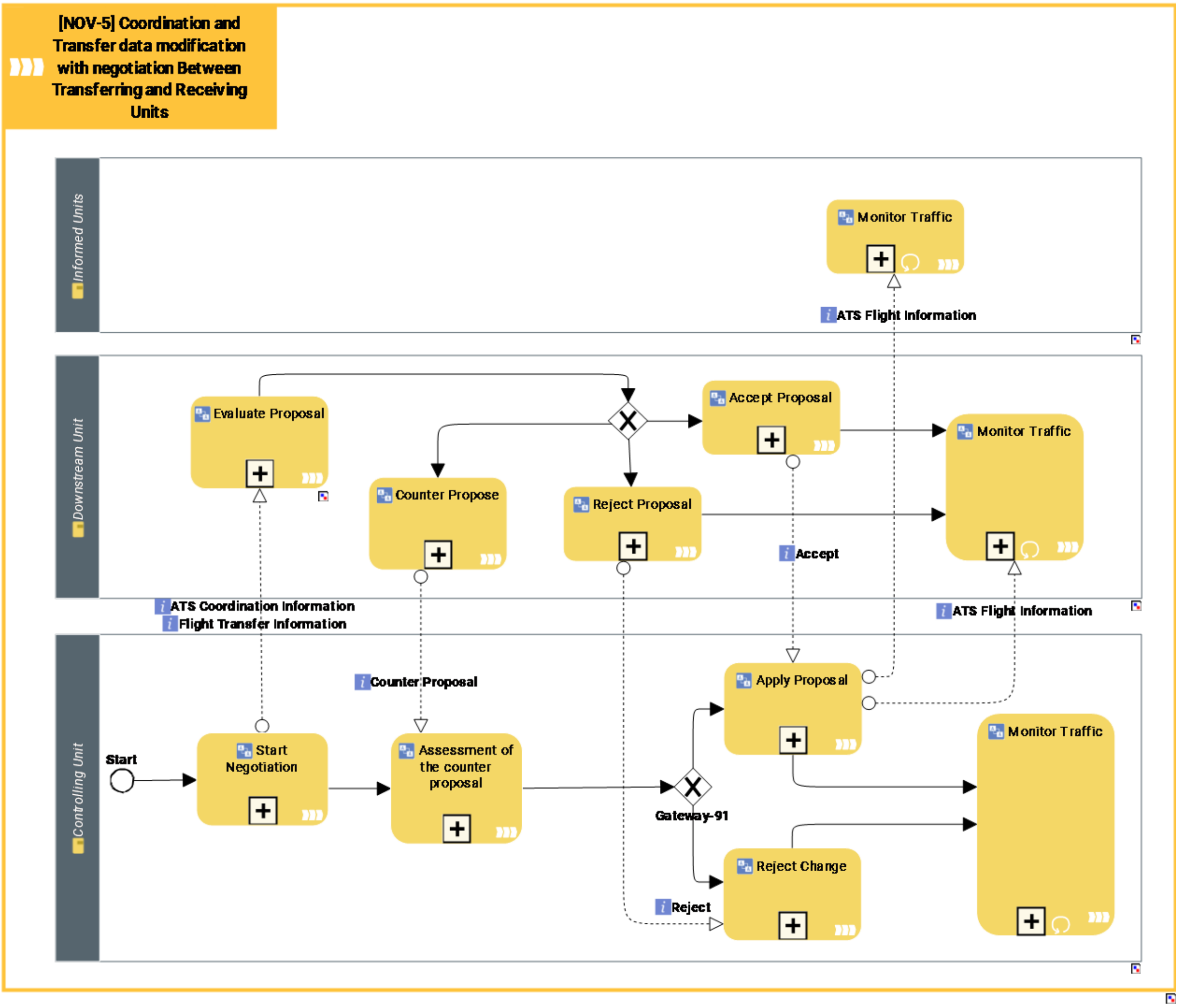


Diagram Id: 47E250155DEA2B2A

Figure 6: Coordination and Transfer Data Modification with Negotiation between Transferring and Receiving Units NOV-5 Diagram

Activity	Description
Monitor and Separate Traffic	The service provided for the purpose of preventing collisions between aircraft and expediting and maintaining an orderly flow of air traffic.
Accept Proposal	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. After the assessment, the controllers decide the change is proper and accept the proposal. The initiator ATC unit (where the proposal was received from) is informed.
Apply Proposal	After receiving 'the change proposal is proper and acceptable' information from the receiver unit, initiator unit apply the changes to their local ATC system and deliver clearance to the flight deck. Thanks to the IOP system, this information is shared and available for further downstream ATC units (informed units) as well.

Assessment of the counter proposal	After receiving a counter proposal from the receiver unit, the impact of the counter proposal is assessed by the initiator ATC unit. The controllers decide whether accept or reject the counter proposal.
Counter Propose	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. After the assessment, the controllers decide the change is NOT proper under these circumstances and propose a new change that is proper for themselves. The initiator ATC unit (where the proposal was received from) is informed about the new proposal.
Evaluate Proposal	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. Either by system support or visual scan, the controllers decide whether to counter propose, accept or reject the proposal.
Monitor Traffic	For any reason, any ATC unit(s) can consider that a flight might be potentially relevant to his sector and monitoring might be needed. Even if any further downstream unit which is not in the control sequence can subscribe to the distribution list and retrieve the information related to the evaluation of the flight In the IOP system, any further downstream ATC unit(s) that are not in the control sequence might be informed accordingly about the evaluation of the flight.
Reject Change	After receiving 'the change proposal is NOT proper and NOT acceptable' information from the receiver unit, controllers working in initiator unit acknowledge the information on their local ATC system. The negotiation process stops. There is no need to deliver a clearance (or information) to the flight deck.
Reject Proposal	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. After the assessment, the controllers working in the receiver unit decide the change is NOT proper and reject the proposal.
Start Negotiation	Prepare a proposal of coordination and transfer or of any other negotiable change start negotiating with the concerned unit.

Table 18: Activity Description of Coordination and Transfer Data Modification with Negotiation between Transferring and Receiving Units NOV-5 Diagram

Issuer	Info Exchange	Addressee	Info Element	Info Entity
Controlling Unit	Start Negotiation o--> Evaluate Proposal	Downstream Unit	Flight Transfer Information	CoordinationAndTransfer
Controlling Unit	Start Negotiation o--> Evaluate Proposal	Downstream Unit	ATS Coordination Information	CoordinationAndTransfer
Downstream Unit	Counter Propose o--> Assessment of the counter proposal	Controlling Unit	Counter Proposal	WIFOCounterProposal
Downstream Unit	Reject Proposal o--> Reject Change	Controlling Unit	Reject	WIFORejection

Issuer	Info Exchange	Addressee	Info Element	Info Entity
Downstream Unit	Accept Proposal o--> Apply Proposal	Controlling Unit	Accept	WIFOAcceptance
Controlling Unit	Apply Proposal o--> Monitor Traffic	Informed Units	ATS Flight Information	FlightDataInformation
Controlling Unit	Apply Proposal o--> Monitor Traffic	Downstream Unit	ATS Flight Information	FlightDataInformation

Table 19: Operational Steps of Coordination and Transfer Data Modification with Negotiation between Transferring and Receiving Units NOV-5 Diagram

3.3.2.2.2 [NOV-5] Coordination and Transfer data modification with negotiation Between two further downstream Units

The coordination and the transfer conditions between two successive IOP Units of the control sequence must rely on pieces of information called C&T data (Coordination & Transfer data). Their modification might be the subject of a negotiation. C&T data is consist of TFL, SFL, Heading, Direct, Speed, RoC/RoD.

This use case describes the operational activities to make a negotiation between two further downstream units while none of them has the control of the flight and sharing the result of this negotiation among the concerned units.

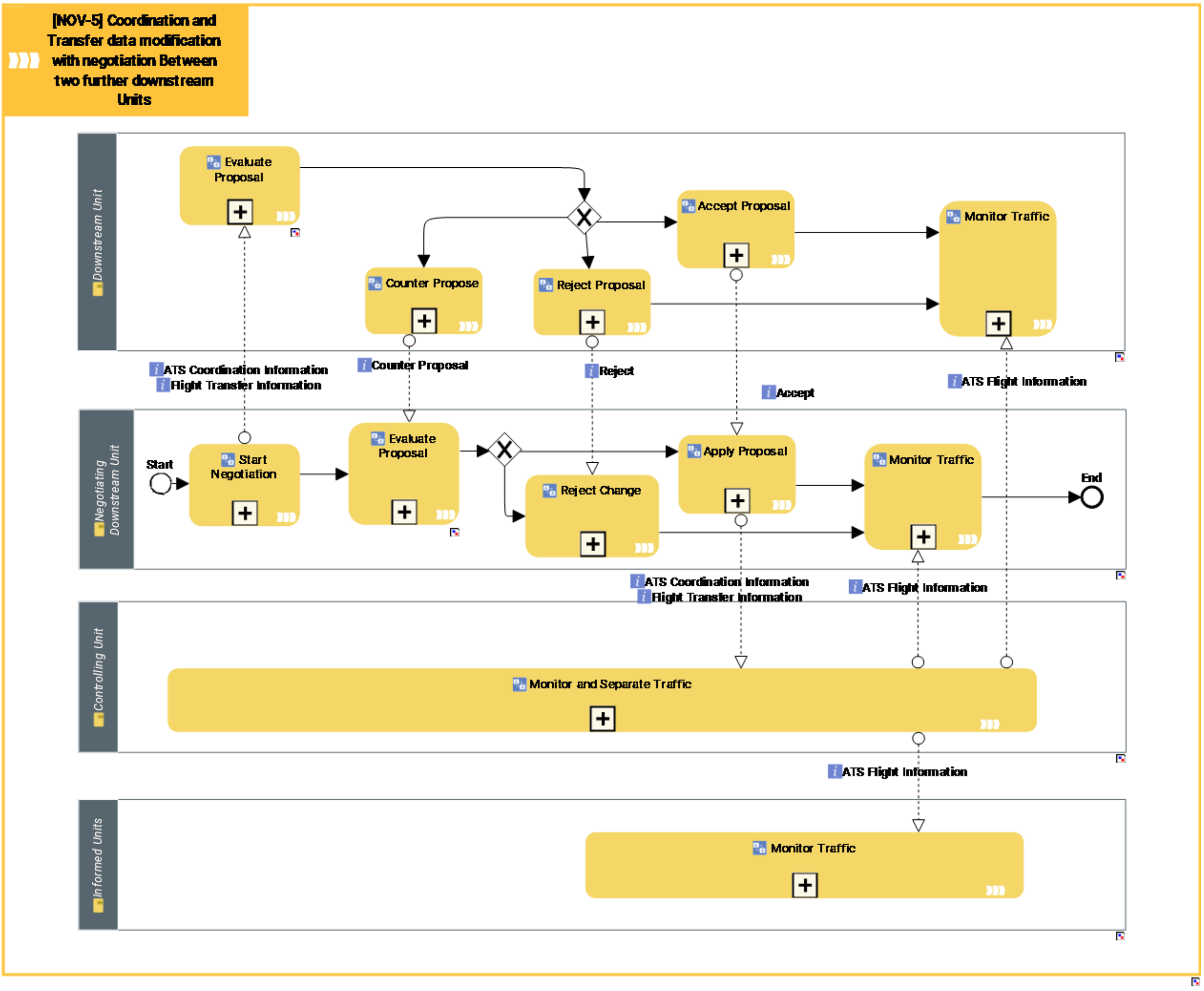


Diagram Id: 7C87830A5C8741E2

Figure 7: Coordination and Transfer data modification with negotiation between two further downstream Units NOV-5 Diagram

Activity	Description
Monitor and Separate Traffic	The service provided for the purpose of preventing collisions between aircraft and expediting and maintaining an orderly flow of air traffic.
Accept Proposal	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. After the assessment, the controllers decide the change is proper and accept the proposal. The initiator ATC unit (where the proposal was received from) is informed.
Apply Proposal	After receiving 'the change proposal is proper and acceptable' information from the receiver unit, initiator unit apply the changes to their local ATC system and deliver clearance to the flight deck. Thanks to the IOP system, this information is shared and available for further downstream ATC units (informed units) as well.
Counter Propose	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. After the assessment, the controllers decide the change is NOT proper under these circumstances and propose a new change that is proper for themselves. The initiator ATC unit

	(where the proposal was received from) is informed about the new proposal.
Evaluate Proposal	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. Either by system support or visual scan, the controllers decide whether to counter propose, accept or reject the proposal.
Monitor Traffic	For any reason, any ATC unit(s) can consider that a flight might be potentially relevant to his sector and monitoring might be needed. Even if any further downstream unit which is not in the control sequence can subscribe to the distribution list and retrieve the information related to the evaluation of the flight In the IOP system, any further downstream ATC unit(s) that are not in the control sequence might be informed accordingly about the evaluation of the flight.
Reject Change	After receiving 'the change proposal is NOT proper and NOT acceptable' information from the receiver unit, controllers working in initiator unit acknowledge the information on their local ATC system. The negotiation process stops. There is no need to deliver a clearance (or information) to the flight deck.
Reject Proposal	After receiving a change proposal, the impact of the change is assessed by the receiver ATC unit. After the assessment, the controllers working in the receiver unit decide the change is NOT proper and reject the proposal.
Start Negotiation	Prepare a proposal of coordination and transfer or of any other negotiable change start negotiating with the concerned unit.

Table 20: Activity Description of Coordination and Transfer data modification with negotiation between two further downstream Units NOV-5 Diagram

Issuer	Info Exchange	Addressee	Info Element	Info Entity
Controlling Unit	Monitor and Separate Traffic o--> Monitor Traffic	Informed Units	ATS Flight Information	FlightDataInformation
Downstream Unit	Reject Proposal o--> Reject Change	Negotiating Downstream Unit	Reject	WIFORejection
Negotiating Downstream Unit	Start Negotiation o--> Evaluate Proposal	Downstream Unit	Flight Transfer Information	CoordinationAndTransfer
Negotiating Downstream Unit	Start Negotiation o--> Evaluate Proposal	Downstream Unit	ATS Coordination Information	CoordinationAndTransfer
Downstream Unit	Counter Propose o--> Evaluate Proposal	Negotiating Downstream Unit	Counter Proposal	WIFOCounterProposal
Controlling Unit	Monitor and Separate Traffic o--> Monitor Traffic	Negotiating Downstream Unit	ATS Flight Information	FlightDataInformation

Issuer	Info Exchange	Addressee	Info Element	Info Entity
Downstream Unit	Accept Proposal o--> Apply Proposal	Negotiating Downstream Unit	Accept	WIFOAcceptance
Negotiating Downstream Unit	Apply Proposal o--> Monitor and Separate Traffic	Controlling Unit	Flight Transfer Information	CoordinationAndTransfer
Negotiating Downstream Unit	Apply Proposal o--> Monitor and Separate Traffic	Controlling Unit	ATS Coordination Information	CoordinationAndTransfer
Controlling Unit	Monitor and Separate Traffic o--> Monitor Traffic	Downstream Unit	ATS Flight Information	FlightDataInformation

Table 21: Operational Steps of Coordination and Transfer data modification with negotiation between two further downstream Units NOV-5 Diagram

3.3.2.3 Content of the Flight Object

The Flight Object is a collection of items that are shared between the various users, see section: 3.2.2Roles and Responsibilities. The local user may use an internal set of information in parallel to the FO and use the FO to complement this set or, they may use the information provided directly.

As an example: the FO contains a trajectory calculated by the current controlling IOP Unit and it also contains all the elements (flight plan, restrictions, STAR, etc.) that can be used to build a trajectory. The local user may elect to make use of the FO trajectory directly in its system or it may build its own trajectory based on the data supplied. Both of these choices are valid and it must be recognised that each version of the trajectory will be slightly different – there is not one trajectory algorithm used within the IOP area. The trajectories built and distributed will vary slightly as each IOP Unit subsequently takes over the responsibility and each IOP Unit that creates its own local version will apply rules and internal events that are not relevant to the wider community. In this way freedom of choice and ability to adapt to local conditions is ensured, checking routines that will be described later must take this in to account.

The flight Object is structured around a number of clusters as shown on the figure below:

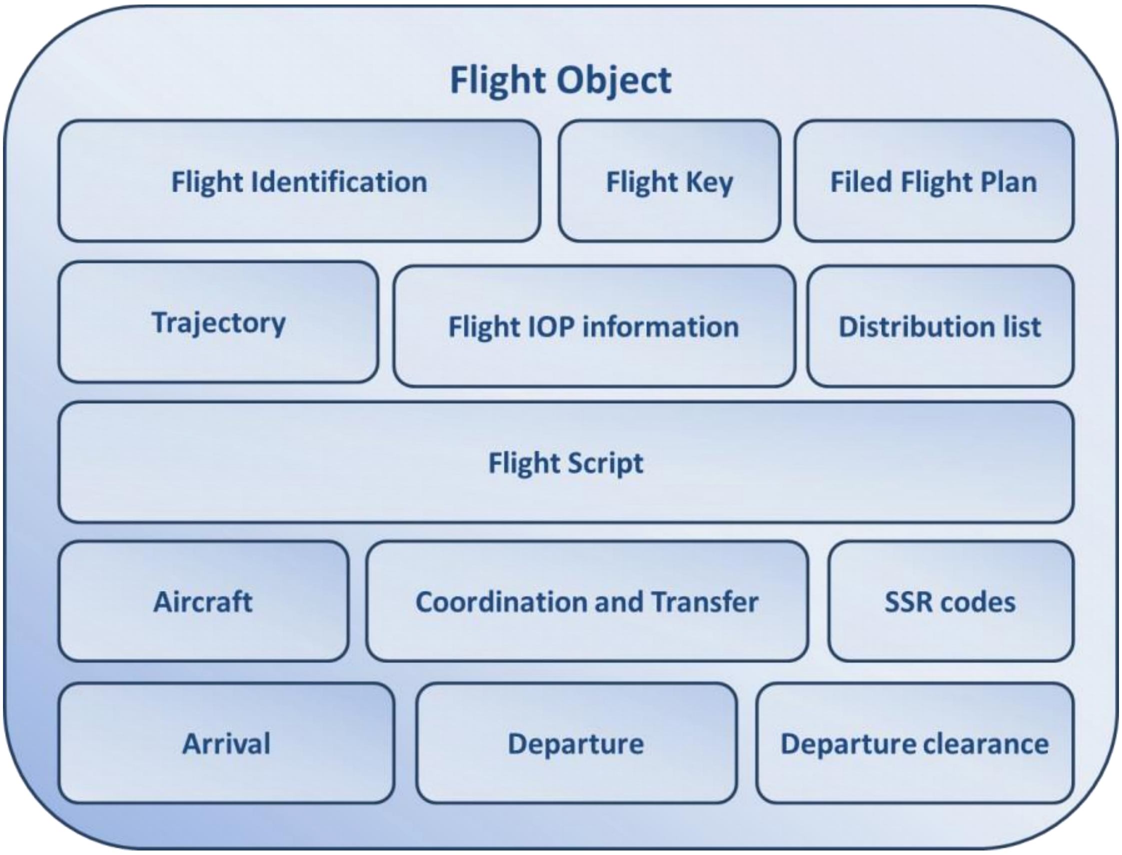


Figure 8: FO Illustration

This structure can evolve in future implementation, for instance a dedicated cluster might be added in the future to store ADS-C information including the Extended Projected Profile (EPP).

3.3.2.3.1 The Initial Plan

The first IOP unit to be responsible for the flight will compute a trajectory over the whole IOP area that it will use to determine which are the relevant units where the Flight Object must be distributed. Other units may provide corrections to this trajectory or the distribution based on their local knowledge.

3.3.2.3.2 Constraints

Constraints are limitations or restrictions applied to a flight in order to ensure an optimum flight path given capacity balancing, sector workload, departure and arrival procedures, environmental conditions etc. Ideally no constraints other than those requested by the airline operator would be applied, the requested flight levels (RFL), speeds, times and the 2D routing, but the ATM world is not ideal and some restrictions have to be imposed.

3.3.2.3.3 IOP Units Sequence

Each of the above actions, the expansion of the route and the addition of the constraints, has an impact either on the IOP Units to which the flight object is distributed or that will control the flight.

These IOP Units consist of the units,

- That will be crossed by the flight (through its Area of Responsibility);
- IOP Units who will actually control the flight, and
- Additional IOP Units to whom the information is distributed.

The initial sequence will be built from the expansion of the flight plan route and impacted by the constraints added by each IOP Unit. The sequence can be modified by SKIP or Delegate Functions.

Initially the flight object will be distributed to all IOP Units who will be crossed by the flight on the assumption that these are the IOP Units who will control the flight. Each downstream IOP Unit, through constraints, corrections or automatic actions will amend this list and provide the IOP Units who will actually control the flight. In addition they may distribute the FO to other IOP Units who have expressed an interest in receiving the information on, for example, flights crossing their Area of Interest.

3.3.2.4 Defined Roles in the IOP Concept

Several roles are defined to manage the FO. These roles change with the control status of the IOP Unit and the relationship of other units to the control unit or as the originator of a message.

The roles defined for the FO are therefore dynamic, those related to the aeronautical information are statically associated to each piece of information.

The roles are as follows:

- The Flight Data Manager / Publisher (FDMP). A system fulfilling the FDMP role is responsible for maintaining the consistency of the FO and distributing the FO to the other FDPSs that need it. It receives requests to update the FO from the Flight Data Contributors and does the necessary processing to ensure a coherent and consistent FO covering the whole IOP Area is maintained and published to all subscribers. The system which fulfils the FDMP role is the system which is currently operationally responsible for the flight, and changes as the flight progresses, or it is the first enabled IOP Unit to have the flight under operational control.

- The Flight Data Contributor (FDC). A system fulfilling the FDC role may request changes to parts of the FO, for example to set a constraint. These requests are processed by the FDMP and the resulting consistent FO is distributed. All systems whose airspace will be penetrated by a flight in the future are considered contributors for that flight.

- The Flight Data User (FDU). Receives FOs and associated updates from the FDMP. A FDU is not allowed to request changes to the FO.

- The What-If Manager / Publisher (WIMP). A “what-if FO” (WIFO) is a special kind of FO. It is essentially a copy of the real FO and is used to negotiate potential changes to the flight data without affecting the corresponding data for the actual flight. A system that plays the WIMP role is responsible for publishing a WIFO, for managing the responses from the What-If Contributors and for requesting any consequent changes to the real FO.

- The What-If Contributor (WIC). A WIC responds to the proposals made by the WIMP.

3.3.2.5 Use of the FO

3.3.2.5.1 Trajectory Update Phases

The first Flight Object is created by the IOP unit that will be crossed the first by the flight (Under nominal conditions)

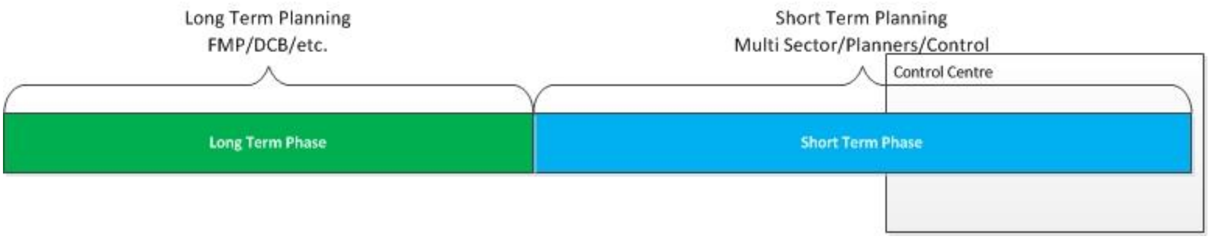


Figure 9: Trajectory Update Phases

The way the trajectory is built using the data in the FO is based on the relation to the boundary of a control centre and the level of interest that centre has in its content and impact on operations. It is built of two phases beginning with a Long Term phase where data is available and a Short Term phase where changes to the data have a more tactical impact.

In this concept the Long Term phase is when the trajectory is being used for flow, capacity type evaluations.

The Short Term phase is when the movement of the flight becomes more tactically relevant and there is a move from a flow, capacity level of planning to a sector, or multi sector level to the control by the centre.

Note that the terms “Long” and “Short” are used here for descriptive purposes only; they are used to indicate that if an IOP Unit chooses they may use the FO in different ways depending on the proximity to the centre.

In these phases the FO is available and the Centre can choose which elements to make use of or delay the use until a later phase. This is a local decision however the general principle laid down here is expected to be used in the majority of cases.

3.3.2.5.1.1 Long term

This can begin as soon as the FO is available and is being distributed. Before this point data from the Network Manager can be used and for any Centre tools during this phase will make use of trajectories from the NM, ones built by the FO and local trajectories.

In this phase the Flight Object may be available but may not be synchronized with local flight plan data and can only be used by the flow management or advanced planning functions. If we bear in mind that a local FDPS may have a limited processing, memory and adaptation data possibility or may not want to create internal plans for all the flights that will cross their airspace in the hours to come and will wait until the flights are closer and more relevant, the expected use in this phase will be of the IOP trajectory built and distributed by the current, controlling, IOP Unit.

At each new reception the new trajectory will be re-evaluated for changes as they occur in the progression of the flight and where necessary constraints added, removed or modified.

The second possibility will be for the downstream IOP Units to make use of the Flight Script and either with their local FDPS, or with a separate trajectory calculation tool build their own local version of the trajectory and use the process as described above to inform the current IOP Unit of changes as they are needed.

During this phase the trajectories are used to calculate expected sector demand, bunching, busy flows etc. and to start to add constraints and request potential re-routings or level restrictions to off load. Where standard restrictions are known, e.g. an exit level restriction forcing a descent to a particular airport, these can be applied and added to the trajectory, known changes to airspace restrictions can be provided updating the trajectory and providing the downstream units earlier and more accurate planning information.

Within this phase at a local level there may be planned restrictions, e.g. for a particular unit using the segment of the flight for sector load calculations, but they may decide not to add these restrictions until a certain time prior to the boundary in order to allow the traffic to mature and not enforce constraints until certain they will be required.

Similarly arrival information such as the STAR and runway may be tentatively available and could be used to update the TP however it may be decided to wait until near the destination to update this information.

3.3.2.5.1.2 Short Term

During this phase as the flight is closer to the Centre it is expected that the Flight Script will be used.

The IOP trajectory, while built from the information contained in the Flight Script, will always be slightly different from the locally constructed version. Due to the proximity of the flight it is felt better to build all the trajectories from, as far as possible, the same system. So in this phase the Flight Script is used by the local FDPS to build all trajectories in the same way with the same characteristics.

Of course for any Centre the available information will still result in some trajectories being built locally and some making use of the IOP version, but the transition to this phase is marked by the preference to make use of the Flight Script and the locally calculated trajectory.

The flight will still be in advance of the IOP Unit and so the mechanism described in the previous phase applies for requesting updates to the FO.

This phase may begin the display of data to positions more responsible for ATC than ATM. Advanced planners, multi-sector planning functions will be provided with updated situational displays and internal to this phase local planners will begin to become part of the decision process and make entries to the flight plan.

Changes to the trajectory during this phase are subject to the section on coordination later in the document.

3.3.2.5.2 Coordination phases

Independent of the way the trajectories are calculated locally for the tools the coordination process is run in parallel, it consists of three phases:

- The System Awareness Phase (SAP),
- The Controller Awareness Phase (CAP), and
- The Negotiation Phase (NP).

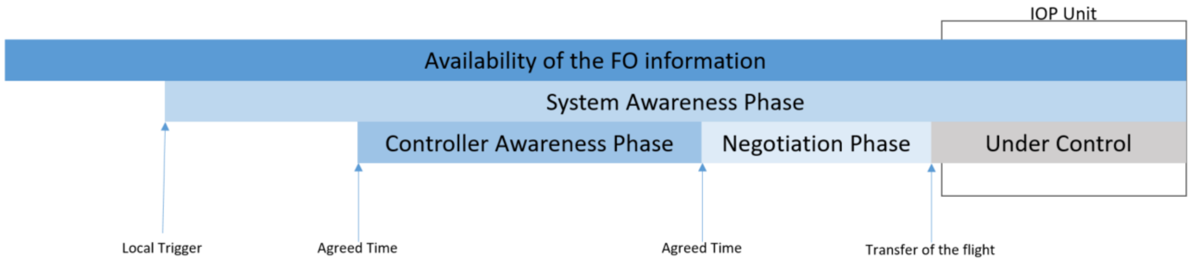


Figure 10: Coordination Phases

3.3.2.5.2.1 System awareness phase

The SAP starts based on a local trigger. An FDPS in SAP is fed by a continuous flow of information and contributes in order to keep aligned the FO and the local view of the flight data.

Changes during this phase, e.g. the inclusion of downstream sector constraints from flow positions etc. are accepted without the systems enforcing negotiation.

The decision to display to ATCO is made locally although the display is likely to be available to tools using a wider horizon than the controller's radar picture. For example, the information is available at flow positions which may use an air situation picture with a larger horizon.

As ATCOs might not be yet aware of the flight, the coordination has not yet started and is said to be in SAP.

3.3.2.5.2.2 Controller Awareness Phase

This phase is triggered either at an agreed time, distance or level prior to the boundary of the IOP Unit or by an event marking the moment when there is a set of common coordination information for the boundary between the IOP Units including an indication on whether the transfer conditions are standard or non-standard as bilaterally agreed. This event could be a time, distance or level from the common boundary and at this event both controllers are aware of the flight and information is displayed. This common awareness is indicated and the controllers know that if a dialogue is needed concerning a flight the partner may be consulted.

Changes to the C&T data during the CAP do not need to be acknowledged and it is up to the local implementation on whether they are highlighted or not.

Changes that require a response are forced on the display for the relevant position and in these cases will not be implemented in to the FO until agreed between these positions.

3.3.2.5.2.3 Negotiation Phase

The Negotiation phase begins at an agreed time, distance or level prior to the boundary of the IOP Units unless initiated by a specific action, e.g. Request on Frequency. Specific procedures (such as electronic negotiation of changes) apply during this phase in order to ensure that changes can be made in a safe way shortly before the transfer of control.

3.3.2.5.2.4 Controller actions impacting the phases

- Dialogue

A change to coordination data that is proposed by either the transferring or the receiving controller to the other partner in the CAP, in the SAP this is most likely to be initiated by a Flow type role. This proposal may be automatic due to bilateral agreements or may be selected by the sender. It is answered by an acceptance, a rejection or a counter proposal.

- Controller input to trigger CAP

An input to move into the CAP before the system determined time, it can be made by either the transferring or receiving controller.

- Coordination data modification

A change to coordination data made by either the transferring or the receiving controller. During the CAP this will be automatically modified in the other unit with local rules as to the indication to the ATCO.

- Change of frequency (triggers NP)

An indication by the sending unit that the flight has been instructed to change their selected frequency (channel) to the next unit and either call-in or monitor, waiting for the controller's to initiate the first call. This input also triggers the NP meaning that all modifications to the flight are expected to be agreed by both partners in the NP.

- Request on Frequency (from downstream, triggers NP)

An indication by the receiving unit to the transferring unit that they request the flight to be transferred to their frequency (channel). Usually earlier than the flight would normally be transferred and initiated because it is safer to have the flight in communication due to separation tasks or other clearances that need to be given. This input also triggers the NP meaning that all modifications to the flight must be agreed by both partners in the NP.

- Controller input to trigger NP

An input to move into the Negotiation Phase, it can be made by either the transferring or receiving controller.

- SKIP

An indication that an IOP Unit will not take the aircraft under control. The flight will remain with the previous, upstream, IOP Unit or be transferred directly to the next, downstream IOP Unit. More details in section 4.3.7

- NO_CONTACT

An indication that a Responsible IOP Unit will not take the aircraft on frequency (channel). The flight will remain with the previous IOP Unit (sector) or be transferred directly to the following. More details in section 4.3.7

- Delegate

  The ability to delegate a portion of a flight to a non-crossed IOP unit. More details in section 4.3.7

- Force-Assume

The ability to take control of a flight either earlier than expected or by a third party, outside of the normal distribution, for operational reasons such as an emergency.

3.3.2.5.2.5 Progression

The following schematic shows the progression of a flight along the phases:

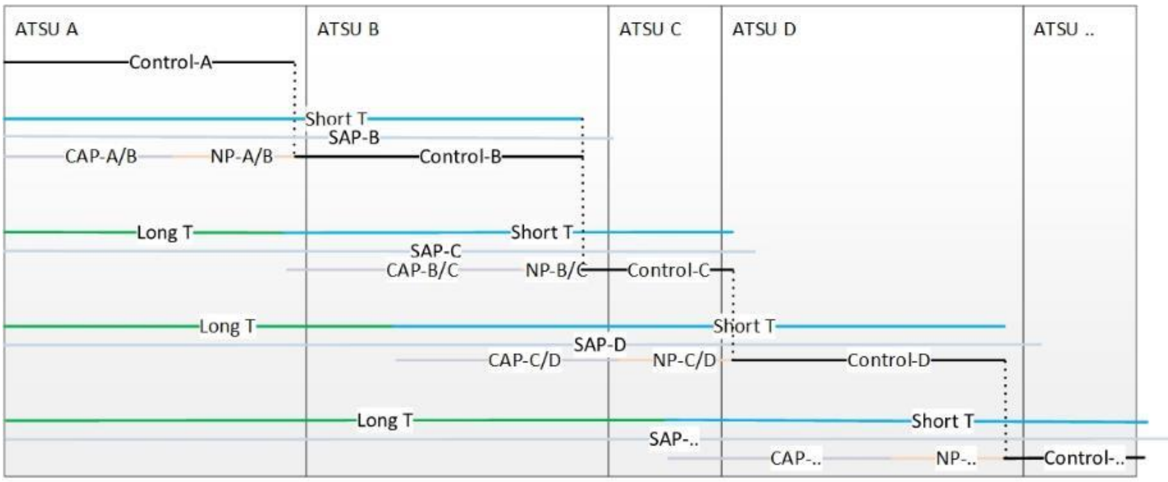


Figure 11: Progression across phases

The figure above shows the different phases compared to the sequence of centres derived from the trajectory. Each unit experiences the separate phases and the use of either the IOP Trajectory or the Flight Script is independent of the coordination status. As stated above although the use of the IOP Trajectory reduces the work at the local FDP level it is a local choice to make use of this.

3.3.2.5.3 Electronic Negotiation

As described above during the SAP and CAP phases the principle is that all changes are accepted without negotiation however nothing prevents a user from forcing a modification to be the subject of a negotiation if time permits to check the partner's acceptance in case of sensitive change or if it is considered advisable to negotiate. Changes performed during the SAP will most likely be related with Demand and Capacity Balancing (DCB) and Traffic Synchronisation (TS) purposes and changes performed during the CAP will most likely be related with Separation Management (SM) and Sector Workload Management (SWM).

The following items may be the subject of negotiation for SM and SWM purposes (not necessarily exhaustive):

- Co-ordinated tactical ATC conditions prior to transfer:
  - Transfer flight level;
  - Heading;
  - Speed;
  - Rate of climb/descent, and
  - DCT.

In order for the transferring and receiving unit to properly assess the impact of a change the units involved in the negotiation will apply the consequences (constraints etc.) of the change in order to visualise the impact on their respective airspace.

The unit to which the proposal is submitted is presented with the proposal and is able to accept it or reject it. An acceptance leads to the flight plan being updated while a rejection cancels the proposal and no change is executed.

A third option is available should the unit to which the proposal is submitted be able to accept the proposal but with a modification, in this case a counter proposal may be returned to the original unit with the proposed alternative containing the changes introduced by the questioned unit to the original change proposal. The originating unit, after evaluation, will be able to either accept or reject this counter proposal or counter-propose again. The number of counter proposals to agree a proposal is not limited by the system, the users themselves will naturally find a practical limit and use other means to find a resolution if needed.

Each type of negotiation will be handled by the appropriate operational actors at each involved stakeholder site. Each one of them will be supported by local systems with the appropriate analysis capabilities, time-horizons of interest, uncertainty estimations and known local environmental conditions. This being the case while it is expected that most negotiations will be conducted relatively quickly it may take some time before a response is received especially for more complicated requests. During this time it is possible that the active flight may be updated due to either system or manual actions. For example if a negotiation is ongoing between two downstream partners, an upstream unit may change a route or flight level changing the conditions, or validity of the downstream proposal.

3.3.2.6 Detailed Use Cases

The following Use-cases (UCs) intend to list the different steps of an operational process that will permit to validate IOP behaviour and functionalities.

They are described in detail by stepped actions which refer to operational requirements from this IOP INTEROP document.

Some steps are linked to several OPS requirements.

On the other hand, each step is not always linked to an IOP requirement as it may be dependent on other system requirements (local FDPS requirement, HMI requirement, CPDLC requirement…) but it is kept in order to describe the full expected behaviour of all the involved systems during the execution of the UC.

The "Assumptions" chapter may however briefly describe the consequences of different assumptions used to limit the number of steps in the Operational Method. Each step indicates if it will be operationally validated ("O") or technically verified ("S").

The List of Use-cases:

UC#	Feature	Title	Main case described
UC#0101	#1	Automatic Triggering of SAP/CAP/NP in compliance with LOA's	
UC#0102	#1	Manual Triggering of CAP/NP	
UC#0103	#1	Automatic Reversion from CAP/NP to SAP	
UC#0105	#1	Change of coordination data or trajectory during SAP	Transferring frequency and IOP_DSSR, no impact on 4DT
UC#0106	#1	Change of coordination data or trajectory during CAP	TFL, manual change, no impact on 4DT
UC#0109	#1	Change of C&T data or trajectory during NP without negotiation	TFL, same Transf. & Rec. REs, no impact on 4DT
UC#0112	#1	Request on Frequency	CAP, no cancellation of the request
UC#0113	#1	Change of Frequency & Assume	CAP
UC#0115	#1	Undo Send	

UC#	Feature	Title	Main case described
UC#0118	#1	Force-assume by the Receiving RE	CAP, no CPDLC
UC#0120	#1	Force-assume (FA) by an upstream/Further downstream RE	
UC#0124	#1	Point between Transferring & Receiving REs and Point cancellation	CAP, no RE between the Transferring & Receiving.
UC#0126	#1	Negotiation between Transferring RE and Receiving RE	CAP, TFL & Direct
UC#0127	#1	DCT Negotiation	
UC#0128	#1	Negotiation of C&T Contractual data and Trajectory by 2 FDCs	
UC#0133	#1	Force-assume from a skipped Unit	Skip in favour of the upstream, one RE in the skipped Unit, CAP, no CPDLC
UC#0136	#1	Reversion from NP to CAP	
UC#0201	#2	Creation and sharing of a constraint	TFL, Input from the Receiving RE, CAP
UC#0210	#2	Modification of 2D Route	No level change, CAP, A is controlling
UC#0214	#2	En route cruising level management	SAP, same REs involved
UC#0224	#2	Management of holding & stay constraint	
UC#0226	#2	Modification of IFR/VFR and OAT/GAT	
UC#0228	#2	Level band clearance	
UC#0231	#2	Closed Heading management	
UC#0234	#2	Management of active/inactive states of constraints	SAP, climbing phase, De/activation by Transferring
UC#0235	#2	Management of Diversion (new destination airport)	
UC#0240	#2	Projection of specific points	
UC#0243	#2	Sharing of executive constraints (CFL, Speed, Heading, Rate)	CAP, Open executive constraint
UC#0244	#2	Route amendment inside a downstream airspace	Phases, same REs involved, Direct, no constraint transfer
UC#0245	#2	Transfer of a constraint impacted by a route change	Phases, same REs involved, Direct
UC#0301	#9	FO creation & sharing	No IOP hole, SAP, first crossed creates, no STAY
UC#0304	#3	Distribution on bilateral rules (General information)	
UC#0306	#3	Manual subscription/unsubscription to FO	

UC#	Feature	Title	Main case described
UC#0401	#4	Management of discrepancies with local view	CAP, TFL
UC#0501	#5	Automatic Skip of an IOP Unit in favour of the upstream	
UC#0503	#5	Manual Unskip of an IOP Unit skipped in favour of the upstream	One RE skipped, Unskip by B
UC#0504	#5	Manual skipping the downstream IOP Unit	One RE to be skipped, no C&T data manually set, proposal by A, no rejection
UC#0506	#5	Internal sector skip/un-skip (control remains in same unit)	
UC#0510	#5	Manual partial delegation and cancellation	AoI crossed, Delegator is controlling, Same downstream, SAP, cancellation by Delegator
UC#0518	#5	"No_Contact" implementation	
UC#0521	#5	Re-entrant flight management	A flight crosses a unit before re-entering in the immediately upstream unit
UC#0801	#8	Modifying & Sharing the IOP_NSSR, IOP_ASSR & IOP_CSSR	
UC#0805	#8	To request and provide the IOP_DSSR	SAP
UC#807	#8	Sharing the Mode S flight Id	
UC#1101	#11	Departure Time update	
UC#1102	#11	SID Definition and Change	
UC#1103	#11	STAR Definition and Change (&Arrival transitions)	
UC#1105	#11	EAT allocation at IAF (transmission, open/closed constraint)	
UC#1109	#11	AMAN (indication of TTL / TTG & XMAN delay sharing)	

Table **22**: The List of Use Cases

3.3.2.6.1 IOP GENERAL MECHANISMS USE CASES

3.3.2.6.1.1 UC#0301: FO creation and sharing

This use case describes the process by which a flight object for a flight is created in a system and then distributed to all the Units who are concerned about this flight.

3.3.2.6.1.1.1 Actors

- First crossed IOP Unit – This IOP Unit will create a Flight Object and share it.
- All the downstream IOP Units – the Units that will receive the Flight Object for that particular flight.
- Aircraft – the flight for which the Flight Object has to be created.

3.3.2.6.1.1.2 Preconditions

1. All the participating Units are IOP enabled.
2. The Aircraft crosses only IOP area and there exists no Flight Object.
3. The FPL has been previously distributed by conventional legal channels to all actors.
4. As soon as the Flight Object is created and distributed, the other systems pass into SAP according to their local decision (system rule or human action).
5. No CAP is triggered between two subsequent IOP Units yet.

3.3.2.6.1.1.3 Assumptions

1. The first Flight Object is created by first AoR crossed IOP Unit (which becomes FDMP).
2. Should the FO be created by a further downstream IOP Unit which entered in SAP before the first crossed IOP Unit, the UC would apply the same way and the first IOP Unit would take the FDMP role when appropriate.
3. There's no STAY in the FPL used for this UC.
4. Should a STAY be mentioned in the FPL, requirement FSMG.0091would have to be added to step 2.

3.3.2.6.1.1.4 Operational Activity Description

The operating method is described below:

UC#0301			
Step	**Operating Method**	**V&V**	**Requirements**
1	After a local system flight plan is created, the first system to be traversed verifies that there doesn't exist an FO for this Aircraft. After verification, it finds no related FO and hence creates one FO.	S	Tech requirements GENE.0015
2	FO is created based on the filed FPL and includes: • its 2D route, • its level or speed changes and flight rules/type.	S	FSMG.0004 FSMG.0009
3	RFL are shared as En-route Cruise Levels.	S	FSMG.0092
4	The system adds all known constraints in the Flight Script: • Published constraints with their status (active/inactive), • Its own Private constraints.	S	FSMG.0010
5	The system calculates an IOP trajectory based on the constraints and put it into the Flight Object.	S	
6	The system defines the sequenced list of crossed IOP Units.	S	SEQM.0011 SEQM.0040
7	The system implements any (automatic) SKIP it's aware of by LoA.	S	SEQM.0001

UC#0301			
Step	**Operating Method**	**V&V**	**Requirements**
8	The system implements any Delegation it's aware of by LoA.	S	
9	The system computes the control sequence list according to the delegation implemented.	S	SEQM.0040
10	The system defines the list of IOP Units to who the Flight Object will be distributed.	S	SEQM.0014 SEQM.0006
11	The system fills in the Flight Object all the additional relevant information about the Aircraft.	S	COTR.0028 COTR.0030 GENE.0003
12	The system distributes the FO to the concerned stakeholders.	O	GENE.0001

Table 23: Operating Method for FO creation and sharing

3.3.2.6.1.2 UC#0401: Management of discrepancies with local view (basic part)

This use case describes the management of discrepancies between the flight object and the local SFPL.

Three sub-Use-Cases describe the different behaviours expected when a FO update is received:

1. To adapt one's local view in order to integrate the FO changes,
2. To request a FO correction to make it match with the local view,
3. To raise a desynchronization warning until a solution is found.

Sub-UC number 3 needs a desynchronization to be tested. The desynchronization itself is not part of the exercise (systems are not expected to become desynchronized) but every unexpected desynchronization might be an opportunity to test the scenario.

3.3.2.6.1.2.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.1.2.2 Preconditions

1. For every Aircraft used in this use case, the coordination phase between the Transferring and the Receiving REs is already in CAP.

3.3.2.6.1.2.3 Operational Activity Description

Sub Use-Case 1: SFPL update

The operating method is described below:

UC#0401-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring Unit updates the ECL of the Aircraft and share the flight object with the updated constraints.	O/S	
2	The Receiving Unit adapts its local SFPL with the new constraint received.	S	FSMG.0076

Table 24: Operating Method for SFPL update

Sub Use-Case 2: FO synchronization

The operating method is described below:

UC#0401-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring Unit performs a route modification of the flight and share the Flight Object with the updated route and constraints.	O/S	
2	The Receiving Unit updates its local SFPL and realizes that the new route hits a local strategic constraint.	S	FSMG.0076
3	The Receiving Unit asks for a modification of the list of constraints into the Flight Object.	S	FSMG.0076
4	In case the constraint is not inserted by the Transferring Unit (FDMP), the Receiving Unit shares a desynchronization warning after reception of the Flight Object update, according to local rules (See sub UC 3).	S	FSMG.0076

Table 25: Operating Method for FO synchronization

Sub Use-Case 3: Discrepancy management

NOTE: This Sub-UC corresponds to Technical UC#0404

The operating method is described below:

UC#0401-3			
Step	**Operating Method**	**V&V**	**Requirement**
1	For an Aircraft, the Receiving Unit system detects a discrepancy while comparing its FDPS view with elements of data contained in the FO.	S	FSMG.0076

UC#0401-3			
Step	**Operating Method**	**V&V**	**Requirement**
2	Based on local rules, the Receiving Unit system considers the discrepancy operationally pertinent and raises a desynchronization warning indicating the point where the desynchronization starts.	S	FSMG.0076 FSMG.0078
3	An ATCO manually modifies the TFL C&T data.	O	FSMG.0083
4	The modified TFL C&T data is shared.	S	COTR.0027 FSMG.0083
5	The Aircraft is transferred and assumed by the Receiving RE.	O	
6	The Receiving Unit removes the desynchronization warning and distributes a Flight Object consistent with its local view.	S	FSMG.0082

Table 26: Operating Method for management of discrepancies with local view

3.3.2.6.2 IOP DATA DISTRIBUTION USE CASES

3.3.2.6.2.1 UC#0304: Distribution on bilateral rules (General information)

This use case describes the process by which, according to agreed rules, Flight information on specific flights are shared with IOP partners which IOP Unit's Area of Interest is not planned to be crossed.

3.3.2.6.2.1.1 Actors

- Unit-A – The unit of which the AoR or AoI will be crossed
- Unit B – FDMP, the unit that has the flight under control and that can include other units to the distribution list
- Unit – C (informed unit) – The unit of which the AoI will **not** be crossed

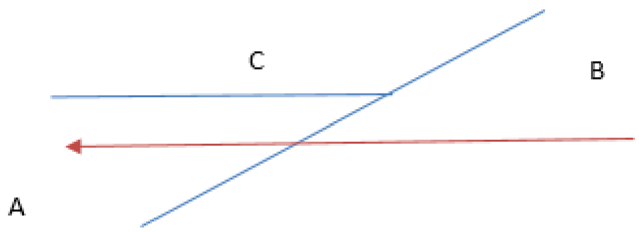


Figure 12: UC#0304 IOP Units Structure

3.3.2.6.2.1.2 Precondition

1. The AoI of the informed unit is not planned to be crossed.

2. Based on an agreement -i.e. bilateral rule- between unit-A and informed unit, Unit-A must distribute the FO to the informed unit.

3.3.2.6.2.1.3 Assumptions

No assumptions are foreseen for this UC

3.3.2.6.2.1.4 Operational Activity Description

The operating method is described below:

UC#0304			
Step	**Operating Method**	**V&V**	**Requirement**
1	The flight object is distributed to Unit-A. Unit-A enters SAP phase.	O	
2	Unit A requests the FDMP to include Unit C in the distribution list of the IOP units receiving the FO.	S	SEQM.0007
3	Unit C receives the FO for the aircraft	S	GENE.0001
4	The information related to the aircraft is available at any interested RE's in Unit C.	O	Local requirement

Table **27**: Operating Method for distribution on bilateral rules.

3.3.2.6.2.2 UC#0306: Manual subscription/unsubscription to FO

This use case describes the process by which an IOP Unit can subscribe or unsubscribe to a FO of a specific flight.

The operational context can be the following:

> The aircraft gets aware of a very bad weather forecast at destination. As a consequence, the flight crew or the FOC (Flight Operations Centre) contacts another control Unit in charge of a possible alternate in order to get all relevant pieces of information in case of diversion. As this Unit is not yet concerned by this aircraft (until it really decides to divert), the responding operator (e.g. ATCO) has to look for the flight information into the database in order to get a better idea of his position, type of aircraft, estimates…, all these data that might influence the decision (possible delay, stand availability…).
>
> Once the Flight crew is fully aware of the offered possibilities, he makes the decision not to divert to this airfield. The questioned Unit is no longer concerned by the flight and can unsubscribe from the distribution of the flight information.

3.3.2.6.2.2.1 Actors

Controlling Unit – The IOP Unit currently controlling the flight.

Downstream Unit - the IOP Unit following the Controlling Unit in the control sequence

Not-served Unit – An IOP Unit that initially does not receive the flight information for a specific flight (his Area of Interest is not crossed).

Aircraft – the flight controlled by the Controlling Unit and for which the Not-served Unit needs to manually seek the flight information.

3.3.2.6.2.2.2 Preconditions

The Point functionality to a NOT-served IOP Unit is not available (optional feature in Basic IOP).

3.3.2.6.2.2.3 Assumptions

1. The Area of Interest of the Not-served Unit is not crossed by the IOPtrajectory, and there's no other reason to be served (General information according to bilaterally agreed rules).

   *Should an additional reason of distribution appear between steps 2 and 6 (*SEQM.0007*), the manual unsubscription of step 6 would not stop the distribution until this reason is also cancelled (step 7).*

3.3.2.6.2.2.4 Operational Activity Description

The operating method is described below:

UC#0306			
Step	**Operating Method**	**V&V**	**Requirement**
1	Aircraft/FOC contacts the control Unit in charge of a possible diversion airfield.	O	
2	The responding operator subscribes to the FO for the Aircraft. The flight information is received by the Not-served Unit.	S	GENE.0002 SEQM.0009
3	The operator assesses the situation and provides the expected feedback to the Aircraft/FOC.	O	
4	Any flight information updated by the Controlling Unit is available to the Not-served Unit.	S	GENE.0002
5	Aircraft/FOC decides not to divert on this airfield.	O	
6	The operator of the Not-served Unit unsubscribes to the FO for the Aircraft.	S	SEQM.0010
7	As there is no other reason to maintain the distribution, the flight information is no longer received by the Not-served Unit.	S	

Table 28: Operating Method for Un/Subscription to FO

3.3.2.6.2.3 UC#0521: re-entrant flight management

This use case describes the management of re-entrant flight.

3.3.2.6.2.3.1 Actors

- Unit A – The IOP Unit crossed twice by the flight.
- Unit B – The Unit crossed between 2 parts of Unit A.
- Transferring RE A – the RE determined by the Unit A which will transfer the flight to the Receiving RE of Unit B (Receiving RE B)
- Receiving RE B – the RE determined by the Unit B which is expected to receive the flight from the Transferring RE A.
- Transferring RE B – the RE determined by the Unit B which will transfer the flight to the Receiving RE of Unit A (Receiving RE A)

- Receiving RE A – the RE determined by the Unit A which is expected to receive the flight from the Transferring RE B.
- Aircraft – the flight which is crossing Unit A, Unit B and Unit A again.

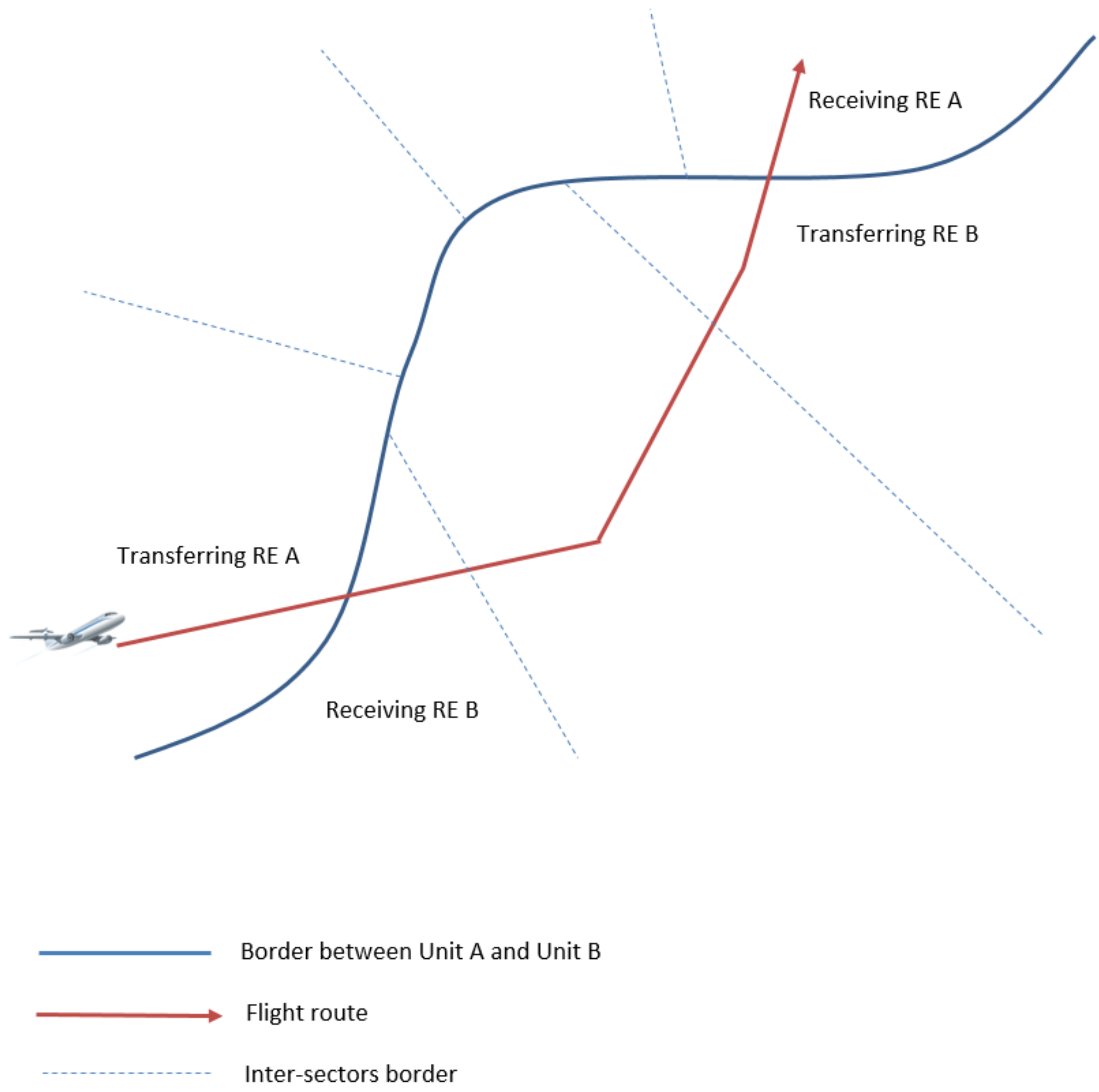


Figure 13: UC#0521 re-entrant flight management ATC Unit structure and flight route

3.3.2.6.2.3.2 Preconditions

- Unit A is already in System Awareness Phase (SAP).
- In Sub-Use Case 1, the flight is filed via Unit A – Unit B- Unit A
- In Sub-Use Case 2, the flight is filed via Unit A (Unit B is not planned to be crossed initially). The flight route in red on the drawing above represents the route after the re-routing.

3.3.2.6.2.3.3 Assumptions

1. Transferring RE A is different from Receiving Re A.
   Should Transferring RE A be the same as Receiving RE a, the use case remains valid.

2. Receiving RE B is different from Transferring RE B
   Should Receiving RE B be the same as Transferring RE B, the use case remains valid.

3.3.2.6.2.3.4 Operational Activity Description

Sub-Use Case 1: Planned re-entrance

UC#0521-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	Unit B enters in System Awareness Phase (SAP) for the concerned flight. It is triggered locally, based on internal rules. The Unit A shares the information to indicate it.	S	COTR.0001
2	The flight is assumed by the first crossed RE of Unit A.	O	
3	When the flight reaches a predetermined time/distance/level (as set by LOA) from Unit B entry point, the coordination phase between the Unit A and Unit B switches to Controller Awareness Phase (CAP) and the information is shared.	S	COTR.0007 COTR.0006
4	CAP shall be indicated to both Transferring RE A and Receiving RE B. Receiving RE B shall now have access to all the needed information and functionalities required to perform any coordination with the Upstream Unit about this flight.	O	COTR.0110
5	The C&T data between Unit A and Unit B can be changed as described in UC#0106 (Change of Coordination data or trajectory during CAP)	O	COTR.0027 COTR.0028
6	When the flight reaches a predetermined time/distance/level (as set by LOA) from Unit A second entry point, the coordination phase between the Unit B and Unit A switches to Controller Awareness Phase (CAP) and the information is shared.	S	COTR.0007 COTR.0006
7	CAP shall be indicated to both Transferring RE B and Receiving RE A. Receiving RE A shall now have access to all the needed information and functionalities required to perform any coordination with the Upstream Unit about this flight.	O	COTR.0110

UC#0521-1			
Step	**Operating Method**	**V&V**	**Requirement**
8	The C&T data between Unit B and Unit A (second transition) can also be changed as described in UC#0106 (Change of Coordination data or trajectory during CAP)		
9	When the flight reaches another predetermined time/distance/level (as set by LOA) from Unit B entry point, the coordination phase between the Unit A and Unit B switches to Negotiation Phase (NP) where any change in coordination data or 4D trajectory is expected to be negotiated.	S	COTR.0017 COTR.0016
10	NP shall be indicated to both Transferring RE A and Receiving RE B.	O	COTR.0027
11	The ATCO in Transferring RE A instructs the aircraft to change communication frequency to the Receiving RE B frequency and makes an input in the system.	O	
12	Unit A indicates that the flight has been instructed to change frequency to contact the Unit B.	S	COTR.0032
13	The flight crew establishes voice communication with the Receiving RE B.	O	
14	An ATCO in the Receiving RE B assumes the flight and the information about the change of transfer status is shared, which updates the transfer status in the Flight Object	O/S	COTR.0034
15	The Unit A system makes the transferring control team aware through the HMI that Receiving RE B is in communication with the flight. The Negotiation Phase ends.	O	COTR.0020
16	When the flight reaches another predetermined time/distance/level (as set by LOA) from Unit A second entry point, the coordination phase between the Unit B and Unit A switches to Negotiation Phase (NP) where any change in coordination data or 4D trajectory is expected to be negotiated.	S	COTR.0017 COTR.0016
17	NP shall be indicated to both Transferring RE B and Receiving RE A.	O	COTR.0027

UC#0521-1			
Step	**Operating Method**	**V&V**	**Requirement**
18	The ATCO in Transferring RE B instructs the aircraft to change communication frequency to the Receiving RE A frequency and makes an input in the system.	O	
19	Unit B automatically shares the information to indicate that the flight has been instructed to change frequency to contact the Unit A.	S	COTR.0032
20	The flight crew establishes voice communication with the Receiving RE A.	O	
21	An ATCO in the Receiving RE A assumes the flight and the information about the change of the transfer status is shared.	O	COTR.0034
22	The Unit B system automatically makes the transferring control team aware through the HMI that the Receiving Unit is in communication with the flight. The Negotiation Phase ends.	O	COTR.0020

Table 29: Operating Method for planned re-entrant

Sub-Use Case 2: Re-entrance due to a tactical re-routing

UC#0521-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	The flight is assumed by the first crossed RE of Unit A.	O	
2	ATCO in Unit A performs a re-routing via Unit B, re-entering later in Unit A.	O	
3	Coordination and transfer from Unit A to B and back to A can be performed as described in Sub-Use Case 1.		

Table 30: Operating Method for re-entrance due to a tactical re-routing

3.3.2.6.2.4 UC#0807: Sharing the Mode-S Flight ID

This use case describes the sharing of Mode S flight ID.

3.3.2.6.2.4.1 Actors

- Transferring Unit– The first IOP Unit crossed by the flight.
- Receiving Unit – Second IOP Unit crossed by the flight
- Aircraft – the flight which is crossing both the Transferring Unit and the Receiving Unit.

3.3.2.6.2.4.2 Preconditions

- Transferring and Receiving Unit are already in System Awareness Phase (SAP).
- Aircraft is Mode S equipped.

3.3.2.6.2.4.3 Assumptions

3.3.2.6.2.4.4 Operational Activity Description

The operating method is described below:

Step	Operating Method	V&V	Requirement
1	The transferring Unit correlates the local flight plan with the aircraft track.	S	
2	The system of the Transferring Unit shares the Mode S flight ID and the address received from the track through the FO.	S	SSRC.0008
3	The Receiving Unit retrieves the Mode S flight ID and correlates based on it. Note: Correlation logic depends on local implementation.	S	

Table 31: Operating Method for sharing the Mode-S flight ID

3.3.2.6.3 COORDINATION AND TRANSFER USE CASES

3.3.2.6.3.1 UC#0101: Automatic triggering of SAP/CAP/NP in compliance with LoA

This use case describes the process by which the coordination status between two adjacent IOP Units evolves according to the progress of the concerned flight.

3.3.2.6.3.1.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.3.1.2 Preconditions

1. The Transferring Unit is already in System Awareness Phase (SAP). This information (Transferring Unit in SAP) is present in the Flight Object.

2. The Receiving Unit is not yet in SAP.

3.3.2.6.3.1.3 Operational Activity Description

The operating method is described below:

UC#0101			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Receiving Unit enters in System Awareness Phase (SAP) for the concerned Aircraft. It is triggered locally, based on internal rules. The Receiving Unit updates the Flight Object to indicate it.	S	COTR.0001
2	Once in SAP, the Receiving Unit may update the coordination data depending on him if relevant and not already set by the Transferring Unit (Receiving frequency, Receiving sector Id, non-standard coordination, Downstream SSR code).	S	
3	When the Aircraft reaches a predetermined time/distance/level (as set by LOA) from the common boundary, the Flight Object is updated to indicate that the coordination phase between the Transferring and the Receiving REs is now in Controller Awareness Phase (CAP). *Note: As Transferring and Receiving Units shares the same LoA parameters, they might trigger the CAP and NP phases at the same time. It is technical issue to possibly avoid simultaneous requests. From operational point of view, no matter which Unit triggers these phases, but both must be capable if the other one fails doing it on time.*	S	COTR.0007 COTR.0006
4	HMIs of Receiving and Transferring REs shall indicate the CAP. Receiving RE shall now have access to all the needed information and functionalities required to perform any coordination with the Transferring RE about this Aircraft.	O	COTR.0110
5	When the Aircraft reaches another predetermined time/distance/level (as set by LOA) from the common boundary, the Flight Object is updated to indicate that the coordination phase between the two REs is now the Negotiation Phase (NP) where any change in coordination data is expected to be negotiated.	S	COTR.0017 COTR.0016
6	HMIs of Receiving and Transferring REs shall indicate the NP.	O	COTR.0110
7	The Transferring RE instructs the aircraft (by voice or CPDLC) to contact the Receiving RE.	O	
8	The aircraft establishes communication with the Receiving RE who assumes the Aircraft. This is the end of the NP.	S	COTR.0020 COTR.0110

Table 32: Operating Method for automatic Phases triggering

3.3.2.6.3.2 UC#0102: Manual Triggering of CAP/NP

This use case describes the process by which the coordination status between two adjacent IOP units evolves following manual actions.

3.3.2.6.3.2.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.3.2.2 Preconditions

1. The Receiving Unit is in System Awareness Phase (SAP).
2. The coordination phase between the Transferring and the Receiving REs is not yet in CAP.

3.3.2.6.3.2.3 Assumptions

1. The Transferring RE is controlling the Aircraft.

   Should the Transferring RE not control the Aircraft, the UC would remain valid.
2. As scope limitation, the CAP will be triggered by the Transferring RE.

   *The triggering of the CAP by the Receiving would imply requirement*COTR.0014.
3. As scope limitation, the NP will be triggered by the Transferring RE.

   *The triggering of the NP by the Receiving RE would imply requirement*COTR.0021.

3.3.2.6.3.2.4 Operational Activity Description

The operating method is described below:

UC#0102			
Step	**Operating Method**	**V&V**	**Requirement**
1	For any reason (e.g. has a verbal coordination with the Receiving RE), the Transferring RE triggers the CAP of the coordination with the Receiving RE before it was automatically triggered by an event derived from the LoA.	O	COTR.0013
2	HMIs of Receiving and Transferring REs shall indicate the CAP. Receiving RE shall now have access to all information and functionalities about this Aircraft.	O	COTR.0006
3	For any reason (e.g. avoiding any Receiving request which might interfere with a conflict), the Transferring RE triggers the NP of coordination with the Receiving RE before it was automatically triggered by an event derived from the LoA.	O	COTR.0022

UC#0102			
Step	**Operating Method**	**V&V**	**Requirement**
4	NP is available to both Transferring & Receiving REs.	O	COTR.0016

Table 33: Operating Method for manual Phases triggering

3.3.2.6.3.3 UC#0103: Automatic Reversion from CAP/NP to SAP

This use case describes the process by which the coordination status between two adjacent IOP units goes backwards to SAP due to an unexpected delay.

3.3.2.6.3.3.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE.

3.3.2.6.3.3.2 Preconditions

1. Transferring and Receiving REs are aware of the Aircraft, which means the boundary between the Transferring and Receiving REs is already either in CAP or in NP.
2. The delay experienced by the Aircraft is large enough to justify a reversion to SAP based on bilateral agreement between the Transferring and the Receiving Units.
3. There's no negotiation in progress between the Transferring and Receiving REs.

3.3.2.6.3.3.3 Assumptions

1. The coordination boundary between the Transferring RE and the Receiving RE is in CAP.

   Should the coordination boundary between the Transferring RE and the Receiving RE be in NP, the UC would remain valid.

2. The Aircraft is under control of the Transferring Unit.

   Should the Aircraft be under control of an upstream IOP unit of the Transferring Unit, the UC would remain valid.

3.3.2.6.3.3.4 Operational Activity Description

The operating method is described below:

UC#0103			
Step	**Operating Method**	**V&V**	**Requirements**
1	The Receiving Unit enters in System Awareness Phase (SAP) for the concerned flight. It is triggered locally, based on internal rules. The Receiving Unit updates the Flight Object to indicate it.	S	
2	When the flight reaches a predetermined time/distance/level (as set by LOA) from the common boundary, the Flight Object is updated to indicate that the coordination phase between the Transferring and the Receiving REs is now in Controller Awareness Phase (CAP). Note: As Transferring and Receiving Units shares the same LoA parameters, they might trigger the CAP and NP phases at the same time. It is technical issue to possibly avoid simultaneous requests. From operational point of view, no matter which Unit triggers these phases, but both must be capable if the other one fails doing it on time.	S	COTR.0007 COTR.0006
3	The flight is delayed and its time to the boundary becomes greater than the time parameter at which the CAP would be automatically triggered. How much greater is defined locally by adaptation	O	
4	The coordination phase of this boundary reverts to SAP. Note: Both Transferring and Receiving Units might trigger revert to SAP phase at the same time. It is technical issue to possibly avoid simultaneous requests. From operational point of view, no matter which Unit triggers these phases, but both must be capable if the other one fails doing it on time.	S	COTR.0023
5	Information is made available to the Transferring and Receiving REs that the coordination phase is now SAP	S/O	COTR.0001 COTR.0006

Table 34: Operating Method for Change of coordination data during SAP

3.3.2.6.3.4 UC#0105: Change of coordination data or trajectory during SAP

This use case describes the process by which the two adjacent IOP Units exchange data modifications thanks to the FO during the System Awareness Phase.

3.3.2.6.3.4.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.

- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE.

3.3.2.6.3.4.2 Preconditions

1. The Controller Awareness Phase has not yet been triggered.
2. The Flight Object contains the current coordination conditions that apply to the Aircraft at the common boundary between the two IOP Units. There's no negotiation in progress.
3. UC is limited to C&T data having no impact on trajectory and non-standard status.
4. The Transferring RE is neither skipped or No_Contact. (No_Contact could NOT be possible)
5. The Receiving RE is neither skipped or No_Contact. (No_Contact could be possible)

3.3.2.6.3.4.3 Assumptions

1. The Aircraft is under control of the Transferring RE.

    Should the Aircraft be under control of an upstream IOP Unit of the Transferring Unit, the UC remains valid.

3.3.2.6.3.4.4 Operational Activity Description

The operating method is described below:

UC#0105			
Step	**Operating Method**	**V&V**	**Requirements**
1	The Transferring RE modifies the transferring frequency and the transferring RE identification in the FO.	S	COTR.0030 COTR.0201 COTR.0202
2	The Receiving RE retrieves the information from the FO. No acknowledgement or approval is expected from the Receiving Unit. This information might be made available to the Receiving RE or not (local decision as it's not mandatory before the CAP).	S	COTR.0186 COTR.0109
3	Later, based on internal parameters, the Receiving Unit allocates an IOP_DSSR (Downstream SSR Code) to the Aircraft.	S	SSRC.0004
4	The Receiving Unit shares the IOP_DSSR code in the FO.	S	SSRC.0004
5	The Transferring Unit retrieves the information from the FO. No acknowledgement or approval is expected from the Transferring Unit. The IOP_DSSR code might be made available to the Transferring RE, this is a local decision.	S	GENE.0002

Table 35: Operating Method for Change of coordination data during SAP

3.3.2.6.3.5 UC#0106: Change of coordination data or trajectory during CAP

This use case describes the process by which the coordination data are changed during the CAP phase. Any change can be performed either by the Transferring or the Receiving REs involved in the coordination. The following process describes coordination changes when both IOP Units have entered the CAP phase.

3.3.2.6.3.5.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.3.5.2 Preconditions

1. Neither the Transferring nor the Receiving Unit/RE are skipped.

3.3.2.6.3.5.3 Assumptions

1. The Transferring RE is controlling the Aircraft.

    If the Transferring RE was not yet controlling the Aircraft, the UC would remain valid whatever the situation is:

    - *The controlling RE is another (upstream) RE of the Transferring Unit,*
    - *The controlling RE belongs to an upstream IOP Unit of the Transferring Unit.*

2. The coordination phase between the Transferring Unit and the Receiving REs is already in Controller Awareness Phase (CAP) and this information is included in the FO. The Transferring RE and the Receiving RE are officially aware of the Aircraft.

    If none of the Transferring and Receiving REs is in CAP yet, please refer to UC#0105.

    If the Receiving RE is not in CAP but the Transferring RE is aware of the Aircraft, Step 5 does not apply and the information is possibly made available to the Receiving RE according to local rules.

    If the Transferring RE in not in CAP (which means the Receiving RE awareness has been triggered before the awareness of the Transferring RE), Step 11 does not apply and the information is possibly made available to the Transferring RE according to local rules.

    If the Negotiation Phase is triggered between Transferring and Receiving REs, please refer to UC#0109.

    If the Transferring Unit is already in NP with regard to its own upstream, but the Receiving Unit is still in CAP, this Use-Case applies with no restriction.

3. The frequency change between the Transferring RE and the Receiving RE did not occur yet.

    *If the frequency change had occurred before the coordination data change, the Negotiation Phase would have been triggered (requirement*COTR.0103*) and in this case, please refer to UC#0109.*

4. The Receiving RE did not use the Request on frequency functionality before the coordination data change.

*If the Request on Frequency functionality had been used before the coordination data change, the Negotiation Phase would have been triggered (requirement*COTR.0043*) and in this case, please refer to UC#0109.*

5. The Flight Object contains the current coordination conditions that apply to the Aircraft at the common boundary between the two IOP Units. There's no negotiation in progress.

   An open negotiation on the same item (TFL) would be closed before the new TFL is entered (recommended local restriction). For TFL negotiation, please refer to UC#0126.

   An open negotiation on a different item would remain in progress but would be updated according to the new TFL set (See WIFO requirements).

6. In this Use-Case, the RE only modifies the Transfer Flight Level (TFL).

   This Use-case is however still valid with other coordination data modification with the application of the following additional requirements:

   - *Transferring RE, Transferring frequency, Receiving Sector & Receiving frequency:* COTR.0030*step 4 9, 11 & 12 are no longer relevant,*
   - *Supplementary Flight Level (SFL):* COTR.0137 *(Steps 2, 7 & 14) &* COTR.0148 *(Steps 2 & 9)*
   - *Direct:*COTR.0030 *& COTR.0139*
   - *Heading (value and direction):*COTR.0138, COTR.0149& COTR.0153
   - *Speed (≥, ≤, =, lowest, highest):*COTR.0140, COTR.0150& COTR.0154
   - *Rate of climb / descent (≥, ≤, =, highest):*COTR.0141, COTR.0151& COTR.0155

7. The TFL modification does neither change the control sequence, nor the transferring and receiving REs.

   A TFL change set by the Transferring RE modifying the receiving sector in the same Receiving Unit would imply a local process from the Receiving Unit between Steps 4 & 5 in order to reallocate the Aircraft to the appropriate RE (local removal of the Aircraft for the previous RE and information of the coming Aircraft to the new concerned RE). This local process would only have an IOP impact if the Receiving Unit has to modify some of the coordination data not already modified by the Transferring RE (e.g. receiving sector identification, receiving frequency, non-standard indication in case of late coordination for the new RE…).

   A TFL change set by the Receiving Unit modifying the transferring sector in the same Transferring Unit would imply a local process from the Transferring Unit between Steps 10 & 11 in order to reallocate the Aircraft to the appropriate RE (the new transferring one) and abrogate the Aircraft or modify the exit conditions of the former transferring RE. This local process would only have an IOP impact if the Transferring Unit has to modify some of the coordination data not already modified by the Receiving RE (e.g. transferring sector identification, transferring frequency…) or if the trajectory modification derived from this new TFL is not acceptable from Transferring Unit's point of view. In the latter case, the Transferring Unit would have to take appropriate action to solve this *incompatibility: new TFL input (through negotiation or not), possibly associated to a desynchronization warning until the issue is solved.*

*A TFL change set by the Transferring or the Receiving Unit which modifies respectively the Receiving or the Transferring Unit would modify the IOP Unit control sequence as described in UC#0210 and would involve the following additional requirements:*SEQM.0012*,* SEQM.0040*,* COTR.0007*,* COTR.0030*,* SEQM.0011*,* FSMG.0076*,*SEQM.0096*.*

3.3.2.6.3.5.4 Operational Activity Description

The operating method is described below:

UC#0106			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Controller Awareness Phase (CAP) status is available for the Transferring and the Receiving REs.	O	COTR.0110
2	The Transferring RE inserts in its HMI a new Transfer Flight Level at the boundary.	O	COTR.0027 COTR.0028
3	The Transferring Unit modifies the set of coordination data and all the impacted constraints in the FO.	S	COTR.0201
4	The IOP trajectory is recomputed taking into account the constraint associated to the TFL. The Transferring Unit assesses if the coordination conditions are standard or non-standard. The modified FO is shared.	S	FSMG.0002 COTR.0096
5	The Receiving Unit retrieves the new TFL and the new flight script from the FO. No acknowledgement or approval is expected.	S	
6	The Receiving Unit assesses if the coordination conditions are standard or non-standard.	S	COTR.0096
7	The Receiving RE shall be able to see the new TFL and the effects of this new flight script according to local rules.	O	COTR.0027
8	If the coordination is defined as non-standard, the non-standard status should be displayed to both Transferring and Receiving REs.	O	
9	The Receiving RE inserts in its HMI a new (entry) TFL at the boundary with its Transferring RE.	O	COTR.0028
10	The Receiving Unit modifies the set of coordination data and all the impacted constraints in the FO.	S	FSMG.0104 FSMG.0114 FSMG.0115 FSMG.0116

UC#0106			
Step	**Operating Method**	**V&V**	**Requirement**
11	The IOP trajectory is recomputed taking into account the constraint associated to the TFL. The Receiving Unit assesses if the coordination conditions are standard or non-standard. The modified FO is shared.	S	FSMG.0002 COTR.0096
12	The Transferring Unit retrieves the new TFL and the new flight script from the FO. No acknowledgement or approval is expected.	S	
13	The Transferring Unit assesses if the coordination conditions are standard or non-standard.	S	COTR.0096
14	The Receiving RE shall be able to see the new TFL and the effects of this new flight script according to local rules.	O	COTR.0027
15	If the coordination is defined as non-standard, the non-standard status should be displayed to both Transferring and Receiving REs.	O	COTR.0110

Table 36: Operating Method for Change of coordination data during CAP

3.3.2.6.3.6 UC#0109: Change of C&T data or trajectory during NP without electronic negotiation

The Negotiation Phase is made to prevent REs to change coordination data or 4D Trajectory without negotiation when the flight is quite close to the boundary or to the frequency change. It indicates to both Units that any coordination data change is expected to be negotiated (either verbally or electronically). It is triggered according to parameters defined in a Letter of Agreement or can be activated manually.

3.3.2.6.3.6.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is subject to change on the coordination data related to the boundary between the Transferring RE and the Receiving RE.

3.3.2.6.3.6.2 Preconditions

1. The boundary between the Transferring and Receiving Units is already in negotiation phase and this information is included in the FO.
2. There is not No_Contact RE between the Transferring and Receiving REs.
3. The Flight Object contains the current coordination conditions that apply to the Aircraft at the common boundary between the two Units. There's no negotiation in progress.

4. The TFL modification does not change the Transferring and Receiving REs.

3.3.2.6.3.6.3 Assumptions

1. The Aircraft is on the Transferring RE's frequency, within its AoR.

   Should the Aircraft be into the AoR of the Receiving RE, the UC would still be valid.

2. TFL is set at TFL1, automatically coordinated as per LoA between Transferring and Receiving Units.

   Should TFL1 had been previously set manually during CAP, the UC would still be valid.

3. TFL1 type of transition is defined as Wall.

   If TFL1 was defined as Layer, the UC would apply with no restriction.

3.3.2.6.3.6.4 Operational Activity Description

The operating method is described below:

UC#0109			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Negotiation Phase (NP) status is available for the Transferring and Receiving REs.	O	COTR.0110
2	The Transferring RE initiates verbal negotiation by calling the Receiving RE. He/She refers the aircraft ID and proposes a new Transfer Flight Level TFL2>TFL1 at the boundary. The Receiving RE agrees with this TFL2.	O	
3	The Transferring RE inserts in its HMI the agreed TFL2 as new agreed Transfer Flight Level at the boundary.	O	COTR.0028 COTR.0019
4	The Transferring RE defines the type of transition of the TFL as Wall (horizontal transition).	S	COTR.0027
5	TFL2 is shared with an indication of "closed" constraint for trajectory modelling.	S	FSMG.0104
6	TFL2 is shared with an indication of how the constraint will be complied with for trajectory modelling (e.g. "at or below").	S	FSMG.0017
7	The IOP trajectory is recomputed taking into account the constraint associated to TFL2 and the modified FO is shared.	S	FSMG.0002
8	Updated information TFL=TFL2 is presented to the concerned Transferring and Receiving REs. As the modified data has been telephonically agreed, the Receiving RE's HMI might display it with a smoother indication.	O	COTR.0027

Table 37: Operating Method for C&T data change during NP

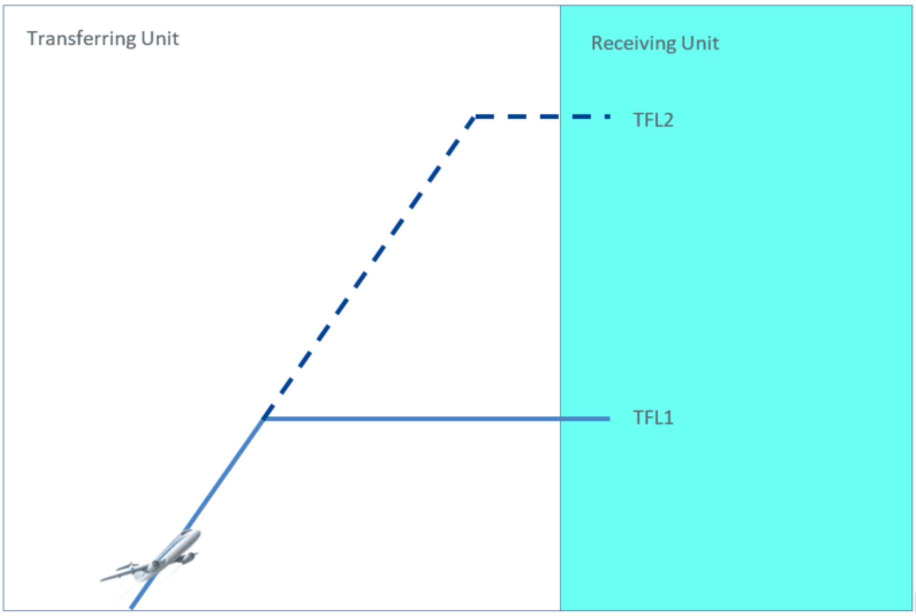


Figure 14: UC#0109 TFL exchange diagram

3.3.2.6.3.7 UC#0112: Request on Frequency

This use case describes the process of manual Request on Frequency between two adjacent IOP Units according to the progress of the concerned flight.

3.3.2.6.3.7.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. At the end of the process, the Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. At the end of the process, the Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.3.7.2 Assumptions

1. The Transferring RE is the controlling RE.

   Should the Aircraft be controlled by another RE of the Transferring Unit, from IOP point of view, only the Transferring RE and the Receiving RE, as defined in the coordination data by the two IOP Units, are concerned by this Request on Frequency functionality. Whether a further upstream RE currently controlling the Aircraft should be aware of this Request on Frequency or not is purely local behaviour and is out of scope of this UC.

2. The coordination phase between the Transferring RE and the Receiving RE is already in Controller Awareness Phase (CAP).

   If the coordination phase was Negotiation Phase, step 2 would no longer apply.

If the coordination phase was not yet CAP (but obviously Receiving RE had already enough information and functionalities available to perform a Request on Frequency),the Receiving RE should trigger the CAP in step 1 before sending the Request on frequency.

3. There's no negotiation in progress between Transferring and Receiving REs.

   A negotiation started before or during this UC would have no impact on the UC (it can be done between planners whereas the Request on Frequency is done by the Executive ATCO).

4. The Receiving RE does not cancel his Request on Frequency before the frequency change occurs.

   *If the Receiving RE changes his mind because he no longer urgently needs the traffic on his frequency, he can cancel the Request on Frequency (requirement**Error! Reference source not found.**). The Transferring RE should then be informed of this cancellation (local requirement).*

5. The Aircraft is not force-assumed by the Receiving RE before the Transferring RE performs the change of frequency.

   For Force-assume, please refer to UC#0118.

3.3.2.6.3.7.3 Operational Activity Description

This use case is triggered when the Receiving RE performs a Request on Frequency to the Transferring RE.

The operating method is described below:

UC#0112			
Step	**Operating Method**	**V&V**	**Requirement**
1	Receiving RE performs a Request on Frequency input related to the Aircraft before the frequency change has occurred from the Transferring RE.	O	COTR.0040 COTR.0042
2	The Request on Frequency input triggers the NP of the coordination phase between the Receiving and Transferring REs.	S	COTR.0043
3	The request on frequency as well as the Negotiation Phase should be available on the HMI in the Transferring RE.	O	COTR.0041 COTR.0016
4	The Transferring RE acknowledges the request by changing the frequency of the aircraft, via voice or CPDLC, to the Receiving RE.	O	
5	The Request on Frequency is terminated once the change of frequency is made to the Receiving RE.	S	COTR.0044

Table 38: Operating Method for Request on Frequency

3.3.2.6.3.8 UC#0113: Change of Frequency & Assume

This use case describes the process by which the transfer of communication with a flight from the current controlling RE (i.e. Transferring RE) to the Receiving RE is supported by the Flight Object. The flight should be coordinated between the Units before transfer, which means that the Controller Awareness Phase has been triggered beforehand (and possibly, the Negotiation Phase). Transfer of control will be effective in accordance with the LOA (e.g. coincident with transfer of communications, or at the boundary, or passing a level, etc.).

3.3.2.6.3.8.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. At the end of the process, the Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. At the end of the process, the Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring Unit to the Receiving Unit

3.3.2.6.3.8.2 Preconditions

1. The Transferring RE is controlling the Aircraft.
2. The Flight Object contains the agreed coordination conditions that apply to the flight at the common boundary between the two REs.
3. There's no negotiation in progress.

3.3.2.6.3.8.3 Assumptions

1. The coordination phase between the Transferring RE and the Receiving RE is CAP (Controller Awareness Phase).

   Should the coordination phase not be in CAP, the UC would remain valid.

2. The upstream unit(s) of the Transferring Unit is not IOP enabled.

   If it is, then step 1 would not apply as it would have shared the aircraft ATN or FANS/1A logon parameters itself.

3. No Request on Frequency is used in this UC.

   For the Request on frequency functionality, please refer to UC#0112.

3.3.2.6.3.8.4 Operational Activity Description

The operating method is described below within two sub-UCs:

- Sub-UC1: CPDLC is available and used for air-ground transfer of communication instructions,

  Note that in some situations, air-ground voice communications may be used in lieu of CPDLC. In the case of the latter, an aircraft response of WILCO or UNABLE is replaced with verbal readback or rejection of the air-ground communication.

  The case of open CPDLC dialogs is described in ED-228 and out of the scope of this use-case.

- Sub-UC2: CPDLC is not used for these air-ground transfer of communication instructions. As a consequence, this sub UC2 does not mention CPDLC at all.

Sub-UC1: CPDLC is available

UC#0113-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	The system of the Transferring Unit automatically shares the aircraft ATN or FANS/1A logon parameters it received either from the aircraft or from its upstream Unit via OLDI LOF message.	S	COTR.0100
2	After it sent the Next Data Authority message to the aircraft, the system of the Transferring Unit automatically shares the information that the aircraft has been notified.	S	COTR.0101
3	When the receiving Unit retrieves the information from the Flight Object that the aircraft has been notified of the Next Data Authority, its system sends a 'CPDLC-start' request to the aircraft system, and the aircraft system confirms the connection establishment via a 'CPDLC-start' response.	S	CPDLC requirement
4	The Transferring RE uses a CPDLC message to instruct the aircraft to change communication frequency to the Receiving RE's frequency and makes an input in his system.	O	
5	The Transferring Unit automatically updates the Flight Object to indicate that the Aircraft has been instructed to change frequency to contact the Receiving Unit.	S	COTR.0032
6	If the Negotiation Phase has not yet been triggered, the frequency change from the Transferring Unit triggers the Negotiation Phase to confirm the Receiving Unit that any change is expected to be negotiated.	S	COTR.0103
7	The Aircraft acknowledges the instruction to transfer communications via a WILCO (or via voice). The CPDLC connection between the Transferring RE and the Aircraft ends.	S	
8	The Receiving Unit system automatically retrieves the updated transfer status from the Flight Object and provides it to the Receiving RE through the HMI so that they are made aware of the imminent call on frequency of the Aircraft.	O	COTR.0110
9	After termination of CPDLC with the Transferring Unit, the Aircraft system notifies the Receiving Unit that it is the current data authority (CDA).	S	CPDLC requirement
10	The Aircraft establishes voice communication with the Receiving RE.	O	
11	The Receiving RE assumes the flight, which updates the transfer status in the Flight Object.	O	COTR.0034
12	The Receiving Unit sends facility designation, facility name and facility function to the Aircraft system for display to the flight crew.	S	CPDLC requirement

UC#0113-1			
Step	**Operating Method**	**V&V**	**Requirement**
13	The Transferring Unit system automatically retrieves the updated transfer status from the Flight Object and makes the Transferring RE aware through the HMI that the Receiving RE is in communication with the Aircraft. The Negotiation Phase ends.	O	COTR.0020 COTR.0110

Table 39: Operating Method for Change of Frequency with CPDLC & Assume

Sub-UC2: CPDLC is not used

UC#0113-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring RE instructs the aircraft via voice communications to change communication frequency to the Receiving RE's frequency and makes an input in his system.	O	
2	The Transferring Unit automatically updates the Flight Object to indicate that the Aircraft has been instructed to change frequency to contact the Receiving Unit.	S	COTR.0032
3	If the Negotiation Phase has not yet been triggered, the frequency change from the Transferring Unit triggers the Negotiation Phase to confirm the Receiving Unit that any change is expected to be negotiated.	S	COTR.0103
4	The Receiving Unit system automatically retrieves the updated transfer status from the Flight Object and provides it to the Receiving RE through the HMI so that they are made aware of the imminent call on frequency of the Aircraft.	O	COTR.0110
5	The Aircraft establishes voice communication with the Receiving RE.	O	
6	The Receiving RE assumes the flight, which updates the transfer status in the Flight Object.	O	COTR.0034
7	The Transferring Unit system automatically retrieves the updated transfer status from the Flight Object and makes the Transferring RE aware through the HMI that the Receiving RE is in communication with the Aircraft. The Negotiation Phase ends.	O	COTR.0020 COTR.0110

Table 40: Operating Method for Change of Frequency without CPDLC & Assume

3.3.2.6.3.9 UC#0115 Undo Send

This use case describes the process by which an ATCO who wrongly performed a transfer of frequency undoes it to recover the previous status.

3.3.2.6.3.9.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE.

3.3.2.6.3.9.2 Preconditions

1. The Aircraft is under control of the Transferring RE.
2. The coordination phase between the Transferring and the Receiving REs is either CAP or NP (SAP is not considered as nominal case).
3. Transferring RE has not yet made the transfer of communication input (on its HMI) to the Receiving RE. In step 1, the Transferring RE may or may not instruct the Flight crew/Aircraft to change the frequency to the Receiving RE.

In this UC we're focused on the manual action performed by the ATCO on its HMI to transfer the control ("to send") and not on the instruction delivered to the Flight crew to change the frequency.

3.3.2.6.3.9.3 Assumptions

1. The coordination phase between the Transferring and the Receiving REs is CAP.

   Should it be NP, Step 2, 6 & 7 would not apply and step 8 would display NP instead of CAP.

2. The input is made in CAP far from the triggering of the NP so that the undo-send should revert to CAP.

   Should the undo be done closer from the time parameter of triggering the NP, systems might keep NP in steps 7 & 8.

3. The CPDLC is not considered for this UC.

If a CPDLC message from the transferring RE to the Flight crew/aircraft has already been sent, the OPS Team suggests that it should be cancelled via voice to the Flight crew/aircraft (and not through CPDLC to avoid possible misunderstandings).

3.3.2.6.3.9.4 Operational Activity Description

The operating method is described below:

UC#0115			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE, in control of the aircraft, makes the input on its HMI to transfer the aircraft to the Receiving RE.	O	COTR.0032
2	The NP is triggered and shared	S	COTR.0103

UC#0115			
Step	**Operating Method**	**V&V**	**Requirement**
3	The HMI of the Transferring RE shows communication status “Frequency changed” and Aircraft not assumed by the Receiving RE.	O	COTR.0110
4	The HMI of the Receiving RE shows the communication status “Frequency changed” and Aircraft not assumed by the Receiving RE.	O	COTR.0110
5	Transferring RE makes an input on its HMI to undo the transfer to the Receiving RE.	O	COTR.0036
6	The Transferring & the Receiving Unit assess the reversion from NP to CAP according to local parameters.	S	COTR.0131
7	As both Units are in favour of reverting to CAP, the CAP status is made available to both REs.	O	COTR.0131
8	The “Frequency changed” status disappears from the HMI of the Transferring & Receiving REs , the Aircraft remaining assumed at the Transferring RE.	O	COTR.0110

Table 41: Operating Method for Undo-send

3.3.2.6.3.10 UC#0118 Force-assume by the Receiving RE

This use case describes the process by which a flight is force assumed by the Receiving RE before the Transferring RE has performed the frequency change input in the system.

3.3.2.6.3.10.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight currently controlled by the Transferring RE which is force-assumed by the Receiving RE.

3.3.2.6.3.10.2 Assumptions

1. The coordination phase between the Transferring and Receiving REs is CAP and this information is included in the FO. The Transferring RE and the Receiving RE are officially aware of the Aircraft.

   Should the coordination between Transferring and Receiving REs be in the Negotiation Phase, the UC would still be valid.

   Should the coordination between Transferring and Receiving REs not yet be in the Controller Awareness Phase, the UC would still be valid.

2. The Receiving Unit/RE is not skipped.

For a skipped Receiving Unit/RE, see UC#0133.

3. The frequency change input from the Transferring RE did not occur yet. The aircraft may have been verbally instructed to contact the Receiving RE and may have done it despite the Transferring RE didn't make the input on their HMI.

   This UC is also valid in case of erroneous Force-assumption by the Receiving RE without verbal frequency change instruction.

4. There's no CPDLC connection.

   Should a CPDLC connection exist between the Aircraft and the Transferring RE, the CPDLC End message would not be sent to the Aircraft by the Transferring RE until the Stolen information is acknowledged by the Transferring RE in order to avoid useless CPDLC connections in case of erroneous force-assumption followed by a corrective assumption from the Transferring RE.

3.3.2.6.3.10.3 Operational Activity Description

The operating method is described below:

UC#0118			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Receiving RE force assumes the Aircraft.	O	COTR.0216
2	The Stolen information is shared.	S	
3	The Transferring RE (previously controlling) and the Receiving RE (currently controlling) shall be notified that the Aircraft has been stolen.	O	COTR.0052
4	The Transferring RE acknowledges the Stolen information (meaning he agrees with the stealing) with an input into the system.	O/S	COTR.0053
5	The acknowledgement of the stolen information should be indicated on the HMI of both Transferring and Receiving REs.	O	COTR.0110

Table 42: Operating Method for Force-assume by the Receiving RE

3.3.2.6.3.11 UC#0120: Force-Assume (FA) by an Upstream/ Further Downstream RE

This use case describes the process by which a flight is force-assumed by the ATCO of an upstream RE and a further Downstream RE than the Receiving RE, removing the controlling role from all REs in between.

3.3.2.6.3.11.1 Actors

- Transferring RE – the RE determined by the IOP Unit in the control sequence, controlling the flight. After a FA by the Downstream RE the Transferring RE in this UC is called Transferring RE (previously controlling).

- Receiving RE('s) – RE('s) determined by the potential Receiving Units in the control sequence. A Receiving RE is expected to receive the flight from its Transferring RE.
- Further Downstream RE– any RE determined by a further downstream IOP Unit following the immediate downstream UNIT of the Transferring RE.
- Aircraft – the flight currently controlled by the ATCO of the Transferring RE which is force assumed by the ATCO of a Further Downstream RE.

3.3.2.6.3.11.2 Assumptions

1. The coordination phase between the further Downstream RE and its upstream RE is in SAP and this information is included in the FO.

   Should the coordination between the corresponding RE's be in the Negotiation Phase, the UC would still be valid.

   Should the coordination between Upstream and Downstream Units already be in the Controller Awareness Phase, the UC would still be valid.

2. The Further Downstream RE is not skipped.

   In order to validate a Force-Assumption by a skipped Further Downstream RE, UC#0133 'Force-assume from a skipped Unit' can be extrapolated.

3. The frequency change input from the Upstream Unit did not occur yet. The aircraft may have been verbally instructed to contact the further downstream Unit and may have done it despite the Upstream Unit didn't make the input on their HMI.

   This UC is also valid in case of erroneous Force-assumption by the Further Downstream Unit without verbal frequency change instruction.

4. There is no CPDLC connection.

   Should a CPDLC connection exist between the Aircraft and the Transferring *Unit, the CPDLC End message would not be sent to the Aircraft by the* Transferring *Unit until the Stolen information is acknowledged when this acknowledgment feature is available by the ATCO of the Transferring Unit in order to avoid useless CPDLC connections in case of erroneous force-assumption followed by a corrective assumption from the* Transferring *Unit.*

3.3.2.6.3.11.3 Operational Activity Description

The operating method is described below. There are two sub use cases

1. Force Assume by a further Downstream RE
2. Force Assume by the Transferring RE (previously controlling) after FA by a further DS RE

UC#0120 sub UC 1			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Further Downstream RE force assumes the Aircraft.	O	COTR.0216

UC#0120 sub UC 1			
Step	**Operating Method**	**V&V**	**Requirement**
2	The Transferring RE (previously controlling) and all receiving RE's in the control sequence located in between the Transferring RE and the Force Assuming RE are notified that the Aircraft has been stolen.	O	COTR.0056
3	The Transferring RE (previously controlling) acknowledges the Stolen information either manually or automatically.	O/S	COTR.0053
4	All receiving RE's in the control sequence located in between the Transferring RE and the Force Assuming RE can remove the Stolen information from their HMI. This has no impact on the FO.	O	Local HMI
5	The acknowledgement of the stolen information by the Transferring RE (previously controlling) is available for the Transferring RE (previously controlling) and Receiving RE (Force Assuming).	O	COTR.0110

Table 43: Operating Method for Force-assume by a Further Downstream RE

UC#0120 sub UC 2			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Further Downstream RE force assumes the Aircraft.	O	COTR.0216
2	The Transferring RE (previously controlling) and all receiving RE's in the control sequence located in between the Transferring RE and the Force Assuming RE are notified that the Aircraft has been stolen.	O	COTR.0056
3	The Transferring RE (previously controlling) force assumes the Aircraft.	O	COTR.0216
4	The stolen information from the previous FA (in step 2) is removed.		COTR.0054
5	The Transferring RE (previously controlling) will define its exit conditions according to local rules using the retained C&T data		COTR.0218

Table 44: Operating Method for FA by the Transferring RE (previously controlling) after FA by a further DS RE

3.3.2.6.3.12 UC#0124: Point between Transferring and Receiving REs and Point cancellation

This use case describes the process by which the point session is initiated and cancelled between two responsible entities.

The point function enables one RE to visualise and highlight a flight on the HMI of another RE, in a different centre, to support telephone coordination.

The point cancellation (unpoint) function enables the initiator of the point to subsequently remove the point (highlight) from the receiving RE's HMI. Cancellation may be used when the telephone coordination is complete, or to remove a point highlight that was made in error. The receiving RE controller can also cancel the point.

Any IOP unit can point a flight to any other IOP unit, regardless of whether they are on the control sequence or not. These two cases are described in separate sub-use cases below.

3.3.2.6.3.12.1 Actors

- Initiating RE – the RE who points the flight to the receiving RE
- Receiving RE – the RE who receives the point from the initiating RE
- Subject flight – the flight that is to be pointed to another IOP RE

3.3.2.6.3.12.2 Preconditions

- The Initiating RE has access to flight information for the flight

Note: An RE is not required to be on the control sequence to be eligible to initiate or receive a point or point cancellation – i.e. any IOP RE can point a flight to any other IOP RE. This is covered by sub use case 0124-2

3.3.2.6.3.12.3 Assumptions

- n/a

3.3.2.6.3.12.4 Operational Activity Description

The operating methods for 4 sub use cases are described below:

a) 0124-1: Point to RE already in control sequence, and cancelled by *initiating* RE

b) 0124-2: Point to RE already in control sequence, and cancelled by *receiving* RE

c) 0124-3: Point to RE *not* already in control sequence, and cancelled by *initiating* RE

d) 0124-4: Point to RE *not* already in control sequence, and cancelled by *receiving* RE

Note: 0124-1 and 0124-3 have the same operational flow (and for 0124-2 & 0124-4). These are nevertheless presented separately to assist mapping to the TS.

UC#0124-1: Point to RE already in control sequence, and cancelled by initiating RE			
Step	**Operating Method**	**V&V**	**Requirement**
1	The initiating RE controller points the subject flight to the receiving RE	O	COTR.0107 COTR.0085
2	The point indication is displayed on the receiving RE HMI. The identification of the initiating RE is made available to the receiving RE controller. Flight information for the subject flight is made available to the receiving RE controller. *Note: The Point itself is expected to be displayed whereas the display of the identifications is local HMI preference.*	O	COTR.0107 COTR.0085
3	The initiating RE controller phones the receiving RE controller and conducts a phone coordination.	n/a	n/a
4	After the phone coordination, the initiating RE cancels the point	O	COTR.0108 COTR.0168
5	The cancellation of the point is shared.	O	COTR.0108 COTR.0168
6	The point indication is removed from the receiving RE HMI.	O	n/a

Table 45: Operating Method for Point and Point Cancellation

UC#0124-2: Point to RE already in control sequence, and cancelled by receiving RE			
Step	**Operating Method**	**V&V**	**Requirement**
1	The initiating RE controller points the subject flight to the receiving RE	O	COTR.0107 COTR.0085

UC#0124-2: Point to RE already in control sequence, and cancelled by receiving RE			
Step	**Operating Method**	**V&V**	**Requirement**
2	The point indication is displayed on the receiving RE HMI. The identification of the initiating RE is made available to the receiving RE controller. Flight information for the subject flight is made available to the receiving RE controller. *Note: The Point itself is expected to be displayed whereas the display of the identifications is local HMI preference.*	O	COTR.0107 COTR.0085
3	The initiating RE controller phones the receiving RE controller and conducts a phone coordination.	n/a	n/a
4	After the phone coordination, the receiving RE cancels the point.	O	COTR.0108 COTR.0168
5	The point indication is removed from the receiving RE HMI.	O	n/a
6	The cancellation of the point is shared.	O	COTR.0108 COTR.0168
7	The cancellation is optionally displayed on the initiating RE's HMI.	O	n/a

Table 46: Operating Method for Point to RE already in control sequence, and cancelled by receiving RE

UC#0124-3: Point to RE not already in control sequence, and cancelled by initiating RE			
Step	**Operating Method**	**V&V**	**Requirement**
1	The initiating RE controller points the subject flight to the receiving RE	O	COTR.0107 COTR.0085

UC#0124-3: Point to RE not already in control sequence, and cancelled by initiating RE			
Step	**Operating Method**	**V&V**	**Requirement**
2	The point indication is displayed on the receiving RE HMI. The identification of the initiating RE is made available to the receiving RE controller. Flight information for the subject flight is made available to the receiving RE controller. *Note: The Point itself is expected to be displayed whereas the display of the identifications is local HMI preference.*	O	COTR.0107 COTR.0085 SEQM.0009
3	The initiating RE controller phones the receiving RE controller and conducts a phone coordination.	n/a	n/a
4	After the phone coordination, the initiating RE cancels the point	O	COTR.0108 COTR.0168
5	The cancellation of the point is shared.	O	COTR.0108 COTR.0168
6	The point indication is removed from the receiving RE HMI.	O	n/a

Table 47: Operating method for Point to RE not already in control sequence, and cancelled by initiating RE

UC#0124-4: Point to RE not already in control sequence, and cancelled by receiving RE			
Step	**Operating Method**	**V&V**	**Requirement**
1	The initiating RE controller points the subject flight to the receiving RE	O	COTR.0107 COTR.0085
2	The point indication is displayed on the receiving RE HMI. The identification of the initiating RE is made available to the receiving RE controller. Flight information for the subject flight is made available to the receiving RE controller. *Note: The Point itself is expected to be displayed whereas the display of the identifications is local HMI preference.*	O	COTR.0107 COTR.0085 SEQM.0009

UC#0124-4: Point to RE not already in control sequence, and cancelled by receiving RE			
Step	**Operating Method**	**V&V**	**Requirement**
3	The initiating RE controller phones the receiving RE controller and conducts a phone coordination.	n/a	n/a
4	After the phone coordination, the receiving RE cancels the point.	O	COTR.0108 COTR.0168
5	The point indication is removed from the receiving RE HMI. *Note: the point cancellation by the initiator implies an IOP information exchange between initiating and receiving REs, whereas a point cancellation by the receiving RE controller is limited to the local HMI.*	O	n/a
6	The cancellation of the point is shared.	O	COTR.0108 COTR.0168
7	The cancellation is optionally displayed on the initiating RE's HMI.	O	n/a

Table 48: Operating Method for Point to RE not already in control sequence, and cancelled by receiving RE

3.3.2.6.3.13 UC#0127: DCT negotiation

This use case describes the negotiation DCT between two following IOP Units in the control sequence.

3.3.2.6.3.13.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.3.13.2 Assumptions

1. The coordination phase between the Transferring and Receiving REs is in CAP.
   Should the coordination phase not yet be in CAP, the CAP might be triggered by any of the REs according to local rules in compliance with requirements COTR.0013 *or* COTR.0014. *Even if it's not triggered, the UC remains valid.*
   Should the coordination phase already be in NP, the UC would remain valid.
2. Transferring RE is controlling the Aircraft.
   Should the Aircraft be controlled by a further upstream RE, the use-case would apply but DCT clearance updating the route will either be performed after the

Transferring RE has assumed the flight or it will be performed by the RE currently assuming the flight (how to inform the RE controlling the flight of the DCT request is local matter).

3. 20 different situations of DCT negotiation, listed hereafter, have been identified. As described below, some situations have been described in Sub Use Cases, some situations need to be extrapolated from the other sub Use Cases.

    1. DCT from track negotiation initiated by the upstream – ACP (Sub Use Case 1)
    2. DCT from track negotiation initiated by the upstream – RJC (Sub Use Case 2)
    3. DCT from track negotiation initiated by the upstream – CP and ACP (Sub Use Case 3)
    4. DCT from track negotiation initiated by the upstream – CP and RJC (To be extrapolated from Sub Use Cases 2 and 3)
    5. DCT from track negotiation initiated by the downstream – ACP (Sub Use Case 4)
    6. DCT from track negotiation initiated by the downstream – RJC (Sub Use Case 6)
    7. DCT from track negotiation initiated by the downstream - CP and ACP (Sub Use Case 8)
    8. DCT from track negotiation initiated by the downstream - CP and RJC (To be extrapolated from Sub Use Cases 2 and 8)
    9. DCT from point negotiation initiated by the upstream – ACP (To be extrapolated from Sub Use Cases 1 and 5)
    10. DCT from point negotiation initiated by the upstream – RJC (To be extrapolated from Sub Use Cases 2 and 5)
    11. DCT from point negotiation initiated by the upstream – CP and ACP (To be extrapolated from Sub Use Cases 3 and 5)
    12. DCT from point negotiation initiated by the upstream – CP and RJC (To be extrapolated from Sub Use cases 2, 3 and 5)
    13. DCT from point negotiation initiated by the downstream – ACP (Sub Use Case 5)
    14. DCT from point negotiation initiated by the downstream – RJC (To be extrapolated from Sub Use Cases 5 and 6)
    15. DCT from point negotiation initiated by the downstream – CP and ACP (To be extrapolated from Sub Use Case 5 and 8)
    16. DCT from point negotiation initiated by the downstream – CP and RJC (To be extrapolated Sub Use cases 2, 5 and 8)
    17. DCT ‚NOW‘ Negotiation – ACP (Sub Use Case 7)
    18. DCT ‚NOW‘ Negotiation – RJC (To be extrapolated from Sub Use Cases 6 and 7)
    19. DCT ‚NOW‘ Negotiation – CP and ACP (To be extrapolated from Sub Use Case 7 and 8)
    20. DCT ‚NOW‘ Negotiation – CP and RJC (To be extrapolated from Sub Use Cases 2, 7 and 8)

3.3.2.6.3.13.3 Operational Activity Description

Sub Use Case 1 / DCT from track negotiation initiated by the upstream – ACP

UC#0127-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE initiates negotiation with Receiving RE for a DCT to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 COTR.0178

UC#0127-1			
Step	**Operating Method**	**V&V**	**Requirement**
2	Receiving Unit receives the proposal which is displayed to the Receiving RE.	O	Local HMI
3	Receiving RE accepts the proposal	O	COTR.0204
4	Transferring Unit receives the approval which is displayed to the transferring RE.	S	COTR.0214
5	The DCT information in the C&T data is updated and the negotiation process is closed.		COTR.0098 COTR.0209
6	The transferring RE sends the flight direct to the agreed point.	O	
7	Following the DCT input, the route is updated.	S	

Table 49: Operating Method for acceptance of DCT requested by the upstream Unit

Sub Use Case 2 / DCT from track negotiation initiated by the upstream – RJC

UC#0127-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE initiates negotiation with Receiving RE for a DCT to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 COTR.0178
2	Receiving Unit receives the proposal which is displayed to the Receiving RE.	O	Local HMI
3	Receiving RE rejects the proposal	O	COTR.0204
4	Transferring Unit receives the rejection which is displayed to the transferring RE.	S	COTR.0090 COTR.0214
5	The negotiation process is closed.		

Table 50: Operating Method for rejection of DCT requested by the upstream Unit

Sub Use Case 3 / DCT from track negotiation initiated by the upstream – CP and ACP

UC#0127-3			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE initiates negotiation with Receiving RE for a DCT to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 COTR.0178 **Error! Reference source not found.**
2	Receiving Unit receives the proposal which is displayed to the Receiving RE.	S	Local HMI
3	Receiving RE proposes another DCT point.	O	COTR.0205
4	The Transferring Unit receives the counter-proposal which is displayed to the Transferring RE.		Local HMI
5	Transferring RE accepts the counter-proposal		COTR.0204
6	The DCT information in the C&T data is updated and the negotiation process is closed.		COTR.0098
7	The Receiving Unit receives the acceptance which is displayed to the Receiving RE.	S	COTR.0214 COTR.0209
8	The transferring RE sends the flight direct to the agreed point.	O	
9	Following the DCT input, the route is updated.	S	

Table 51: Operating Method for counter-proposal of DCT initially requested by the upstream Unit

Sub Use Case 4 / DCT from track negotiation initiated by the downstream – ACP

UC#0127-4			
Step	**Operating Method**	**V&V**	**Requirement**
1	Receiving RE initiates negotiation with Transferring RE for a DCT to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 COTR.0178 **Error! Reference source not found.**
2	The Transferring Unit receives the proposal and displays it to the Transferring RE.	S	Local HMI
3	The Transferring RE accepts the proposal.	O	COTR.0204

UC#0127-4			
Step	**Operating Method**	**V&V**	**Requirement**
4	The Receiving Unit receives the acceptance which is displayed to the Receiving RE.	S	COTR.0214
5	The DCT information in the C&T data is updated and the negotiation process is closed.		COTR.0098 COTR.0209
6	The Transferring RE sends the flight direct to the agreed point.	O	
7	Following the DCT input, the route is updated.	S	

Table 52: Operating Method for acceptance of DCT requested by the upstream Unit

Sub Use Case 5 / DCT from point negotiation initiated by the downstream – ACP

UC#0127-5			
Step	**Operating Method**	**V&V**	**Requirement**
1	Receiving RE initiates negotiation with Transferring RE for a DCT from a point located inside the upstream Unit to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 COTR.0178 **Error! Reference source not found.**
2	The Transferring Unit receives the proposal and displays it to the Transferring RE.	S	Local HMI
3	The Transferring RE accepts the proposal.	O	COTR.0204
4	The Receiving Unit receives the acceptance which is displayed to the Receiving RE.	S	COTR.0214
5	The DCT information in the C&T data, and the route are updated and the negotiation process is closed.		COTR.0098 COTR.0208

Table 53: Operating Method for acceptance of DCT requested by the upstream Unit

Sub Use Case 6 / DCT from track negotiation initiated by the downstream – RJC

UC#0127-6			
Step	**Operating Method**	**V&V**	**Requirement**
1	Receiving RE initiates negotiation with Transferring RE for a DCT to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 **Error! Reference source not found.**
2	The Receiving Unit receives the proposal and displays it to the Transferring Unit.	S	Local HMI
3	The Transferring Unit RE rejects the proposal.	O	COTR.0204
4	The Receiving Unit receives the rejection which is displayed to the Receiving RE.	S	COTR.0214
5	The negotiation process is closed.	S	COTR.0090

Table 54: Operating Method for acceptance of DCT requested by the upstream Unit

Sub Use Case 7 / DCT ,Now Negotiation – ACP

UC#0127-7			
Step	**Operating Method**	**V&V**	**Requirement**
1	Receiving RE initiates negotiation with Transferring RE for a DCT to be performed as soon as possible to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 COTR.0178 COTR.0163 **Error! Reference source not found.**
2	The Receiving Unit receives the proposal and displays it to the Transferring Unit with the indication that the DCT is requested to be performed as soon as possible.	S	Local HMI
3	The Transferring Unit RE accepts the proposal and clear the flight to the requested point.	O	COTR.0204
4	The Receiving Unit receives the acceptance which is displayed it to the Receiving RE.	O	COTR.0204
5	The DCT information in the C&T data are updated and the negotiation process is closed.		COTR.0098 COTR.0209
6	As the result of the DCT clearance, the Transferring Unit update the route.		

Table 55: Operating Method for acceptance of DCT requested by the upstream Unit

Sub Use Case 8 / DCT from track negotiation initiated by the downstream - CP and ACP

UC#0127-8			
Step	**Operating Method**	**V&V**	**Requirement**
1	Receiving RE initiates negotiation with Transferring RE for a DCT to a point located inside the downstream Unit.	O	COTR.0087 COTR.0088 COTR.0178 **Error! Reference source not found.**
2	Transferring Unit receives the proposal which is displayed to the Transferring RE.		Local HMI
3	The Transferring RE proposes another DCT point		COTR.0205
4	The Receiving Unit receives the counter-proposal which is displayed to the Receiving RE.	S	Local HMI
5	The Receiving RE accepts the counter-proposal.	O	COTR.0204
6	The Transferring Unit receives the acceptance of the counter-proposal which is displayed in the Transferring RE.		COTR.0214
7	The DCT information in the C&T data are updated and the negotiation process is closed.	O	COTR.0098 COTR.0209
8	The Transferring RE clears the flight to the agreed DCT point.		
9	As the result of the DCT clearance, the Transferring Unit update the route.		

Table 56: Operating Method for acceptance of DCT requested by the upstream Unit

3.3.2.6.3.14 UC#0136: Reversion from NP to CAP

This use case describes the process by which the coordination status between two adjacent IOP units goes backwards to CAP due to an unexpected delay.

3.3.2.6.3.14.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE.

3.3.2.6.3.14.2 Preconditions

1. The delay experienced by the Aircraft is large enough to justify a reversion to CAP based on bilateral agreement between the Transferring and the Receiving Units.
2. There's no negotiation in progress between the Transferring and Receiving REs.

3.3.2.6.3.14.3 Assumptions

1. The boundary between the Transferring and Receiving REs is in NP which means that any change in coordination data is expected to be negotiated.
2. The Aircraft is under control of the Transferring Unit.

   Should the Aircraft be under control of an upstream IOP unit of the Transferring Unit, the UC would remain valid.

3.3.2.6.3.14.4 Operational Activity Description

The operating method is described below:

UC#0136-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	The flight is delayed due a holding with a defined exit time. Its time to the boundary becomes greater than the time parameter at which the NP would be automatically triggered. How much greater is defined locally by adaptation.	O	
2	The Unit-A and Unit-B allow the reversion to CAP.	O	COTR.0131
3	The coordination phase of this boundary reverts to CAP.	S	COTR.0131
4	Information is made available to the Transferring and Receiving REs that the coordination phase is now CAP.	S/O	COTR.0006 COTR.0110

Table 57: Operating Method for reversion to CAP.

UC#0136-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	The flight is delayed due to re-routing. Its time to the boundary becomes greater than the time parameter at which the NP would be automatically triggered. How much greater is defined locally by adaptation.	O	
2	The Unit-A and Unit-B allow the reversion to CAP while the ATCO of the Receiving RE doesn't allow the reversion to CAP.	O	COTR.0131
3	The coordination phase of this boundary remains NP.	S	COTR.0110

Table **58**: Operating Method for maintenance of NP.

3.3.2.6.4 WHAT-IF FLIGHT OBJECT USE CASES

3.3.2.6.4.1 UC#0126: Negotiation between Transferring RE and Receiving RE

This use case describes the negotiation of C&T Contractual data between two following IOP Units in the control sequence.

3.3.2.6.4.1.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.4.1.2 Assumptions

1. The coordination phase between the Transferring and Receiving REs is in CAP.
   Should the coordination phase not yet be in CAP, the CAP might be triggered by any of the REs according to local rules in compliance with requirements COTR.0013*or*COTR.0014*. Even if it's not triggered, the UC remains valid.*
   Should the coordination phase already be in NP, the UC would remain valid.
2. Transferring RE is controlling the Aircraft.
   Should the Aircraft be controlled by a further upstream RE, the use-case would apply with no restriction.
3. The C&T Contractual data proposed in the first proposal performed by the Transferring RE is a TFL.
   Should another C&T Contractual be negotiated, the UC would remain valid.

3.3.2.6.4.1.3 Operational Activity Description

Sub Use Case 1 / Acceptance

UC#0126-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE initiates negotiation with Receiving RE for a proposed Transfer Flight Level at the boundary.	O	COTR.0087 COTR.0088
2	Transferring Unit shares the proposal to the Receiving Unit	S	COTR.0088
3	Receiving Unit receives the proposal which is displayed to the RE.	O	COTR.0204 Local HMI
4	Receiving RE accepts the proposal	O	COTR.0204
5	Transferring Unit receives the approval, implements the change which is shared.	S	COTR.0098

UC#0126-1			
Step	**Operating Method**	**V&V**	**Requirement**
6	The involved REs are made aware of the results of the negotiation. The negotiation process is closed.	O	COTR.0214 COTR.0098

Table 59: Operating Method for acceptance of C&T data negotiation

Sub Use Case 2 / Rejection (Refusal)

UC#0126-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE initiates negotiation with Receiving RE for a proposed Transfer Flight Level at the boundary.	O/S	COTR.0087 COTR.0088
2	Transferring Unit distributes the proposal to the Receiving Unit	S	COTR.0088
3	Receiving Unit receives the proposal which is displayed to the RE.	S/O	Local HMI
4	Receiving Unit/RE rejects the proposal	O	COTR.0204
5	Transferring Unit receives the rejection of the proposal	S	
6	Transferring Unit displays the rejection to the RE and the negotiation process is closed.	O	COTR.0214 COTR.0090

Table 60: Operating Method for rejection of C&T data negotiation

Sub Use Case 3 / Counter-proposal Accepted

UC#0126-3			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE initiates negotiation with Receiving RE for a proposed Transfer Flight Level at the boundary.	O/S	COTR.0087 COTR.0088
2	Transferring Unit distributes the proposal to the Receiving Unit	S	COTR.0088
3	Receiving Unit receives the proposal which is displayed to the RE.	S	Local HMI

UC#0126-3			
Step	**Operating Method**	**V&V**	**Requirement**
4	Receiving RE performs a counter-proposal with another TFL and distributes it.	O	COTR.0205
5	Transferring Unit receives the counter-proposal	S	COTR.0088
6	Transferring Unit displays the counter-proposal to the RE	O	Local HMI
7	Transferring RE accepts the counter-proposal	O	COTR.0205
8	Transferring Unit implements the change which is shared.	S	COTR.0098
9	The involved REs are made aware of the results of the negotiation. The negotiation process is closed.	O	COTR.0214 COTR.0098

Table 61: Operating Method for acceptance of C&T data counter-proposed

Sub Use Case 4 / Counter-proposal Rejected

UC#0126-4			
Step	**Operating Method**	**V&V**	**Requirement**
1	Transferring RE initiates negotiation with Receiving RE for a proposed Transfer Flight Level at the boundary.	O/S	COTR.0087 COTR.0088
2	Transferring Unit distributes the proposal to the Receiving Unit	S	COTR.0088
3	Receiving Unit receives the proposal which is displayed to the RE.	S	Local HMI
4	Receiving RE performs a counter-proposal with another TFL and distributes it.	O	COTR.0205
5	Transferring Unit receives the counter-proposal	S	COTR.0088
6	Transferring Unit displays the counter-proposal to the RE	O	Local HMI
7	Transferring RE rejects the counter-proposal	O	COTR.0204
8	Receiving Unit receives the rejection of the counter-proposal and the negotiation process is closed	S	COTR.0090
9	Receiving Unit displays the rejection to the RE	O	COTR.0214

Table 62: Operating Method for rejection of counter-proposal

3.3.2.6.4.2 UC#0128 Negotiation of C&T Contractual data between 2 FDCs

This use case describes the negotiation of C&T contractual data and trajectory as described in UC#0126, but here by 2 IOP Units that are not controlling the flight.

3.3.2.6.4.2.1 Actors

- Controlling Unit – The RE currently controlling the flight.
- Downstream Unit-1 - The RE in the control sequence
- Downstream Unit-2 - The further RE that following the Downstream Unit-1 in the control sequence

3.3.2.6.4.2.2 Preconditions

1. Neither Downstream Unit-1 nor Downstream Unit-2 is controlling the traffic yet. Both IOP Units are FDC Assumptions
2. The coordination phase between the Downstream Unit-1 and the Downstream Unit-2 is already in CAP.

   Should the coordination phase between the Downstream Unit-1 *and the* Downstream Unit-2 *be in SAP or NP, the UC remains valid*

3. The C&T Contractual data proposed in the first proposal performed by the Downstream Unit-1 is a TFL.

   Should another C&T Contractual data be negotiated, the UC would remain valid.

4. The proposing RE is the Downstream Unit-1.

   Should the Downstream Unit-2 *be the proposing RE, the UC would remain valid.*

3.3.2.6.4.2.3 Operational Activity Description

Sub Use Case 1 / Acceptance

UC#0128-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	Downstream Unit-1 initiates electronic negotiation with Downstream Unit-2 for a proposed Transfer Flight Level at the boundary.	O	COTR.0087 COTR.0088
2	Downstream Unit-1 shares the proposal to the Downstream Unit-2	S	COTR.0088
3	The proposal is displayed to the Downstream Unit-2	S/O	Local HMI
4	Downstream Unit-2 accepts the proposal	O	COTR.0204
5	Downstream Unit-1 receives the acceptance, and informs the FDMP about the C&T contractual data change. The negotiation process is closed.	S	COTR.0098
6	The involved REs are made aware of the results of the negotiation.	O	COTR.0214

Table 63: Operating Method for acceptance of C&T data negotiation

Sub Use Case 2 / Rejection

UC#0128-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	Downstream Unit-1 initiates electronic negotiation with Downstream Unit-2 for a proposed Transfer Flight Level at the boundary.	O/S	COTR.0087 COTR.0088
2	Downstream Unit-1 shares the proposal to the Downstream Unit-2	S	COTR.0088
3	The proposal is displayed to the Downstream Unit-2.	S/O	COTR.0204 Local HMI
4	Downstream Unit-2 rejects the proposal	O	COTR.0204
5	Downstream Unit-1 receives the rejection of the proposal.	S	
6	The rejection is displayed to the Downstream Unit-1 and the negotiation process is closed.	O	COTR.0214 COTR.0090

Table 64: Operating Method for rejection of C&T data negotiation

Sub Use Case 3 / Counter-proposal Accepted

UC#0128-3			
Step	**Operating Method**	**V&V**	**Requirement**
1	Downstream Unit-1 initiates electronic negotiation with Downstream Unit-2 for a proposed Transfer Flight Level at the boundary.	S/O	COTR.0087 COTR.0088
2	Downstream Unit-1 shares the proposal to the Downstream Unit-2	S	COTR.0088
3	The proposal is displayed to the Downstream Unit-2.	S/O	Local HMI
4	Downstream Unit-2 performs a counter-proposal with another TFL and distributes it.	O	COTR.0205
5	Downstream Unit-1 receives the counter-proposal	S	COTR.0088
6	The counter-proposal is displayed to the Downstream Unit-1	O	Local HMI

UC#0128-3			
Step	**Operating Method**	**V&V**	**Requirement**
7	Downstream Unit-1 accepts the counter-proposal informs the FDMP about the C&T contractual data change. The negotiation process is closed.	O	COTR.0098 COTR.0204
9	The involved REs are made aware of the results of the negotiation.	O	COTR.0214

Table 65: Operating Method for acceptance of C&T data counter-proposed

Sub Use Case 4 / Counter-proposal Rejected

UC#0128-4			
Step	**Operating Method**	**V&V**	**Requirement**
1	Downstream Unit-1 initiates electronic negotiation with Downstream Unit-2 for a proposed Transfer Flight Level at the boundary.	O/S	COTR.0087 COTR.0088
2	Downstream Unit-1 shares the proposal to the Receiving Unit	S	COTR.0088
3	The proposal is displayed to the Downstream Unit-2.	S	COTR.0204 Local HMI
4	Downstream Unit-2 performs a counter-proposal with another TFL and distributes it.	O	COTR.0205
5	Downstream Unit-1 receives the counter-proposal	S	COTR.0088
6	The counter-proposal is displayed to the Downstream Unit-1	O	Local HMI
7	Downstream Unit-1 rejects the counter-proposal and closes the negotiation process.	O	COTR.0090 COTR.0098
8	The involved REs are made aware of the results of the negotiation.	O	COTR.0214

Table 66: Operating Method for rejection of counter-proposal

Sub Use Case 5 / Implementation failure

UC#0128-5			
Step	**Operating Method**	**V&V**	**Requirement**
1	Downstream Unit-1 initiates electronic negotiation with Downstream Unit-2 for a proposed Transfer Flight Level at the boundary.	O	COTR.0087 COTR.0088
2	Downstream Unit-1 shares the proposal to the Downstream Unit-2	S	COTR.0088
3	The proposal is displayed to the Downstream Unit-2.	S/O	Local HMI
4	Downstream Unit-2 accepts the proposal	O	COTR.0204
5	Downstream Unit-1 receives the acceptance, The REs involved in the negotiation are made aware of the acceptance. The negotiation process is closed.	S	COTR.0098
6	The Transferring Unit informs the FDMP about the C&T contractual data change.	S	
7	For any reason, the change is not implemented by the FDMP.	S	
8	The REs involved in the negotiation are made aware of the rejection by the FDMP.	O	COTR.0214

Table 67: Operating Method for implementation failure

3.3.2.6.5 FLIGHT SCRIPT MANAGEMENT USE CASES

3.3.2.6.5.1 UC#0201: Creation and sharing of a constraint

This use case describes the management of a level constraint modified by the receiving RE.

3.3.2.6.5.1.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.5.1.2 Preconditions

1. The modified TFL2 remains different from the ECL.

2. The Target Start Point of TFL1 is applicable at the boundary (no other TCP defined by LoA).

3.3.2.6.5.1.3 Assumptions

1. The Aircraft is assumed by the Transferring RE.

   Should the Aircraft not yet be assumed/under control of the Transferring RE, the UC remains applicable.

2. A strategic constraint SC [At or below] with a Target end Point at the boundary is already provided and determines a TFL at the boundary between the two IOP Units different from the ECL.

   Should SC be equal to ECL, the UC remains valid.

   Should SC be larger than ECL, then TFL1=ECL should be assigned in the FO and the UC is not valid since further steps would have to be added prior to step 1.

3. CAP is already triggered for this Aircraft between the Transferring and Receiving Units.

   Should the boundary be in NP, the UC is not valid since a C&T data negotiation would have to be carried prior to step 1.

   Should the boundary not be yet in CAP, the UC is not valid since step 1 is not possible.

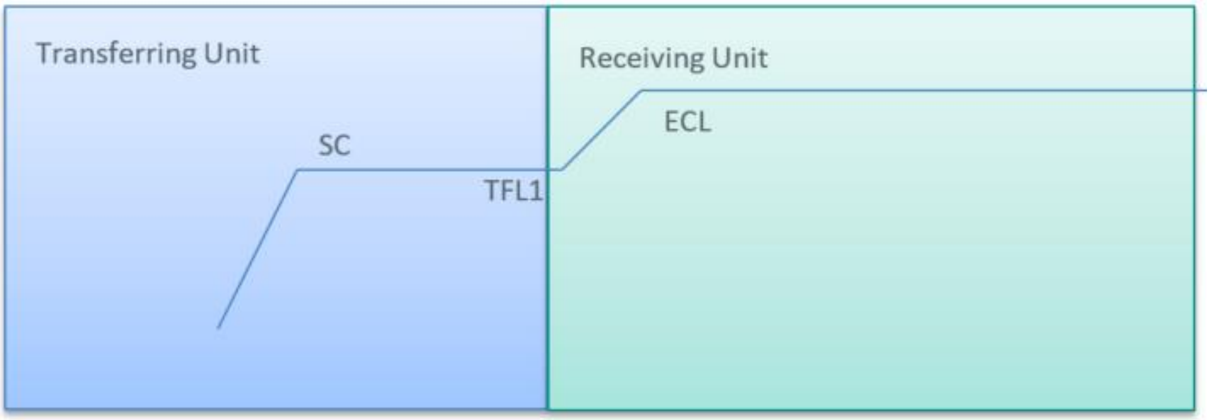


Figure 15: **Initial constraints and TFL**

This Use-Case is triggered when the downstream Unit modifies a pre-defined TFL.

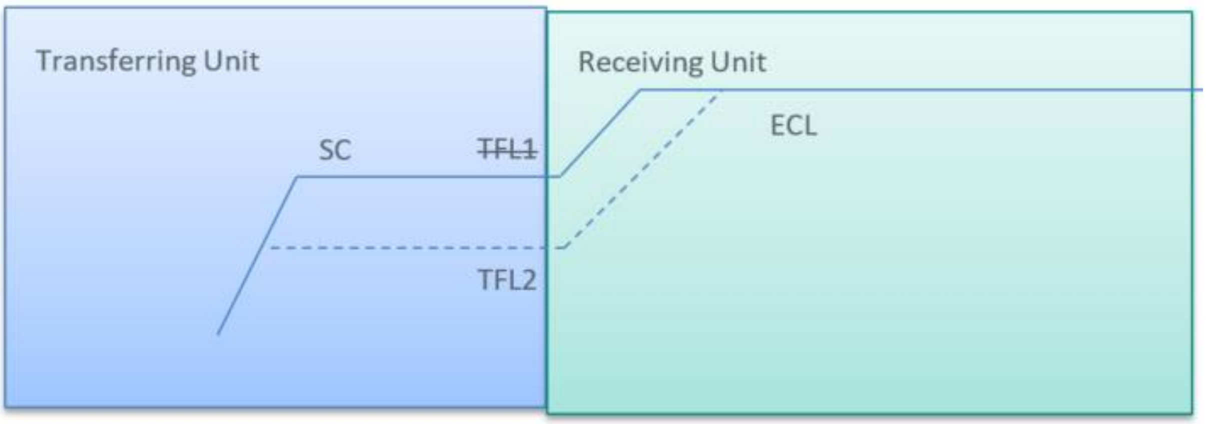


Figure 16: Final applicable constraints and new TFL

3.3.2.6.5.1.4 Operational Activity Description

The operating method is described below:

UC#0201			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Receiving RE modifies the entry flight level of the Aircraft from TFL1 to TFL2. The TFL2 type of transition is "Wall" (horizontal transition).	O	COTR.0028 COTR.0027
2	Based on the Receiving RE input, the Receiving Unit defines the characteristics of the constraint associated to this TFL2.	S	FSMG.0060 FSMG.0017
3	The Receiving Unit makes a reassessment of the other constraints for which it is eligible and shares all the modifications.	S	FSMG.0001
4	The IOP trajectory is recomputed taking into account the constraint associated to the TFL2 and the modified FO is distributed.	S	FSMG.0010 FSMG.0002
5	The Transferring Unit displays the new exit flight level (TFL2) with indication of type of transition "Wall" to the Transferring RE.	O	COTR.0027
6	The Transferring RE issues the clearance in compliance with the TFL2.	O	
7	The CFL clearance is shared.	S	FSMG.0034

Table 68: Operating Method for level constraint entered by downstream

3.3.2.6.5.2 UC#0214: En route cruising level management

This use case describes the management of cruising level.

3.3.2.6.5.2.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft1 – the first flight which is to be transferred from the Transferring RE to the Receiving RE.
- Aircraft2 – the second flight which is to be transferred from the Transferring RE to the Receiving RE.

3.3.2.6.5.2.2 Preconditions

1. The flight plan of Aircraft1 is filed with an initial level (FL1).
2. Two strategic constraints are applicable to Aircraft1, SC1 and SC2, both shared and defined as "at or below".
3. The coordination phase between the Transferring Unit and the Receiving Unit is in SAP.
4. The ECL changes do not create non-standard coordination conditions.
5. The ECL changes do not modify the REs involved in the transfer between the two IOP Units.

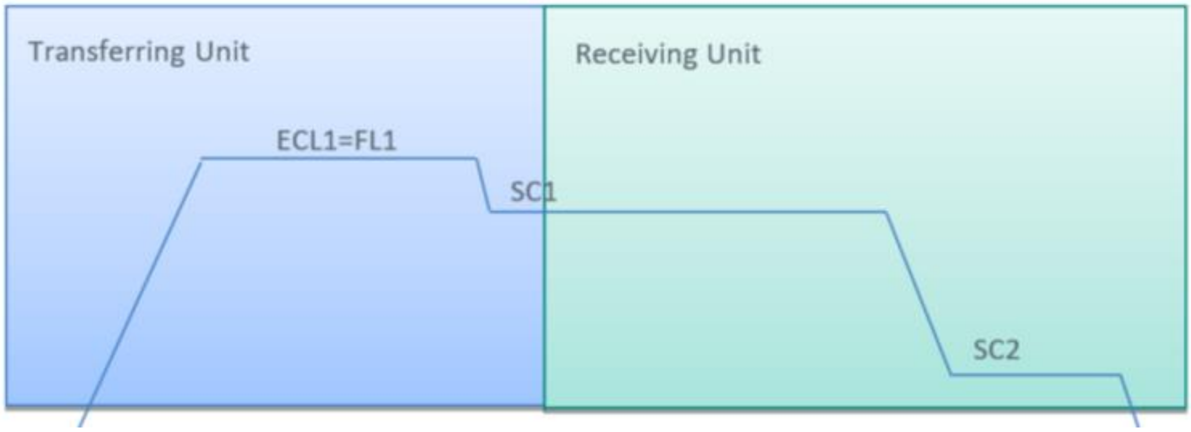


Figure 17: List of applicable vertical constraints at creation

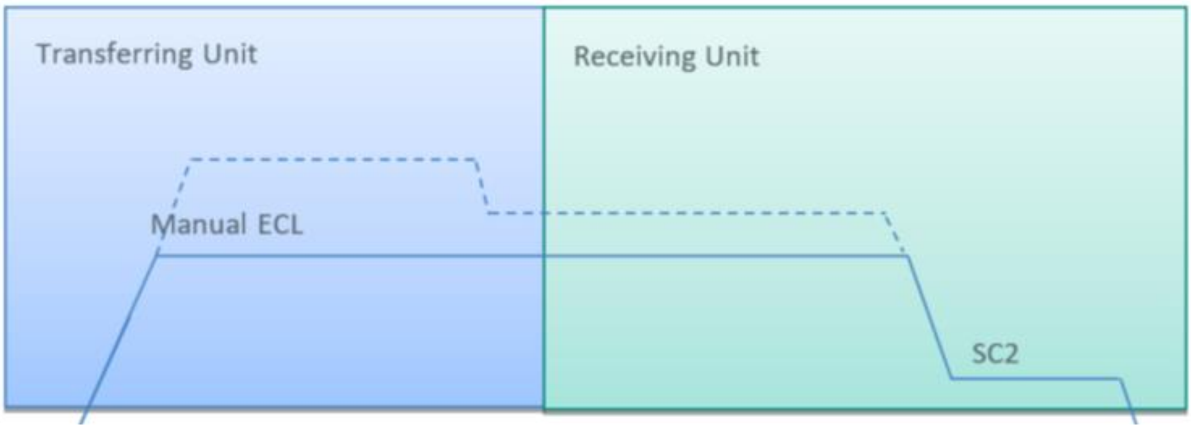


Figure 18: List of applicable vertical constraints after ECL input for the first flight

6. The flight plan of Aircraft2 is filed with three levels, two applicable in the Transferring Unit and the third one applicable in the Receiving Unit.

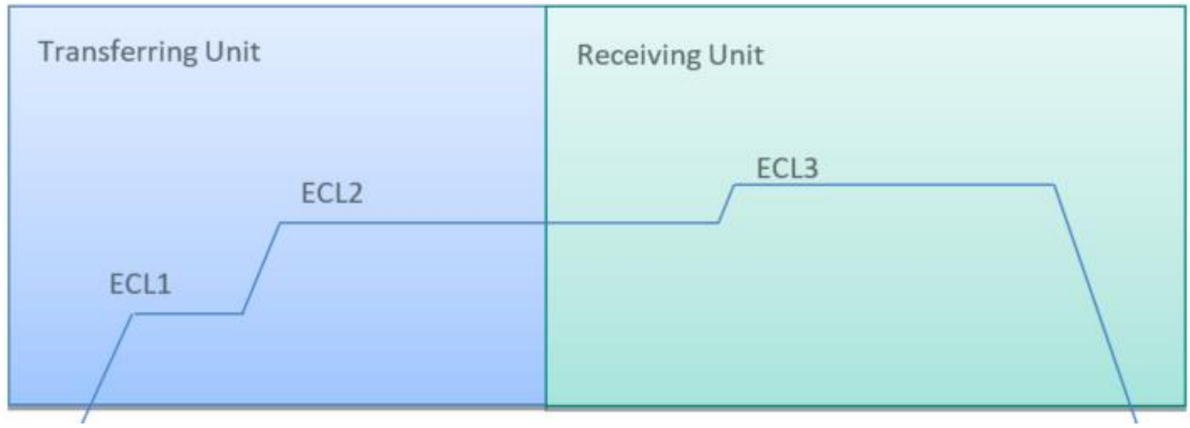


Figure 19: **List of applicable vertical constraints at creation for the second flight**

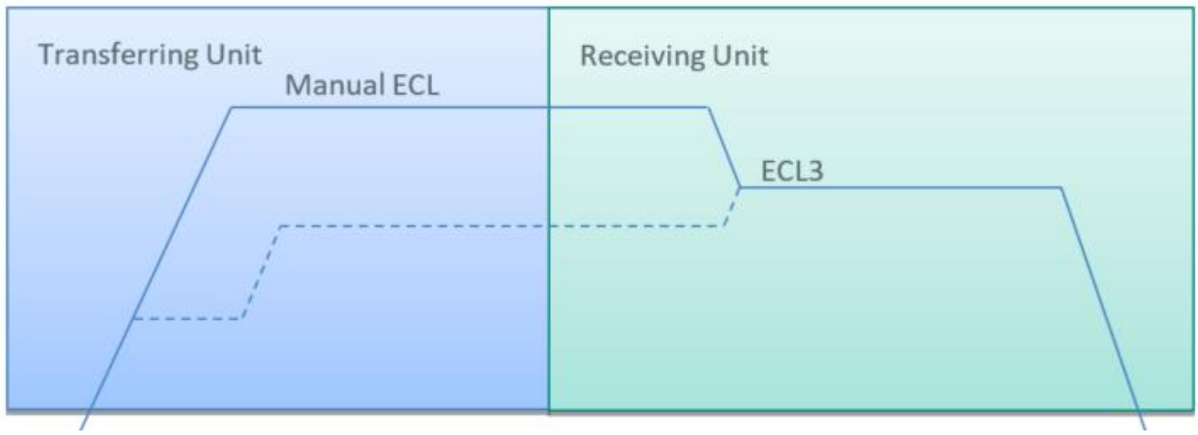


Figure 20: List of applicable vertical constraints after ECL input for the second flight

3.3.2.6.5.2.3 Operational Activity Description

The operating method is described below:

UC#0214			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring Unit system shares all the vertical constraints (ECL1, SC1 and SC2) for the Aircraft1 (refer to figure 1). FL1 is shared as ECL constraint to be applied at the defined level. SC1 and SC2 are shared as strategic constraints to be applied at or below the defined level.	S	FSMG.0009 FSMG.0017 FSMG.0092
2	The Transferring RE assumes Aircraft1 and enters a manual ECL which is below SC1 and above SC2.	O	

UC#0214			
Step	**Operating Method**	**V&V**	**Requirement**
3	The Transferring Unit system propagates the ECL into the Receiving Unit. SC2 is maintained and constrains the trajectory.	S	FSMG.0065
4	The Transferring Unit shares the remaining applicable constraints (refer to figure 3).	S	FSMG.0001
5	Transferring (or Receiving) Unit adapts the coordination data (TFL) to this new En-route Cruise Level, if needed.	S	COTR.0028
6	For Aircraft2, the three levels are shared as ECL constraints to be applied at the defined level. The Transferring Unit system shares all the vertical constraints (ECL1, ECL2 and ECL3) (refer to figure 2).	S	FSMG.0009 FSMG.0017 FSMG.0092
7	The Transferring RE assumes Aircraft2 and enters a manual ECL above ECL1, ECL2 and ECL3.	O	
8	In this example, according to the local rules of the Transferring Unit system, the new ECL overrides both ECL1 and ECL2. The new ECL is propagated until ECL3.	S	FSMG.0065
9	The Transferring Unit shares the remaining applicable constraints (refer to figure 4).	S	FSMG.0001
10	Transferring (or Receiving) Unit adapts the coordination data (TFL) to this new En-route Cruise Level, if needed.	S	COTR.0028

Table 69: En route cruising level management

3.3.2.6.5.3 UC#0224: Management of holding & stay constraint

This use case describes the process by which a holding and a stay are taken into account in the Trajectory computation.

3.3.2.6.5.3.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.

Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.5.3.2 Preconditions

1. There is no skipped or No_Contact RE between the Transferring and the Receiving RE.
2. Neither the Transferring nor the Receiving RE is a Delegatee.
3. The Transferring RE is controlling the Aircraft.
4. In Sub-UC 1, the Level change in the holding has no impact on the TFL between the two REs.

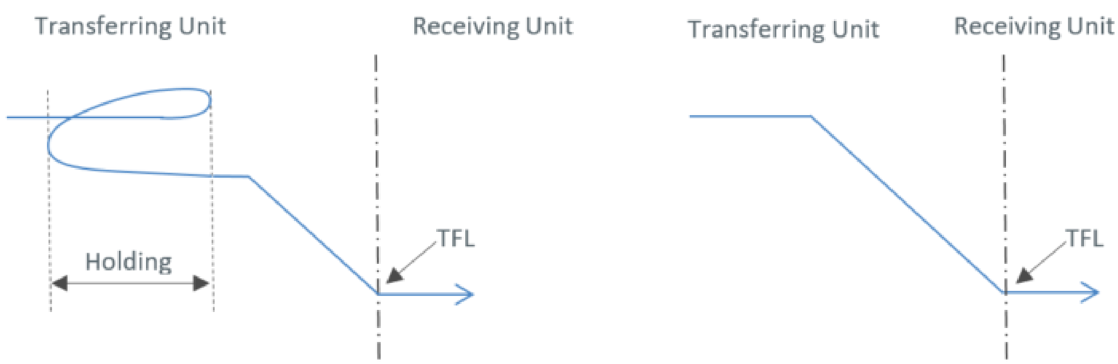


Figure 21: UC#0224 Illustration

3.3.2.6.5.3.3 Assumptions

1. The boundary between the Transferring RE and the Receiving RE is in SAP.

   Should the boundary between the Transferring RE and the Receiving RE be in CAP or NP, the UC remain valid.

3.3.2.6.5.3.4 Operational Activity Description

Sub-UC 1: Management of a holding constraint

UC#0224-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	For any operational reason, the Receiving RE coordinates by phone with the Transferring RE the need to delay the Aircraft by 4 minutes before the transfer.	O	
2	The Transferring RE instructs the Aircraft to perform one holding pattern over the last navigation fix of his area of responsibility.	O	
3	The Transferring RE inputs in his system the addition of this holding pattern, indicating the delay (time to lose).	O	FSMG.0035
4	The IOP trajectory is recomputed taking into account this holding constraint. As a consequence, the times over this and subsequent fixes are updated with the delay.	S	FSMG.0053 FSMG.0001 FSMG.0002
5	The Transferring RE inputs in his system a level change inside the hold so the holding entry level of the flight does not equal its holding exit level.	O	FSMG.0053
6	The Flight data are shared with all IOP partners.	S	GENE.0001
7	The Receiving RE retrieves the updated Flight data and checks that the modified estimates are now compliant with his traffic situation.	O	

UC#0224-1			
Step	**Operating Method**	**V&V**	**Requirement**
8	The Receiving RE re-assesses the situation and decides the hold is no longer needed. Transferring RE is informed by phone and cancels the hold (clearance & system input).	O	
9	The Transferring RE removes the holding constraint (including the associated level change) and the trajectory is recomputed.	S	FSMG.0035 FSMG.0001 FSMG.0002
10	The Receiving RE retrieves the updated Flight data with updated estimates.	O	

Table 70: Operating Method for Management of a holding constraint

Sub-UC 2: Management of a Stay

The operating method is described below:

UC#0224-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	When the first Flight data are shared, they include the Stay as described in the filed FPL (identification, start point, end point, duration).	S	FSMG.0091
2	When the Aircraft flies over the start point, it enters the Stay as planned. The estimate over the boundary between the Transferring RE and the Receiving RE is based on the expected duration of the Stay.	S	
3	During the Stay, the Aircraft informs the Transferring RE that it will have finished its mission at a given time, earlier than expected.	O	
4	The Transferring RE inputs in his system the new expected exit time.	O	FSMG.0035 FSMG.0091
5	The Trajectory is recomputed and shared with modified estimates based on the updated exit time of the stay.	S	FSMG.0001 FSMG.0002
6	The Receiving RE retrieves the Flight data and updates his local view based on these modified estimates.	S	

Table 71: Operating Method for Change of Management of a Stay

3.3.2.6.5.4 UC#0226: Modification of IFR/VFR and OAT/GAT

3.3.2.6.5.4.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft-1: flight within AoR of Transferring RE, IFR and GAT, which is subject to change.
- Aircraft-2: flight within AoR of Transferring RE, IFR and GAT which is subject to change.

3.3.2.6.5.4.2 Preconditions

1. Aircraft-1 is IFR and GAT.A flight rule or flight type change (from IFR to VFR or GAT to OAT) does not exist in the flight plan.
2. Aircraft-2 is IFR and GAT. A flight rule or flight type change (from IFR to VFR or GAT to OAT) does not exist in the flight plan.

3.3.2.6.5.4.3 Assumptions

1. There is no No_Contact Unit between Transferring RE and Receiving RE.

If a No_Contact Unit exist between Transferring RE and Receiving RE, the use case remains valid.

2. The boundary between Transferring and Receiving Units is in CAP.

The boundary between units be in NP or SAP, the use case is valid.

3.3.2.6.5.4.4 Operational Activity Description

The operating method is described below:

Step	Operating Method	V&V	Requirement
1	While Aircraft-1 flying under the control of Transferring RE, expresses the intention of changing flight rule from IFR to VFR when over X point which is in Transferring RE AoR	O	
2	Transferring RE inputs this information to the local system and the information is shared.	O	FSMG.0025
3	While Aircraft-2 flying under the control of transferring RE, expresses the intention of changing flight type from GAT to OAT when over Y point which is in Receiving RE AoR.	O	
4	Transferring RE inputs this information to the local system and the information is shared.	O	FSMG.0026

Table 72**: Operating Method for changing of IFR/VFR and OAT/GAT**

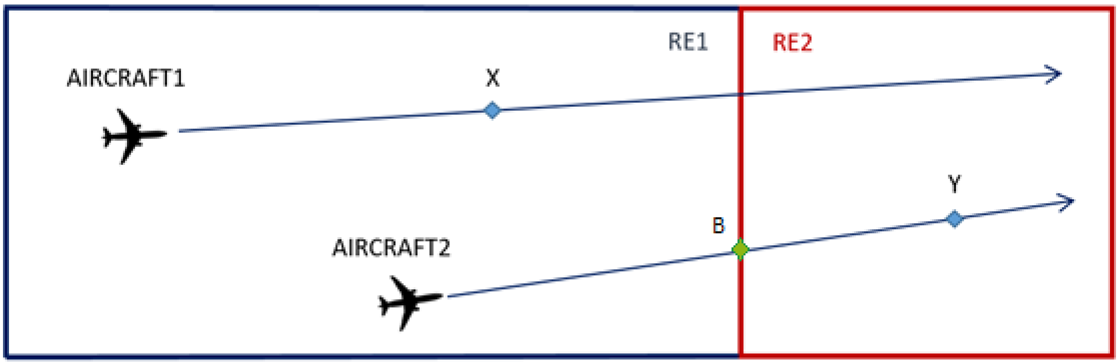


Figure 22: 2D routes showing X and Y points of change. RE1 –Transferring, RE2 –Receiving.

3.3.2.6.5.5 UC#0228: Level band clearance

3.3.2.6.5.5.1 Actors

- Controlling RE – The RE that has the control of the flight.
- Downstream RE – Any RE which is in the control sequence of the IOP trajectory or subscribed to related FO.
- Aircraft: The flight under the control of "controlling RE".

3.3.2.6.5.5.2 Preconditions

1. The flight is under control of the "controlling RE".

3.3.2.6.5.5.3 Assumptions

1. The aircraft is cruising at FL350

Even if the flight is cruising at a different flight level or in the climbing phase, the use case stays valid.

3.3.2.6.5.5.4 Operational Activity Description

The operating method is described below:

Step	Operating Method	V&V	Requirement
1	While the flight was cruising at FL350 in the controlling RE, for any reason, flying in block levels between FL340 and FL360 request is received from the flight deck.	O	
2	The request is accepted by controlling RE and block level clearance information has been input to the local system.	O	
3	The information is shared	O/S	FSMG.0037 FSMG.0017

Table 73: Operating Method for level band clearances

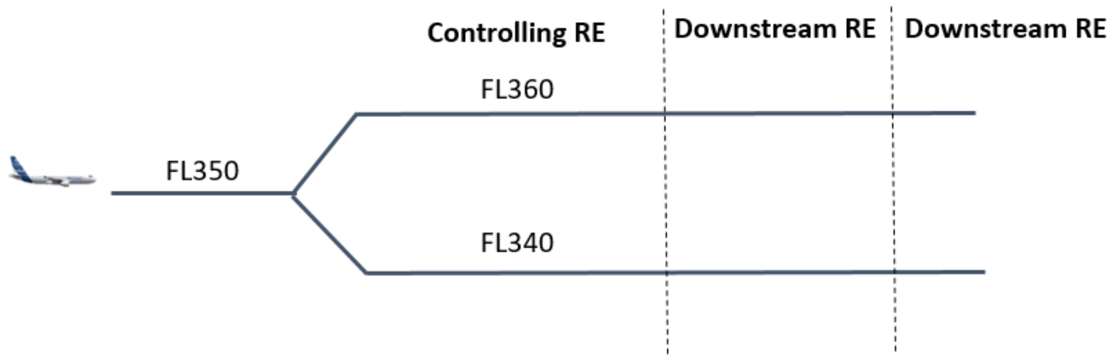


Figure 23: ***Share of block level information***

3.3.2.6.5.6 UC#0231: Closed Heading management

This use case describes the management of a closed heading executive constraint input by one ATCO and made available for use by IOP Units.

3.3.2.6.5.6.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.5.6.2 Preconditions

1. The Aircraft is assumed by the Transferring RE.

3.3.2.6.5.6.3 Assumptions

1. The coordination phase between the Transferring and the Receiving REs is already in CAP.

   Should the coordination phase between the Transferring and the Receiving Units be in SAP or NP, the UC remains valid (only a warning should inform the Receiving RE in case of non-negotiated vectoring in NP)

3.3.2.6.5.6.4 Operational Activity Description

The operating method is described below:

UC#0231			
Step	**Operating Method**	**V&V**	**Requirement**
1	Due to the needs of separation, the Transferring RE instructs to the Aircraft to fly on a specific heading and enters the input into the ground system defining graphically on its HMI a possible resume point (end of the vectoring) and a possible re-join point (point of the route to which the Aircraft will resume navigation).	O	COTR.0125
2	The Transferring Unit updates the Flight information with the tactical manoeuvre and re-computes the flight script and IOP trajectory.	S	FSMG.0001 FSMG.0002 FSMG.0034 FSMG.0049 FSMG.0107
3	The Receiving Unit retrieves the tactical manoeuvre through the updated Flight Information and the closed vectoring is made available to the Receiving RE.	S	GENE.0002

Table 74: Operating Method for sharing Closed Heading constraint

3.3.2.6.5.7 UC#0234: Management of active/inactive states of constraints

This use case describes the process by which the modification of a constraint influences the shared 4D trajectory and consequently, a coordination data (Transfer Flight Level).

3.3.2.6.5.7.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.5.7.2 Preconditions

1. Transferring and Receiving Units are in SAP.
2. The Aircraft is in departure phase. The current Transfer Flight Level (TFL1) has been set by the system according to the LoA, based on a military area which is active. This military area is linked to a published constraint known by Unit-A and Unit-B, who are eligible to modify it (activate/deactivate).
3. In Sub-UC2, the TFL is recomputed based on a LoA between the Transferring and the Receiving Units which intends to avoid the RE2 of the Transferring Unit.

3.3.2.6.5.7.3 *Assumptions*

1. The CAP has not yet been triggered between Transferring & Receiving Units.

   Should the CAP already be triggered, the REs might be informed of the TFL change based on the deactivation.

   Should the NP already be triggered, the TFL modification should be highlighted on the HMIs.

3.3.2.6.5.7.4 *Operational Activity Description*

Sub Use Case 1: Deactivation requires modifying the TFL as C&T data only

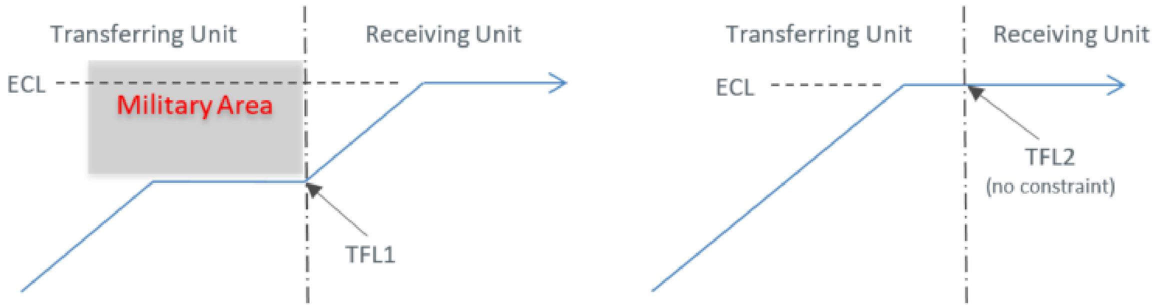


Figure 24: Deactivation requires modifying the TFL as C&T data only

The operating method is described below:

UC#0234-1			
Step	**Operating Method**	**V&V**	**Requirements**
1	The military area is deactivated.	O	
2	As Unit-A is eligible to modify this published constraint, it sets the constraint as 'inactive' into the system.	S	FSMG.0070
3	While re-computing the trajectory based on this new inactive constraint, Unit-A reassesses the other constraints and detects a change should be applied to the Transfer Flight Level.	S	
4	As the coordination phase between Transferring & Receiving Unit is not yet in CAP (so not yet in NP), the TFL can be modified by the system without negotiation.	S	
5	The Transferring Unit automatically modifies the TFL C&T Contractual data but as it doesn't model the trajectory (TFL=ECL), the Transferring Unit doesn't associate it to a constraint in the Flight Script.	S	COTR.0028
6	The predicted IOP trajectory is re-computed in order to satisfy the deactivated constraint.	S	FSMG.0002

UC#0234-1			
Step	**Operating Method**	**V&V**	**Requirements**
7	The Flight Object is updated and shared with: • the modified C&T data (TFL), • the modified Flight Script, • and the modified IOP Trajectory.	S	GENE.0001
8	The Receiving Unit: • receives the updated Flight Object, • retrieves the coordination data (TFL), • Compares the IOP Trajectory of the Flight Object with his internal computation.	S	FSMG.0076
9	Transferring and Receiving Units are now using the TFL corresponding to the situation of "deactivated MIL area", and the shared constraint (linked to the MIL area) is available in the FO with its "deactivated" status.	O	

Table 75: Operating Method for Constraint deactivation

Sub Use Case 2: Deactivation requires a TFL constraint

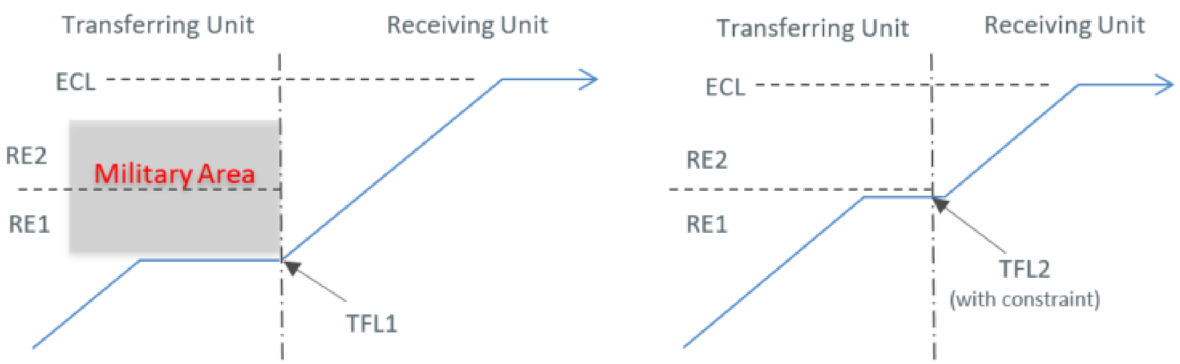


Figure 25: Deactivation requires a TFL constraint

The operating method is described below:

UC#0234-2			
Step	**Operating Method**	**V&V**	**Requirements**
1	The military area is deactivated.	O	
2	As the Transferring Unit is eligible to modify this published constraint, it sets the constraint as 'inactive' into the system.	S	FSMG.0070
3	While re-computing the trajectory based on this new inactive constraint, the Transferring Unit reassesses the other constraints and detects a change should be applied to the Transfer Flight Level.	S	
4	As the coordination phase between Transferring & Receiving Units is not yet in CAP (so not yet in NP), the TFL can be modified by the system without negotiation.	S	
5	The Transferring Unit automatically modifies the TFL C&T Contractual data and the constraint associated to this data in the Flight Script.	S	COTR.0028 FSMG.0104
6	As the Aircraft is in departure phase, the constraint associated to the TFL is automatically set by the upstream system as: • [At or Below], • Wall type of transition, • Target Start Point at the boundary (Relevant), • Closed.	S	FSMG.0017 FSMG.0060 FSMG.0062
7	The Transferring Unit inserts the two modified constraints into the Flight Script simultaneously (the deactivated constraint and the modified TFL).	S	

UC#0234-2			
Step	Operating Method	V&V	Requirements
8	The predicted IOP trajectory is re-computed in order to satisfy these two modified vertical constraints.	S	FSMG.0002
9	The Flight Object is updated and shared with: • the modified C&T data (TFL), • the modified Flight Script, • and the modified IOP Trajectory.	S	GENE.0001
10	The Receiving Unit system: • receives the updated Flight Object, • retrieves the coordination data (TFL), • Compares the IOP Trajectory of the Flight Object with his internal computation.	S	FSMG.0076
11	The Transferring and Receiving Units are now using the TFL corresponding to the situation of “deactivated MIL area”, and the shared constraint (linked to the MIL area) is available in the FO with its “deactivated” status.	O	

Table 76: Operating Method for Constraint deactivation

3.3.2.6.5.8 UC#0235: Management of Diversion (new destination airport)

This use case describes the management of a diversion of a flight to a new destination airport.

3.3.2.6.5.8.1 Actors

- IOP Units A, B and C, all adjacent, where A is the most upstream and B the most downstream IOP Unit.
    - In this UC, Unit-A is always the Transferring Unit.
    - Unit-B is the Receiving Unit until step 4
    - Unit-C becomes the Receiving Unit from step 5
- Aircraft – the flight which is requesting a diversion to a new destination airport.

3.3.2.6.5.8.2 Preconditions

1. The coordination phase between the Transferring and the first Receiving Unit is already in CAP.
2. The departure aerodrome is ADEP_1 in IOP Unit-A space
3. The destination aerodrome until step 4 is ADES_1 in IOP Unit-B space
4. The destination aerodrome since step 5 is ADES_2 in IOP Unit-C space
5. The route points are limited according to the IOP Route Expansion Scope

6. The reroute to the new ADES_2 since step 5 includes a modification of the crossed IOP Units.

3.3.2.6.5.8.3 Operational Activity Description

The operating method is described below:

UC#0235			
Step	**Operating Method**	**V&V**	**Requirement**
1	Due to whatever reason the flight is requesting a diversion to a new destination airport.	O	
2	The Transferring Unit acknowledges the request and assesses the impact.	O	
3	The Responsible Entity of the Transferring Unit updates the destination airport, modifies the trajectory to the new destination, indicates it is not yet cleared, and updates the Flight information with the new data.	S	FSMG.0074 FSMG.0105
4	The Transferring Unit modifies the control sequence and the distribution list according to the modified trajectory.		SEQM.0012 SEQM.0040
5	The Transferring Unit: • shares the updated Flight information with the new downstream Units, • shares the updated Flight information with the new IOP Units of the distribution list, • informs the IOP Units that are no longer crossed, • informs the IOP Units to which the Flight information will no longer be distributed.	S	SEQM.0096 SEQM.0088 SEQM.0006
6	The new downstream Units retrieve the new destination airport and modified trajectory in the updated Flight information.	S	
7	Once at least in SAP, the new downstream Units will then have the ability to modify, add or remove any constraint on the new trajectory to encompass their operational needs.	O/S	FSMG.0010

Table 77: Operating Method for Management of Diversion

3.3.2.6.5.9 UC#0240: Information Associated to By-passed Point.

This use case describes how IOP Units can share information that was associated to a point in field 15 when this point is removed from the route.

In this UC, the route field of the flight contains point B to which a specific switch is associated (change of speed level, IFR/VFR/, etc...). We refer to B as the "By-Passed Point".

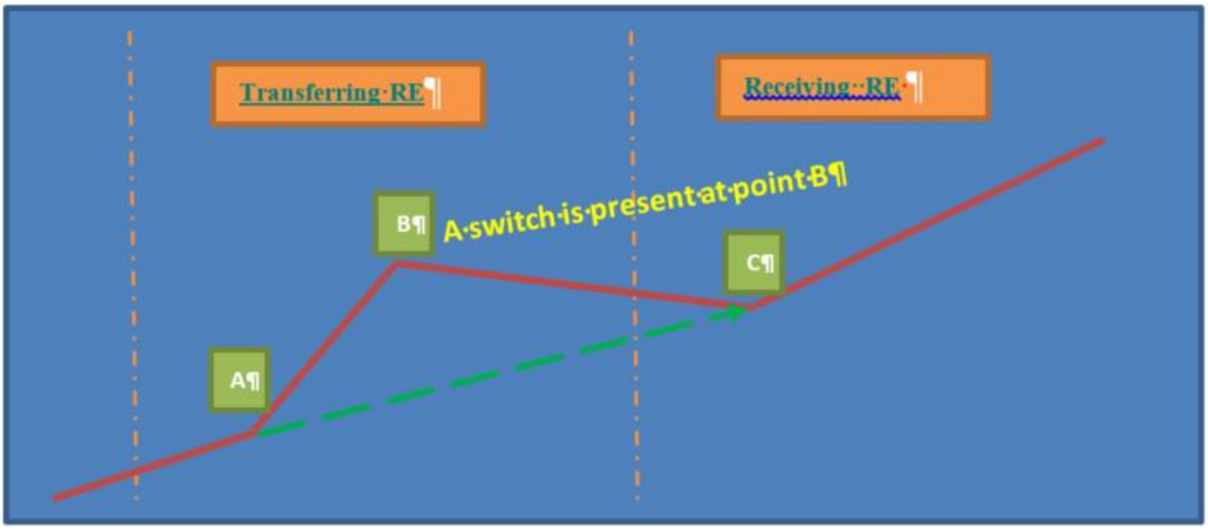


Figure 26: Information Associated to by-passed Point

The philosophy that is applied is that at IOP level, we minimize the rules specifying how these information should be transferred to the modified route. There is likely to be cross border agreements that will supersede any general rule that we could define (eg flying OAT in certain areas). Each originator will apply its own rules to decide how to transfer the indicator to the new route, possibly through manual intervention.

3.3.2.6.5.9.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE.

3.3.2.6.5.9.2 Precondition

1. Point B is part of the route of the Aircraft and bears a IFR/VFR OAT/GAT Speed/Level route switch or a STAY indicator.

3.3.2.6.5.9.3 Assumptions

1. The Transferring RE is controlling the Aircraft.

   Should the Aircraft be controlled by an upstream RE of the transferring RE, the UC would remain valid.

2. The boundary between the Transferring RE and the Receiving RE is in CAP.

   Should the boundary be in NP, the UC would remain valid.

3. The route amendment (here a direct) does not change the sequence of crossed REs.

Should the route amendment have an impact on the control sequence, please refer to UC#0210.

4. The route amendment (here a direct) encompasses a change of Flight Rule, OAG GAT, Speed/Level or a STAY indicator.
5. The route amendment is not electronically negotiated.

Should the route amendment be negotiated, please refer to UC#0132.

3.3.2.6.5.9.4 Operational Activity Description

Sub-UC 1 Change of Flight Rule

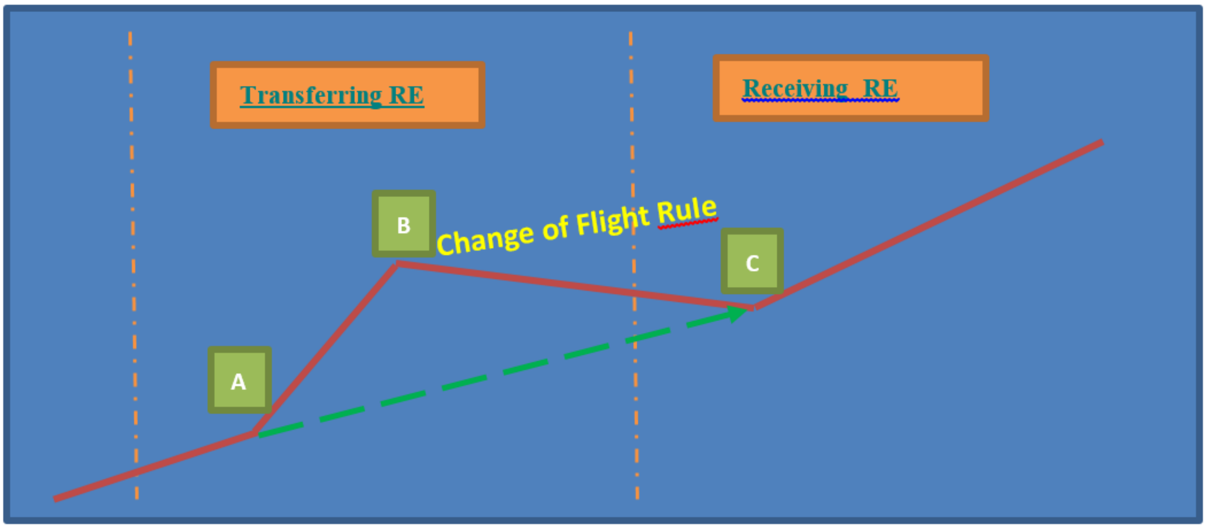


Figure 27: Change of Flight rule Information Associated to by-passed Point

The operating method is described below:

UC#0240-1 Change of Flight Rule			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring and the Receiving REs verbally coordinate a direct course of the Aircraft from A to C.	O	
2	The Transferring RE performs the route change with a Direct input, bypassing a point that contained a Flight Rules change (VFR).	O	COTR.0212
3	The Transferring RE will update the route including information pertaining to the flight rule change: • The VFR indicator might be removed • It might be shifted to a point before or after or a new point inserted on the DIRECT segment • It might be flagged as planned on the [A,C] segment (without precising an exact location)	S	FSMG.0120 COTR.0125 COTR.0212

UC#0240-1 Change of Flight Rule			
Step	**Operating Method**	**V&V**	**Requirement**
4	The Receiving Unit retrieves the modified route and displays the appropriate information to the concerned RE In case of disagreement on the eligibility of the route change it may desynchronize	S	Local requirement FSMG.0120 FSMG.0076

Table 78: Sub-UC 1 operating method

Sub-UC 2 Speed Level group

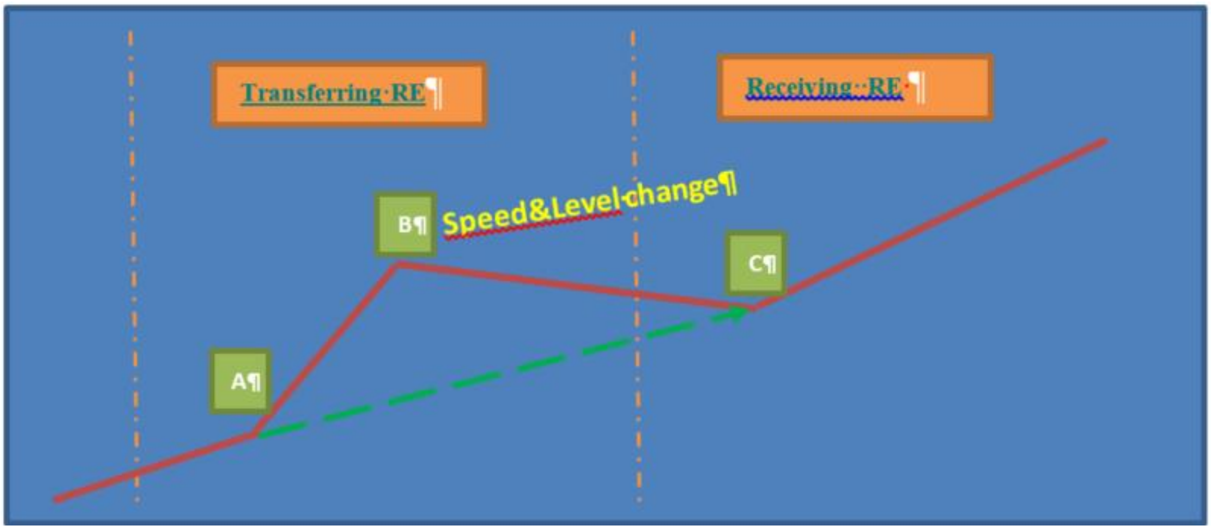


Figure 28: Speed&Level change Information Associated to by-passed Point

UC#0240-2 Speed Level group			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring and the Receiving REs verbally coordinate a direct course of the Aircraft from A to C.	O	
2	The Transferring RE performs the route change with a Direct input, bypassing a point that contained a speed level group	O	COTR.0212
3	The Transferring RE will update the route including information pertaining to the speed level group : • The speed level change might be removed • It might be shifted to a point before or after or a new point inserted on the DIRECT segment • It might be flagged as planned on the [A,C] segment without precising an exact location It computes an updated trajectory aligned with the option selected.	S	FSMG.0121 COTR.0125 COTR.0212

UC#0240-2 Speed Level group			
Step	**Operating Method**	**V&V**	**Requirement**
4	The Receiving Unit retrieves the modified route and displays the appropriate information to the concerned RE In case of disagreement on the eligibility of the route change it may desynchronize	S	Local requirement FSMG.0121 FSMG.0076

Table 79: Sub-UC 2 operating method

Sub-UC 3 OAT GAT change

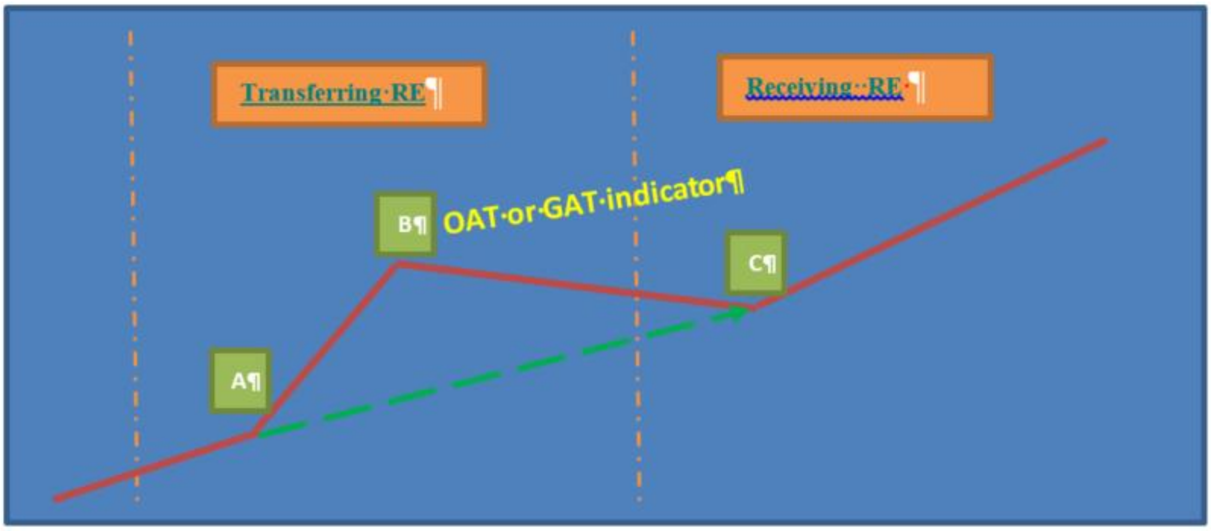


Figure 29: OAT/GAT indicator Information Associated to by-passed Point

UC#0240-3 OAT GAT change			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring and the Receiving REs verbally coordinate a direct course of the Aircraft from A to C.	O	
2	The Transferring RE performs the route change with a Direct input, by passing a point that contained an OAT or GAT indicator	O	COTR.0212
3	The Transferring RE will update the route including information pertaining to the OAT GAT change: • The change might be removed • It might be shifted to a point before or after or a new point inserted on the DIRECT segment • It might be flagged as planned on the [A,C] segment (without precising an exact location)	S	COTR.0125 COTR.0212 FSMG.0122

UC#0240-3 OAT GAT change			
Step	Operating Method	V&V	Requirement
4	The Receiving Unit retrieves the modified route and displays the appropriate information to the concerned RE In case of disagreement on the eligibility of the route change it may desynchronize	S	Local requirement FSMG.0122 FSMG.0076

Table 80: Sub-UC 3 operating method

Sub-UC 4 STAY indicator

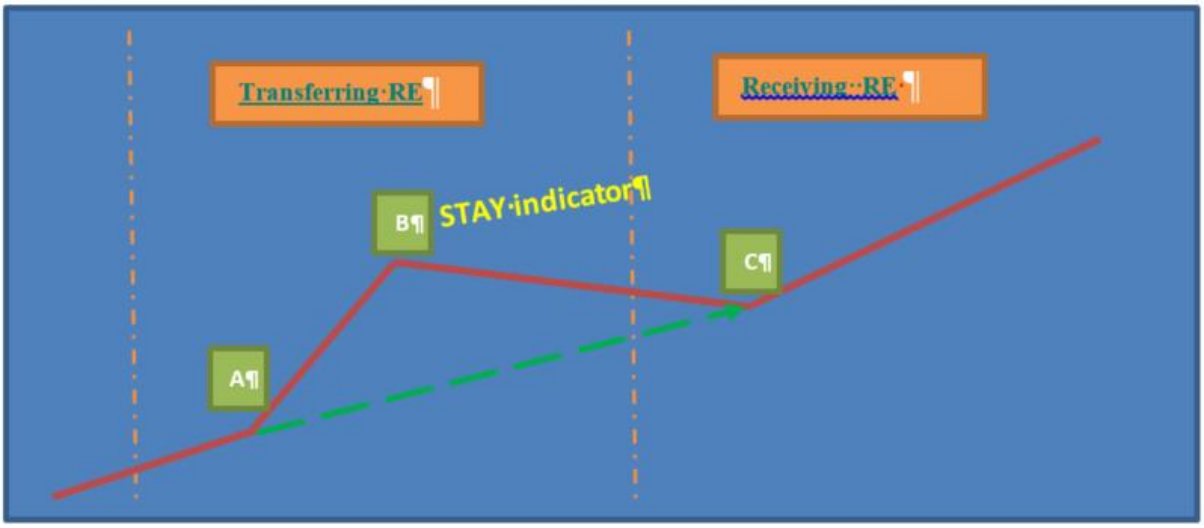


Figure 30: STAY indicator Information Associated to by-passed Point

UC#0240-4 STAY indicator			
Step	Operating Method	V&V	Requirement
1	The Transferring and the Receiving REs verbally coordinate a direct course of the Aircraft from A to C.	O	
2	The Transferring RE performs the route change with a Direct input, bypassing a point that was associated to a STAY indicator	O	COTR.0212
3	The Transferring RE will update the route including information pertaining to the STAY indicator: • The indicator might be removed • It might be shifted to a point before or after or a new point inserted on the DIRECT segment • It might be flagged as planned on the [A,C] segment (without precising an exact location)	S	COTR.0125 COTR.0212 FSMG.0123

UC#0240-4 STAY indicator			
Step	**Operating Method**	**V&V**	**Requirement**
4	The Receiving Unit retrieves the modified route and updates its own information In case of disagreement on the eligibility of the route change it may desynchronize	S	Local requirement FSMG.0123 FSMG.0076

Table 81: Sub UC 4 operating method

3.3.2.6.5.10 UC#0243: Sharing of Executive Constraints (CFL, DCT, Speed, Heading, Rate)

This use case describes the management of an executive constraint input by one ATCO and made available for use by IOP Units.

3.3.2.6.5.10.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.5.10.2 Preconditions

1. The Aircraft is assumed by the Transferring Unit.
2. The coordination phase between the Transferring and the Receiving Units is already in CAP.
3. The clearance given to the Aircraft is considered as an open executive constraint which has no impact on the IOP trajectory.

3.3.2.6.5.10.3 Operational Activity Description

The operating method is described below:

UC#0243			
Step	**Operating Method**	**V&V**	**Requirement**
1	Due to the needs of separation, sequencing or coordination the Unit instructs one of the following short term tactical instructions to the Aircraft and enters the input in to the ground system. • Cleared flight level or • DCT or • Speed Instruction [at] or • Aircraft heading or • Rate of climb/descent [at].	O	FSMG.0034 FSMG.0035
2	The Transferring Unit assesses the impact of the clearance on the flight script and, if any, re-computes it.	S	FSMG.0017 FSMG.0019 FSMG.0060
3	The Unit system updates the Flight Object with the tactical manoeuvre and the consequences.	S	FSMG.0001 FSMG.0049
4	The Receiving Units retrieve the tactical manoeuvre through the updated Flight Object.	S	GENE.0002
5	Depending on the local implementation any Receiving Unit may advise the controlling team and/or update their local trajectory.	O	

Table 82: Operating Method for sharing Executive Constraints

3.3.2.6.5.11 UC#0244: Route amendment inside a downstream airspace

This use case describes a route amendment that is received by and updated at an upstream IOP Unit but that affects IOP unit(s) downstream only.

3.3.2.6.5.11.1 Actors

- **Unit-A:** first of the three successive IOP Units crossed by the Aircraft's trajectory.
- **Unit-B:** second of the three successive IOP Units crossed by the Aircraft's trajectory.
- **Unit-C:** third of the three successive IOP Units crossed by the Aircraft's trajectory.
- RE-A, RE-B, RE-C – The Responsible Entities respectively defined by Units A, B and C.
- **Aircraft:** the flight which is going to cross the airspace of Units A, B and C.

3.3.2.6.5.11.2 Preconditions and Assumptions

1. The Aircraft, currently in Unit-A airspace, is crossing three IOP units in the following order: A-B-C
2. The original route of the Aircraft is P-Q-R-S-T-U-V, the amended route will be P-Q-R-T-U-V.
3. Unit-A is controlling the Aircraft.
4. The route shortcut provides more than 1 minute benefit so that Unit-C can check the implementation of the change.

3.3.2.6.5.11.3 Assumptions

1. The boundary between Unit-A and Unit-B is in CAP.

   Should the boundary between Unit-A and Unit-B not be in CAP, the UC would apply with no restriction.

2. The boundary between Unit-B and Unit-C is in SAP.

   Should the boundary between Unit-B and C be in CAP or NP, Unit-C's RE might be made aware of the change thanks to any local mechanism (highlight, pop-up…).

3. The re-route does not change the sequence of downstream units crossed by the trajectory, neither the concerned sectors in the downstream units beyond the route amendment.

   Should the route amendment have an impact on the control sequence, please refer to UC#0210.

4. The route amendment performed by Unit-B is not negotiated with any other Unit.

   Should the route amendment be negotiated, please refer to UC#0132.

5. The route amendment is a Direct (one or several points are removed, no new point is added).

   Should the route amendment be more complex than a Direct (with new points inserted), step 1 would refer to requirement FSMG.0047*instead of requirement*FSMG.0046*.*

6. No constraint or information has to be transferred from the [R-S-T] segment to the new route.

   Should a constraint or information be transferred from the [R-S-T] segment to the new route, requirement FSMG.0066*would have to be taken into account in step 2.*

7. Unit-B is the one clearing the modified segment to the Aircraft.

   Should it be done by Unit-A, Step 6 would be for Unit-A instead of Unit-B.

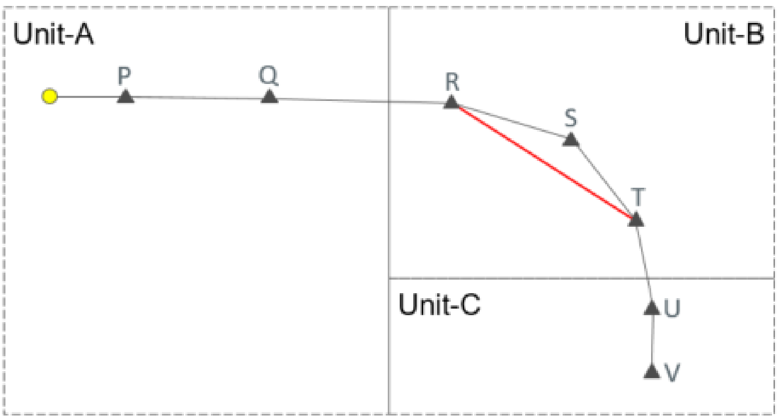


Figure 31: Route amendment inside a downstream airspace

3.3.2.6.5.11.4 Operational Activity Description

The operating method is described below:

UC#0244			
Step	**Operating Method**	**V&V**	**Requirement**
1	RE-B inputs a shortened route for the aircraft through his HMI.	O	FSMG.0046 FSMG.0048
2	The flight script is recomputed and the flight information is updated with the re-route P-Q-R-T-U-V and shared with all partners.	S	FSMG.0001
3	As the new R-T segment of the route has not yet been cleared to the Aircraft, this segment is flagged as 'uncleared'.	S	FSMG.0105
4	The system of Unit-C retrieves all modified information and is able to make its RE aware of the change.	O/S	GENE.0002
5	As it is aware that the R-T segment is not known by the Aircraft, as soon as RE-B controls the Aircraft, it clears the modified route to the Aircraft.	O	
6	Unit-B removes the 'uncleared' flag on the R-T segment of the route.	S	

Table 83: Operating Method for an internal re-routeing

3.3.2.6.5.12 UC#0245: Transfer of a constraint impacted by a route change

This use case describes how an agreed constraint (a change in the RFL) that has been applied to the trajectory of a flight is affected when a route change implies that the original constraint point is no longer expected on the flight's new route.

3.3.2.6.5.12.1 Actors

- **Unit-A:** first of the three successive IOP Units crossed by the Aircraft's trajectory.
- **Unit-B:** second of the three successive IOP Units crossed by the Aircraft's trajectory.
- **Unit-C:** third of the three successive IOP Units crossed by the Aircraft's trajectory.
- RE-A, RE-B, RE-C – The Responsible Entities respectively defined by Units A, B and C.
- **Aircraft:** the flight which is going to cross the airspace of Units A, B and C.

3.3.2.6.5.12.2 Preconditions

1. The Aircraft is crossing three IOP units in the following order: A-B-C
2. The original route of the Aircraft is P-Q-R-S-T-U-V, the amended route will be P-Q-R-T-U-V.
3. RE-A is controlling the Aircraft.
4. The RFL of the Aircraft has a planned change at point S.
5. The re-route implies that the amended position of the constraint remains within the airspace that is the responsibility of Unit-B.

3.3.2.6.5.12.3 Assumptions

1. The boundary between Unit-A and Unit-B is in CAP.

   Should the boundary between Unit-A and Unit-B not be in CAP, the UC would apply with no restriction.

2. The boundary between Unit-B and Unit-C is not yet in CAP.

   Should the boundary between Unit-B and C be in CAP, Unit-C's RE might be made aware of the change thanks to any local mechanism (highlight, pop-up…).

   The boundary between Unit-B and C being in NP is considered abnormal.

3. The re-route does not change the sequence of downstream units crossed by the trajectory, neither the concerned sectors in the downstream units beyond the route amendment.

   Should the route amendment have an impact on the control sequence, please refer to UC#0210.

4. The route amendment performed by Unit-B is not negotiated with any other Unit.

   Should the route amendment be negotiated, please refer to UC#0132.

5. The route amendment is a Direct (one or several points are removed, no new point is added).

   Should the route amendment be more complex than a Direct (with new points inserted), step 1 would refer to requirement FSMG.0047 *instead of requirement*FSMG.0046.

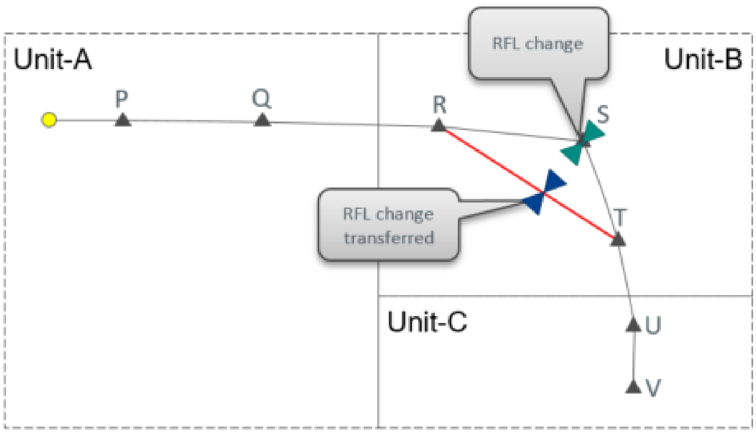


Figure 32: Transfer of a constraint impacted by a route change

3.3.2.6.5.12.4 Operational Activity Description

The operating method is described below:

UC#0245			
Step	**Operating Method**	**V&V**	**Requirement**
1	RE-B inputs a shortened route for the aircraft through his HMI.	O	FSMG.0046 FSMG.0048
2	The flight script is recomputed including the new position of the constraint (the RFL change to FL370), e.g. by calculating an abeam position on the new route. The flight information is updated with the re-route P-Q-R-T-U-V and shared with all partners.	S	FSMG.0001 FSMG.0066
3	The Units receiving the updated flight script assess the impact of the modification of the application of the constraint and react accordingly (e.g. removes it, reposition it…).	S	FSMG.0066
4	The system of Unit-C retrieves all modified information and is able to make its RE aware of the change.	O/S	GENE.0002

Table 84: Operating Method for a Transfer of a constraint impacted by a route change

3.3.2.6.6 IOP TRAJECTORY MANAGEMENT USE CASES

3.3.2.6.6.1 UC#0210: Modification of 2D Route

This use case describes the operational process of a DIRECT input and the accompanying modification of the list of crossed IOP Units.

3.3.2.6.6.1.1 Actors

- Units A, B and C, all adjacent IOP Units, where A is the most upstream and B the most downstream.
  - In this UC, Unit-A is always the Transferring Unit.
  - In sub-UC1, Unit B becomes the Receiving Unit from step 4.
  - In sub-UC2, Unit C becomes the Receiving Unit from step 4.
- RE-A, RE-B, RE-C are the Responsible Entities respectively defined by Units A, B and C.
- Aircraft – the flight which is to be transferred from the Unit-A to Unit-B or Unit-C.

3.3.2.6.6.1.2 Preconditions

1. Cruising flight, no level change.
2. The DIRECT does not create a non-standard coordination.
3. All traversed IOP Units are in CAP.
4. Unit-A is the controlling IOP Unit.

3.3.2.6.6.1.3 Assumptions

1. No other constraint is impacted by the DIRECT input.

If there is one of the constraints or information listed in the requirement FSMG.0066*on the portion of the route replaced by the Direct course, this information shall be transferred to the new portion of route in compliance with this requirement.*

2. In Sub-UC1, the new trajectory no longer crosses Unit-C airspace but still crosses Unit-C Area of Interest.

   Should Unit-C Area of Interest no longer be crossed, steps 8 & 12 would not apply for Unit-C.

3.3.2.6.6.1.4 Operational Activity Description

The Use Case is divided into two sub-use-cases:

Sub-UC 1: DIRECT input that removes an IOP Unit

Sub-UC 2: DIRECT input that adds an IOP Unit

The operating method is described below:

Sub-UC 1:

RE-A inputs a DIRECT which removes IOP Unit-C from the list of crossed IOP Units.

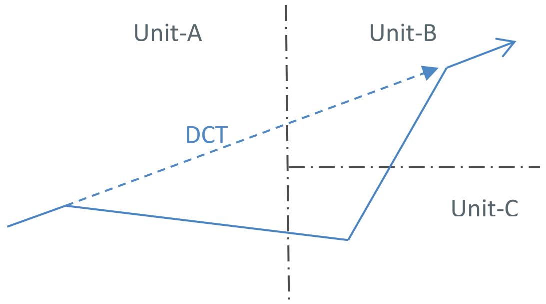


Figure 33: UC#0210 Sub-UC-1 Flight leg presentation

UC#0210-1			
Step	**Operating Method**	**V&V**	**Requirements**
1	RE-A clears the Aircraft for the Direct course and performs the system input (2D route).	O	FSMG.0046
2	Unit-A modifies the trajectory (which technically means: Unit-A modifies the expanded route of the Flight Script and the IOP trajectory recomputed accordingly).	S	COTR.0125
3	Unit-A reassesses the list of crossed IOP Units and removes Unit-C from this list	S	SEQM.0012
4	Unit-A modifies the control sequence	S	SEQM.0040
5	The CAP or NP is triggered for the boundary between Unit-A and Unit-B according to the Letter of Agreement between them.	S	COTR.0007
6	Unit-A fills in the new coordination data between Unit-A & B	S	COTR.0028 COTR.0030

UC#0210-1			
Step	**Operating Method**	**V&V**	**Requirements**
7	Unit-A distributes the updated FO	S	
8	Unit-B & C receive the updated FO	S	SEQM.0011
9	Unit-B synchronizes the FO with its internal system flight plan	S	FSMG.0076
10	Unit-B reassesses and completes the coordination data between A & B if necessary (e.g. in case of missing information)	S	COTR.0028
11	RE-B should be informed of the modification (local implementation, e.g. highlight)	O	
12	RE-C should be informed of the fact he's no longer crossed (local implementation)	O	SEQM.0096

Table 85: Operating Method for DIRECT modifying the sequence of IOP Units 1

Sub-UC 2:

RE-A inputs a DIRECT which adds Unit-C in the list of crossed IOP Units, between Unit-A and Unit-B.

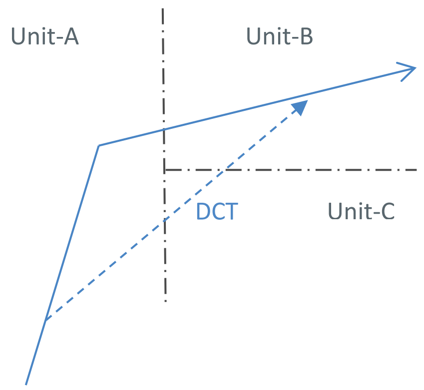


Figure 34: UC#0210 Sub-UC-2 Flight leg presentation

UC#0210-2			
Step	**Operating Method**	**V&V**	**Requirements**
1	RE-A clears the Aircraft for the Direct course and performs the system input (2D route)	O	

UC#0210-2			
Step	**Operating Method**	**V&V**	**Requirements**
2	Unit-A modifies the trajectory (which technically means: Unit-A modifies the expanded route of the Flight Script and the IOP trajectory recomputed accordingly).	S	COTR.0125
3	Unit-A reassesses the list of crossed IOP Units and adds Unit-C to the list	S	SEQM.0012
4	Unit-A modifies the control sequence	S	SEQM.0040
5	The CAP or NP is triggered for the boundary between Unit-A and Unit-C and between Unit-C and Unit-B according to the Letter of Agreement between each of them.	S	COTR.0007
6	Unit-A fills in the new coordination data between Unit-A & C and available coordination data between Unit-C & B	S	COTR.0028 COTR.0030
7	Unit-A distributes the updated FO	S	
8	Unit-B & C receive the updated FO	S	SEQM.0011
9	Unit-B & C synchronize the FO with their internal system flight plan	S	FSMG.0076
10	Unit-B & C reassess and complete the coordination data between A & C and C & B	S	COTR.0028
11	RE-B & RE-C should be informed of the modification (local implementation, e.g. highlight)	O	

Table 86: Operating Method for DIRECT modifying the sequence of IOP Units 2

3.3.2.6.7 IOP UNIT'S CONTROL SEQUENCE USE CASES

3.3.2.6.7.1 UC#0133 Force-assume from a skipped Unit

This use case describes the process by which a flight is force assumed by the skipped RE before the controlling RE of its upstream IOP Unit has performed the frequency change input in the system.

3.3.2.6.7.1.1 Actors

- Unit-A – the first of the three successive IOP Units in the control sequence, expected to transfer the flight directly to Unit-C before Unit-B force-assumes it
- Unit-B – the second of the three successive IOP Units in the control sequence, skipped until it force-assumes the flight.
- Unit-C – the third of the three successive IOP Units in the control sequence that was expected to receive the flight from Unit-A before Unit-B force-assumes it.
- RE-A, RE-B, RE-C – The Responsible Entities respectively defined by Units A, B and C.
- Aircraft – the flight expected to be transferred from the Unit-A to the Unit-C before Unit-B force-assumes it.

3.3.2.6.7.1.2 Precondition

1. Unit-B is skipped.

3.3.2.6.7.1.3 Assumptions

1. Unit-B is skipped in favour of the upstream.

   Should Unit-B be skipped in favour of the downstream, the UC would remain valid.

2. There's only one crossed RE in Unit-B.

   Should there be several REs in Unit-B, please refer to UC#0506.

3. The coordination phase between the Unit-A and Unit-C is CAP and this information is included in the FO. RE-A and RE-C are officially aware of the Aircraft.

   Should the coordination between Unit-A and Unit-C be in the Negotiation Phase, the UC would still be valid.

   Should the coordination between Unit-A and Unit-C not yet be in the Controller Awareness Phase, the UC would still be valid.

4. The frequency change input from the Unit-A did not occur yet. The aircraft may have been verbally instructed to contact Unit-B and may have done it despite the RE-A didn't make the input on its HMI.

   This UC is also valid in case of erroneous Force-assumption by the Unit-B without verbal frequency change instruction.

5. There's no CPDLC connection.

   Should a CPDLC connection exist between the Aircraft and the Unit-A, the CPDLC End message would not be sent to the Aircraft by Unit-A until the Stolen information is acknowledged by Unit-A in order to avoid useless CPDLC connections in case of erroneous force-assumption followed by a corrective assumption from Unit-A.

3.3.2.6.7.1.4 Operational Activity Description

The operating method is described below:

UC#0133			
Step	**Operating Method**	**V&V**	**Requirement**
1	The RE-B force assumes the Aircraft.	O	COTR.0216
2	As it was skipped, the Unit-B is automatically unskipped and the control sequence is modified.		SEQM.0002 SEQM.0050
3	The Stolen information is shared.	S	

UC#0133			
Step	**Operating Method**	**V&V**	**Requirement**
4	RE-A (previously controlling) and RE-B (currently controlling) shall be notified that the Aircraft has been stolen.	O	COTR.0052
5	Unit-A acknowledges the Stolen information (meaning he agrees with the stealing) with an input into the system.	O/S	COTR.0053
6	The acknowledgement of the stolen information should be indicated on both Unit-A & Unit-B HMIs.	O	COTR.0110

Table 87: Operating Method for Force-assume from a skipped Unit

3.3.2.6.7.2 UC#0501: Automatic Skip of an IOP Unit in favour of the upstream

This use case describes the process by which an IOP Unit is automatically skipped, the aircraft being controlled by its upstream IOP Unit in its airspace.

3.3.2.6.7.2.1 Actors

- Unit-A – the first of the three successive IOP Units in the control sequence, expected to transfer the flight directly to Unit-C once the skip of Unit-B will be implemented.
- Unit-B – the second of the three successive IOP Units in the control sequence that is expected to be skipped.
- Unit-C – the third of the three successive IOP Units in the control sequence that is expected to receive the flight from the Unit-A once the skip of Unit-B will be implemented.
- Aircraft – the flight which is to be transferred from the Unit-A to the Unit-C once the skip of Unit-B will be implemented.

3.3.2.6.7.2.2 Preconditions

1. There's a Letter of Agreement between Unit-A & Unit-B allowing the automatic Skip of Unit-B in favour of Unit-A.
2. Unit-A is at least in System Awareness Phase (SAP).

3.3.2.6.7.2.3 Assumptions

1. Unit-B is skipped in favour of the upstream which means the Aircraft will be controlled in Unit-B airspace by Unit-A.

   Should Unit-B be skipped in favour of the downstream, which means the Aircraft would be controlled in Unit-B airspace by Unit-C, please refer to UC#0514.

2. When Unit-B enters into SAP, it assesses the situation and agrees with the automatic skip performed by Unit-A.

   Should Unit-B disagree with the automatic skip when entering the SAP, or even later, then Unit-B would unskip himself as described in UC#0503.

3. Unit-C is not yet in SAP and will enter in SAP after Unit-B.

   Should Unit-C enter into SAP before Unit-B, then the data provided in Step 6 would be provided earlier.

4. Based on the Letter of Agreement, all crossed RE of Unit-B are automatically skipped as a group.

    The situation where the Unit-B crossed RE are not skipped as a group, is described in UC#0506, UC#0507 and UC#0504.

3.3.2.6.7.2.4 Operational Activity Description

The operating method is described below:

UC#0501			
Step	**Operating Method**	**V&V**	**Requirement**
1	Unit-A detects that the IOP Trajectory is compliant with the conditions expressed in the Letter of Agreement in order to skip Unit-B in favour of the upstream.	S	GENE.0004 SEQM.0001 SEQM.0094
2	Unit-A modifies the control sequence indicating that Unit-B is now skipped in favour of the upstream.	S	
3	When Unit-A makes the flight data available to its RE, ATCOs are aware that Unit-B is skipped, that they will be in charge of the Aircraft inside Unit-B airspace, and that they will have to transfer the Aircraft directly to Unit-C. Based on the LoA, Unit-B provides: • the skipped RE identification • the skipped RE's frequency • the identification of the RE granted by the skipped RE • the Release provided by the skipped RE.	O	COTR.0110 COTR.0109
4	When Unit-B enters in SAP, it assesses the situation and, as it agrees with the skip, doesn't change the control sequence and synchronizes its local view.	S	GENE.0004
5	When Unit-B makes the flight data available to its REs, ATCOs are aware that they are skipped and will not get the aircraft on frequency.	O	COTR.0110
6	When Unit-C enters into SAP, it provides the required C&T data for his upstream boundary (as well as for his downstream boundary if it exists).	S	GENE.0004
7	When Unit-C makes the flight data available to its REs, they are aware that the Aircraft will be transferred by Unit-A.	O	COTR.0109

Table 88: Operating Method for automatic Skip of an IOP Unit in favour of the upstream

3.3.2.6.7.3 UC#0503: Manual Unskip of an IOP Unit skipped in favour of the upstream.

For Skip definition, see INTEROP §3.2.4.1.4.1.

3.3.2.6.7.3.1 Actors

- Unit-A – the first of the three successive IOP Units in the control sequence, expected to transfer the flight directly to Unit-C before Unit-B unskips.
- Unit-B – the second of the three successive IOP Units in the control sequence, skipped until it unskips.
- Unit-C – the third of the three successive IOP Units in the control sequence that was expected to receive the flight from Unit-A before Unit-B unskips.
- RE-A, RE-B, RE-C – The Responsible Entities respectively defined by Units A, B and C.
- Aircraft – the flight expected to be transferred from the Unit-A to the Unit-C before Unit-B assumes it.

3.3.2.6.7.3.2 Assumptions

1. The aircraft is within Unit-A area of responsibility, under its control.

   Should a further upstream Unit control the Aircraft, this use-case would apply with no restriction.

2. Only one RE of Unit-B is crossed.

   Should several REs of Unit-B be crossed but not all of them skipped, please refer to UC#0506 & #0507.

3. Unit-B status is fully skipped in favour of the upstream, this means that Unit-A is the Unit expected to control the Aircraft in B's airspace.

   Should Unit-B be skipped in favour of the downstream (Unit-C being the one expected to manage the Aircraft in B's airspace), in step 3, Unit-A would be replaced by Unit-C.

4. Before the Unskip, the coordination phase between Unit-B and Unit-C (operationally between Unit-A and Unit-C) is in CAP.

   Should the coordination phase be in SAP, this use-case would apply with no restriction.

   Should the coordination phase be in NP, the UNSKIP information (or the modified Receiving frequency & RE ID) might be highlighted on Unit-A & C's HMI according to local decision.

5. The UNSKIP is performed by Unit-B.

   *Should the UNSKIP instead be performed by Unit-A, step 1 becomes: "RE-A detects that the Aircraft has a potential conflict in Unit-B's airspace and unskips Unit-B" and the associated requirement becomes*SEQM.0080*. Should the skip be undone through a change of frequency input then* SEQM.0048*applies.*

   *In case of Unit-B being skipped in favour of the downstream, should the UNSKIP instead be performed by Unit-C, step 1 becomes: "RE-C detects that the Aircraft has a potential conflict in Unit-B's airspace and unskips Unit-B" and the associated requirement becomes*SEQM.0080*.*

6. In step 1, the UNSKIP performed by Unit-B is a manual input of UNSKIP. UNSKIP can also be triggered by a Force-Assume.

*Step 1 would then be: "As the Aircraft contacted Unit-B, this unit force-assumes the Aircraft which unskips Unit-B". The associated requirement would be*SEQM.0050.

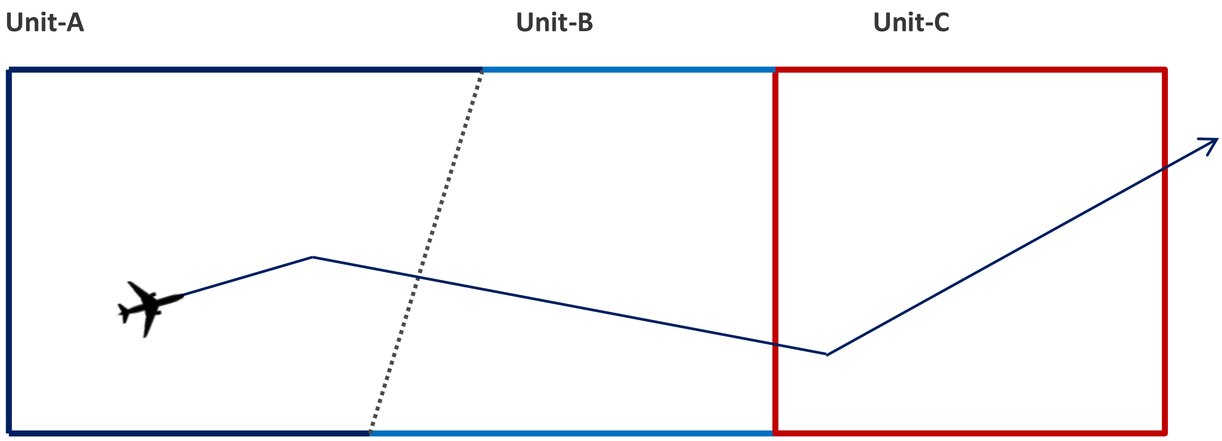


Figure 35: 2D IOP trajectory of the aircraft.

3.3.2.6.7.3.3 Operational Activity Description

The operating method is described below:

UC#0503			
Step	**Operating Method**	**V&V**	**Requirement**
1	RE-B detects that the Aircraft has a potential conflict in his airspace and unskips.	O	SEQM.0002
2	Information is shared among the three Units that Unit-B is no longer skipped.	S	COTR.0110
3	C&T Data between Unit-A and Unit-B are updated and made available to the REs.	S/O	SEQM.0022 SEQM.0081

UC#0503			
Step	**Operating Method**	**V&V**	**Requirement**

4	Since Unit-B is no longer skipped, the following data shall be provided:
	• by Unit-A to his RE:
	  ○ Unit-B's Receiving RE ID and frequency,
	• by Unit-B to his RE:
	  ○ Unit-A's Transferring RE ID and frequency,
	  ○ Unit-C's Receiving RE ID and frequency,
	• by Unit-C to his RE:
	  ○ Unit-B's Transferring RE ID and frequency.
		O	COTR.0109

Table 89: Operating Method for Unskip of a Unit skipped in favour of the upstream

3.3.2.6.7.4 UC#0504: Manual skipping the downstream IOP Unit

This use case describes the process by which an IOP Unit can manually SKIP its downstream IOP Unit.

3.3.2.6.7.4.1 Actors

- **Unit-A:** first of the three successive IOP Units crossed by the Aircraft's trajectory.
- **Unit-B:** second of the three successive IOP Units crossed by the Aircraft's trajectory.
- **Unit-C:** third of the three successive IOP Units crossed by the Aircraft's trajectory.
- **Aircraft:** the flight, which is going to cross the airspace of Units A, B & C.

3.3.2.6.7.4.2 Preconditions and Assumptions

1. The Aircraft is under control and on frequency of Unit-A

   Should the Aircraft be under the control of an upstream IOP Unit of Unit-A, this UC would apply with no restriction.

2. The boundary between Unit-A and Unit-B is in CAP.

   Should the boundary between Units-A & B not yet be in CAP:

   - *Either Unit-B is in SAP and this UC would apply with no restriction (this proposal does not trigger the CAP),*
   - *Or Unit-B is not in SAP and it will not be able to respond to Unit-A's proposal which means the Skip will be rejected.*

   Should the boundary between Units-A & B be in NP, this UC would apply with no restriction (as the SKIP is negotiated).

3. Either only one sector of Unit-B is crossed by the planned trajectory or only one sector of Unit-B is not yet skipped.

Should several sectors of Unit-B be crossed by the planned trajectory and more than one of those sectors have not yet been skipped, please refer to UC#0506 & #0507.

4. No C&T Negotiable data is manually set between Unit-A & Unit-B or between Unit-B & Unit-C.

    Should a C&T Negotiable data be manually set before the SKIP, this data would remain available after the SKIP, even if it might be replaced by another data on Unit-A's HMI (e.g. TFL A|B is replaced by TFL B|C as exit level, nevertheless, TFL A|B remains as a constraint in the flight script).

5. The SKIP proposal is set manually.

    For automatic SKIP proposal, please refer to UC#0501.

6. The SKIP answer (approval/rejection) is set manually.

    Should the SKIP be responded to automatically by the system, the only difference would be the related indication in step 5.

7. The SKIP proposal is made by Unit-A to Unit-B.

    Should the SKIP proposal be made by Unit-B to Unit-A, this UC would apply with no restriction only that the responding unit would be Unit-A in steps 3, 4 & 5.

8. The SKIP proposal is accepted by Unit-B.

    Should the proposal be rejected by Unit-B (automatically or manually), the process would be stopped at step 6 after reception by Unit-A of the rejection.

3.3.2.6.7.4.3 Operational Activity Description

The operating method is described below:

Step	Operating Method	V&V	Requirement
1.	Via an input in his HMI, Unit-A's ATCO sends a proposal to Unit-B to be skipped as a downstream.	O	SEQM.0018 SEQM.0021
2.	The proposal is tagged as manually done.	S	SEQM.0052
3.	Unit-B receives the SKIP manual proposal.	O	
4.	Unit-B accepts the SKIP proposal and provides Release conditions in its airspace. *Note: These Release conditions can be set automatically by the system or manually by the ATCO.*	O	SEQM.0018 COTR.0060
5.	Unit-B's response indicates whether it was automatic or manual.	S	SEQM.0052
6.	Upon reception of the approval, information is shared that Unit-B, which remains in the control sequence, is skipped as a downstream.	S	SEQM.0018 COTR.0146

Step	Operating Method	V&V	Requirement
7.	Unit-A's ATCO has access via his HMI to the following C&T data: • Unit-C's frequency as his next frequency, • Unit-C's sector identification as his next sector, • Unit-C's phase of coordination, • Unit-B being skipped as a downstream, • The C&T Negotiable data related to the boundary between Unit-B and Unit-C, • The Release conditions offered by Unit-B.	O	COTR.0109 COTR.0110 COTR.0027 COTR.0146 COTR.0187
8.	Information is available to Unit-C's ATCO that the transferring sector/frequency are the one from Unit-A, which is now his upstream coordination partner.	O	COTR.0109
9.	Unit-B's ATCO continues to have access to all coordination data linked to his boundaries with Unit-A and Unit-C.	O	SEQM.0022

Table 90: Operating Method for Manually skipping the downstream IOP Unit

3.3.2.6.7.5 UC#0506: Internal sector skip/un-skip (control remains in same unit)

This use case describes a skip of a sector in favour of another sector of the same IOP Unit, affecting the transferring or the receiving responsible entity between two IOP Units.

3.3.2.6.7.5.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- The skipped RE – the RE skipped in favour of its upstream or downstream RE
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.7.5.2 Preconditions

1. For Sub Use Case 1 and Sub Use Case 3, more than one RE of the Transferring Unit are crossed by the Aircraft trajectory.
2. For Sub Use Case 2, more than one RE of the Receiving Unit are crossed by the Aircraft trajectory.

3.3.2.6.7.5.3 Assumptions

1. The transferring Unit is controlling the flight.
   If not, the UC remains valid.
2. In Sub Use Case 3, the un-skip is performed by the skipped RE.

*Should the un-skip action be performed by the RE planned to control the flight on behalf of the skipped RE, the requirement for Step 4 would be*SEQM.0080.

3.3.2.6.7.5.4 Operational Activity Description

Sub Use Case 1 – Last RE of the Transferring Unit is skipped in favour of its upstream sector

Step	Operating Method	V&V	Requirement
1	After internal negotiation (verbal or electronic) between the 2 last REs of the Transferring Unit, the last RE of the Transferring Unit is skipped in favour of its upstream RE.	O/S	SEQM.0001
2	The Transferring Unit shares the information that its Transferring RE is now the second to last RE of the Transferring Unit. The C&T functional data also contains the information about the skipped RE. Depending on the capabilities of the system performing the internal skip, the skip RE is also shared.	S	COTR.0110 COTR.0146 **Error! Reference source not found.**
3	The Receiving RE is now informed that the second to last RE will transfer the flight and that the last RE is skipped.	O/S	COTR.0109 COTR.0110 COTR.0146
4	The aircraft is instructed either by voice or via CPDLC to change to the Receiving RE frequency.	O/S	COTR.0032
5	The flight is assumed by the Receiving RE.	O/S	COTR.0034

Table 91: Operating Method for last RE skipped

Sub Use Case 2 - First RE of the Receiving Unit is skipped in favour of its downstream sector

Step	Operating Method	V&V	Requirement
1	After internal negotiation (verbal or electronic) between the 2 first REs of the Receiving Unit, the first RE of the Receiving Unit is skipped in favour of its downstream RE.	O/S	SEQM.0001
2	The Receiving Unit informs the Transferring Unit that the Receiving RE has changed. The C&T functional data also contains the information about the skipped RE. Depending on the capabilities of the system performing the internal skip, the skip RE is also shared.	S	COTR.0110 **Error! Reference source not found.**

Step	Operating Method	V&V	Requirement
3	The Transferring RE is now informed that the flight shall be transferred to the second RE of the Receiving Unit and that the first RE is skipped.	S	COTR.0109 COTR.0110 COTR.0146
4	The aircraft is instructed either by voice or via CPDLC to change to the Receiving RE frequency.	O/S	COTR.0032
5	The flight is assumed by the Receiving RE.	O/S	COTR.0034

Table 92: Operating Method for first RE skipped

Sub Use Case 3 – Last RE of the Transferring Unit is skipped in favour of its upstream RE and un-skipped before the flight is transferred to the Receiving RE

Step	Operating Method	V&V	Requirement
1	After internal negotiation (verbal or electronic) between the 2 last REs of the Transferring Unit, the last RE of the Transferring Unit is skipped in favour of its upstream RE.	O/S	SEQM.0001
2	The Transferring Unit shares the information that its Transferring RE is now the second to last RE of the Transferring Unit. The C&T functional data also contains the information about the skipped RE. Depending on the capabilities of the system performing the internal skip, the skip RE is also shared.	S	COTR.0110 COTR.0146 **Error! Reference source not found.**
3	The Receiving RE is now informed that the second to last RE will transfer the flight and that the last RE is skipped.	S	COTR.0109 COTR.0110
4	Situation has changed and the skipped RE is manually un-skipped.	O/S	SEQM.0002
5	The Transferring Unit shares the information that its Transferring RE is now last RE.	S	
6	The Receiving RE is now informed that the flight will be transferred by the last RE of the Transferring Unit.	O/S	COTR.0109 **Error! Reference source not found.**

Table 93: Operating Method for last RE skipped & unskipped

3.3.2.6.7.6 UC#0510: Manual partial delegation and cancellation

This use case describes the process of delegation of control by an IOP Unit to another IOP Unit not yet in the control sequence (whose Area of Responsibility is not crossed by the IOP trajectory).

3.3.2.6.7.6.1 Actors

- **Delegator Unit** – the first of the two successive IOP Units crossed by the IOP trajectory, who's going to delegate the flight to the Delegatee Unit.
- **Unit-B** – the second of the two successive IOP Units crossed by the IOP trajectory.
- **Delegatee Unit** – An IOP Unit which is neither Receiving or Transferring RE to the Delegator Unit in control sequence and to whom the control of the flight will be delegated by the Delegator Unit.
- **Aircraft** – The flight proposed to be transferred to a non-crossed IOP Unit (Delegatee unit).

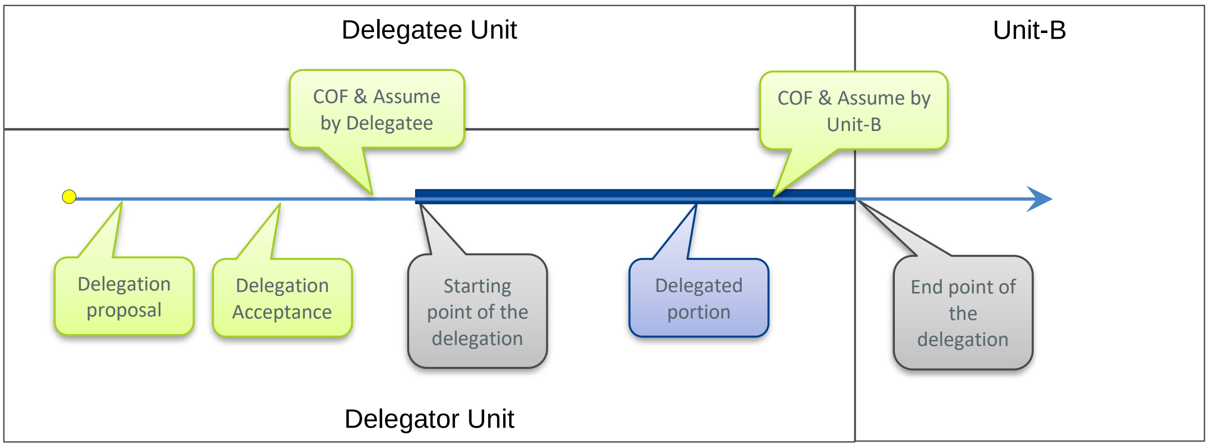


Figure 36: Delegation Process

3.3.2.6.7.6.2 Preconditions

1. The Aircraft crosses the Area of Interest of the Delegatee Unit.

3.3.2.6.7.6.3 Assumptions

1. Delegator Unit is controlling the Aircraft.

   Should the Aircraft be controlled by a further upstream IOP Unit, the use-case would apply with no restriction.
2. The coordination phase between the Delegator Unit & Unit-B is not yet in CAP.

   Should the coordination phase between the Delegator Unit & Unit-B already be in CAP (or NP), the upstream boundary of Unit-B (now with the Delegatee Unit) shall remain in CAP (or NP) after the implementation of the delegation and not revert to SAP due to a change of the control sequence list.

   Operationally, it would not be expected that a delegation be made once a boundary is in NP, however the system should not prevent it.
3. The proposal is made by the Delegator Unit.

   Should the delegation proposal be made by the Delegatee Unit, then the following requirements would be replaced:
   - *Step 1:* SEQM.0004*would be replaced by* SEQM.0030

4. The delegation is manually proposed.

   For automatic delegation implementations, please refer to UC#0508.
5. The Delegatee Unit is adjacent to the Delegator Unit.

   Should the Delegatee not be adjacent, the UC would apply with no restriction.
6. The Delegator Unit delegates the Aircraft for the whole remaining airspace of his Area of responsibility.

   Should the Delegator limit the delegation to a portion of his remaining area of responsibility, the following steps would be modified:
   - *On step 2, the Delegatee's downstream would be the Delegator Unit again,*
   - *On step 3, two separate C&T data set would be made available between the Delegator and the Delegatee Units,*
   - *On step 10, Unit-B can be aware that the Aircraft will be transferred by the Delegator Unit.*
   - *On step 12, the next sector/frequency information available for the Delegatee ATCO would be the Delegator Unit sector/frequency,*
   - *On step 13, the Delegatee ATCO would make a frequency change to the Delegator Unit,*
   - *On step 14, the assumption would be performed by the Delegator Unit.*
7. In the sub-UC 3, the delegation cancellation is made by the Delegator.

   Should the Delegatee cancel the delegation, requirement SEQM.0005*would be replaced by requirement*SEQM.0064.
8. The Delegatee Unit's downstream is not modified during the process.

   Should the Delegatee Unit's downstream be modified during the process, requirement SEQM.0070*would apply.*
9. During the delegation (during the period of time where the Delegatee Unit is controlling the aircraft), no negotiation related to this aircraft is launched between the Delegator and the Delegatee Units.

   Should a negotiation be launched between the Delegator & Delegatee Units, requirements SEQM.0039& SEQM.0071*would apply.*
10. During the delegation, the Delegatee's Area of Responsibility remains uncrossed.

    Should the Delegatee's Area of Responsibility be crossed during the delegation after a route/level change, the delegation would be terminated and a new control sequence would be computed.

3.3.2.6.7.6.4 Operational Activity Description

Use Case 1 / Delegation implementation

UC#0510-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	By an input on its HMI, Delegator Unit's RE initiates a proposal of delegation of an Aircraft to the Delegatee Unit's RE.	O	SEQM.0004
2	The Delegator Unit defines the Delegatee's downstream unit as being Unit-B.	O/S	SEQM.0067
3	The delegation proposal includes the C&T data between the Delegatee and his upstream & downstream IOP Units, respectively the Delegator Unit & Unit-B. The CAP between the Delegator and the Delegatee is triggered.	S	SEQM.0082 SEQM.0083

UC#0510-1			
Step	**Operating Method**	**V&V**	**Requirement**
4	The delegation proposal includes the Release to be offered to the Delegatee Unit (No or Full Release).	O/S	SEQM.0069
5	Delegator Unit shares the proposal to the Delegatee Unit.	S	SEQM.0004
6	Delegatee Unit receives the proposal.	S	
7	Delegatee Unit/RE accepts the proposal. *Note: whether the proposal has been automatically accepted by the Delegatee Unit or proposed to its RE for a manual input is local decision.*	O/S	COTR.0204
8	Delegator Unit receives the approval and implements the delegation which is shared.	S	SEQM.0067
9	The Delegator & Delegatee REs are made aware of the delegation.	O	SEQM.0068
10	Unit-B has access to the information that the Aircraft will be transferred by the Delegatee Unit instead of the previously crossed unit (Delegator Unit).	S	COTR.0109 SEQM.0068
11	The Delegator RE makes a frequency change to the Delegatee RE.	O	
12	The Delegatee Unit assumes the Aircraft. The next sector/frequency information available for the Delegatee Unit is the Unit-B's sector/frequency.	O	
13	The Delegatee RE performs a frequency change to the Unit-B's frequency.	O	
14	Unit-B assumes the Aircraft.	O	

Table 94: Operating Method for manual partial Delegation implementation

Use Case 2 / Delegation rejection

UC#0510-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	By an input on its HMI, Delegator Unit's RE initiates a proposal of delegation of an Aircraft to the Delegatee Unit's RE.	O	SEQM.0004
2	The Delegator Unit defines the Delegatee's downstream unit as being Unit-B.	O/S	SEQM.0067
3	The delegation proposal includes the C&T data between the Delegatee and his upstream & downstream IOP Units, respectively the Delegator Unit & Unit-B. The CAP between the Delegator and the Delegatee is triggered.	S	SEQM.0082 SEQM.0083

UC#0510-2			
Step	**Operating Method**	**V&V**	**Requirement**
4	The delegation proposal includes the Release to be offered to the Delegatee Unit (No or Full Release).	O/S	SEQM.0069
5	Delegator Unit shares the proposal to the Delegatee Unit.	S	SEQM.0004
6	Delegatee Unit receives the proposal.	S	
7	Delegatee Unit/RE **rejects** the proposal. *Note: whether the proposal has been automatically rejected by the Delegatee Unit or proposed to its RE for a manual rejection is local decision.*	O/S	COTR.0204
8	Delegator Unit receives the rejection and cancels the delegation proposal.	S	COTR.0090
9	The Delegator RE is made aware of the delegation rejection.	O	COTR.0214

Table 95: Operating Method for Delegation rejection

Use Case 3 / Delegation cancellation (after implementation)

UC#0510-3			
Step	**Operating Method**	**V&V**	**Requirement**
1	By an input on its HMI, Delegator Unit's RE initiates a proposal of delegation of an Aircraft to the Delegatee Unit's ATCO.	O	SEQM.0004
2	The Delegator Unit defines the Delegatee's downstream unit as being Unit-B.	O/S	SEQM.0067
3	The delegation proposal includes the C&T data between the Delegatee and his upstream & downstream IOP Units, respectively the Delegator Unit & Unit-B. The CAP between the Delegator and the Delegatee is triggered.	S	SEQM.0082
4	The delegation proposal includes the Release to be offered to the Delegatee Unit (No or Full Release).	O/S	SEQM.0069
5	Delegator Unit shares the proposal to the Delegatee Unit.	S	SEQM.0004
6	Delegatee Unit receives the proposal.	S	
7	Delegatee Unit/RE accepts the proposal. *Note: whether the proposal has been automatically accepted by the Delegatee Unit or proposed to its RE for a manual input is local decision.*	O/S	COTR.0204
8	Delegator Unit receives the approval, implements the delegation which is shared.	S	SEQM.0004
9	The Delegator & Delegatee REs are made aware of the delegation.	O	COTR.0214

UC#0510-3			
Step	**Operating Method**	**V&V**	**Requirement**
10	The Downstream Unit has access to the information that the Aircraft will be transferred by the Delegatee Unit instead of the previously crossed unit (Delegator Unit).	S	COTR.0109
11	Before the frequency change occurs between the Delegator Unit and the Delegatee Unit, the Delegator RE changes his mind and cancels the delegation (which will no longer occur).	O	SEQM.0005
12	The Delegator Unit shares the delegation cancellation and as a result: • The Delegatee Unit is removed from the control sequence, • The Delegator Unit's downstream becomes Unit-B, • The C&T data between the Delegator and the Delegatee Units are removed, • The C&T data between the Delegatee and Unit-B are removed, • The C&T data between the Delegator and Unit-B are updated.	S	SEQM.0078
13	All concerned REs of Delegator Unit, Delegatee Unit and Unit-B are made aware of the Delegation cancellation.	O	COTR.0109 COTR.0147

Table 96: Operating Method for Delegation cancellation

3.3.2.6.7.7 UC#0518: "No_Contact" implementation

This use case describes the process by which an RE can avoid having the aircraft on frequency by a direct transfer from its upstream to its downstream. In IOP environment, this functionality is called 'No_Contact'.

Coordination structures are not affected by No_Contact. The only thing affected is the display for the involved REs A and C to know the ID and the frequency of the transferring/receiving REs. B is responsible for updating coordination and notifying A of what it is expected to do. The system will not update coordination data or prevent coordination updates made by A,B or C.

3.3.2.6.7.7.1 Actors

- Unit-A – the first of the three successive IOP Units in the control sequence, expected to transfer the flight directly to Unit-C once No_Contact of Unit-B is implemented.
- Unit-B – The second of the three successive IOP Units in the control sequence, that is expected to perform a No_Contact.
- Unit-C – The third of the three successive IOP Units in the control sequence, that is expected to receive the flight from Unit-A once No_Contact of Unit-B is implemented.
- RE-A, RE-B, RE-C are the Responsible Entities respectively defined by Units A, B and C.
- Aircraft – the flight which is to be transferred from Unit-A to Unit-C once No_Contact of Unit-B is implemented.

3.3.2.6.7.7.2 Preconditions

- The flight is crossing the AoR of all three IOP units in the following order: A-B-C.
- The flight is still under control and on frequency of Unit A.
- The flight has not yet entered the AoR of Unit B.

  Should the flight have already entered the AoR of Unit B the Use Case remains valid.

- Unit A is in CAP with Unit B.

  Should the boundary between the two units be in NP the Use Case remains valid but a possible coordination would have to be negotiated.

- Unit B is in CAP with Unit C.

  Should the boundary between the two units be in NP the Use Case remains valid but a possible coordination would have to be negotiated.

3.3.2.6.7.7.3 Operational Activity Description

This UC is divided into 5 Sub UCs:

1. Nominal case
2. No_Contact with change of coordination
3. Cancel 'No_Contact'
4. Force Assume as 'No_Contact'
5. Request on Frequency as 'No_Contact'

The operating methods are described below:

Sub UC1: Nominal case

UC#0518-1			
Step	**Operating Method**	**V&V**	**Requirement**
1	The frequency and/or sector ID of RE-B is displayed on RE-A's HMI.	O	Local HMI
2	Unit-B performs a 'No_Contact' input in order to indicate to Unit-A to transfer communication straight to Unit C.	S/O	SEQM.0089
3	The frequency and/or sector ID of RE-C is displayed on RE-A's HMI.	O	Local HMI
4	RE-A performs a frequency change to RE-C. The frequency change status is made available on the HMIs of RE-A & C).	O	COTR.0032 COTR.0132
5	The NP is triggered between Unit-A & Unit-B and Unit-B & Unit-C.	S	COTR.0135

UC#0518-1			
Step	**Operating Method**	**V&V**	**Requirement**
6	RE-C assumes the flight. The assumption is made available on all three HMIs (RE-A, B & C).	O	COTR.0034 COTR.0132

Table 97: No_Contact implementation – Nominal Case

Sub UC2: No_Contact with change of coordination

UC#0518-2			
Step	**Operating Method**	**V&V**	**Requirement**
1	The frequency and/or sector ID of RE-B is displayed on RE-A's HMI.	O	Local HMI
2	Unit-B performs a 'No_Contact' input in order to indicate to Unit-A to transfer communication straight to Unit C.	S/O	SEQM.0089
3	The frequency and/or sector ID of RE-C is displayed on RE-A's HMI.	O	Local HMI
4	RE-B changes the TFL with RE-C. B is responsible for updating coordination and notifying A of what it is expected to do.	O	COTR.0121
5	The TFL change is displayed in RE-C	O	Local HMI
6	RE-A performs a frequency change to RE-C. The frequency change status is made available on the HMIs of RE-A & C).	O	COTR.0032 COTR.0132
7	The NP is triggered between Unit-A & Unit-B and Unit-B & Unit-C.	S	COTR.0135
8	RE-C assumes the flight. The assumption is made available on all three HMIs (RE-A, B & C).	O	COTR.0034 COTR.0132

Table 98: No_Contact with change of coordination

Sub UC3: Cancel 'No_Contact'

UC#0518-3			
Step	**Operating Method**	**V&V**	**Requirement**
1	The frequency and/or sector ID of RE-B is displayed on RE-A's HMI.	O	Local HMI
2	Unit B performs a 'No_Contact' input in order to indicate to Unit A to SEND the flight straight to Unit C.	S/O	SEQM.0089

UC#0518-3			
Step	**Operating Method**	**V&V**	**Requirement**
3	The frequency and/or sector ID of RE-C is displayed on RE-A's HMI.	O	Local HMI
4	Unit B performs an input in order to indicate to Unit A to SEND the flight to Unit B again instead of Unit C (Cancel 'No_Contact').	S/O	SEQM.0090
5	The frequency and/or sector ID of RE-B is displayed on RE-A's HMI.	O	Local HMI
6	RE-A performs a frequency change to RE-B. The Frequency change status is made available on both HMIs (RE-A & B).	O	COTR.0032
7	The NP is triggered between Unit A & Unit-B.	S	COTR.0135
8	RE-B can assume the flight. The assumption is made available on both HMIs (RE-A & B).	O	COTR.0034

Table 99: Cancel 'No_Contact'

Sub UC4: Force Assume as 'No_Contact'

UC#0518-4			
Step	**Operating Method**	**V&V**	**Requirement**
1	The frequency and/or sector ID of RE-B is displayed on RE-A's HMI.	O	Local HMI
2	Unit B performs a 'No_Contact' input in order to indicate to Unit A to SEND the flight straight to Unit C.	S/O	SEQM.0089
3	The frequency and/or sector ID of RE-C is displayed on RE-A's HMI.	O	Local HMI
4	RE-B force assumes the flight.	O	COTR.0055
5	The Stolen indication is displayed on RE A's HMI.	S	COTR.0052
6	The 'No_Contact' is cancelled and Unit B has the flight assumed.	S/O	SEQM.0092
7	The Stolen indication is removed from RE A's HMI (either manually or automatically depending on local implementation).	S/O	COTR.0053

Table 100: No_Contact implementation – Force Assume as 'No_Contact'

Sub UC5: Request on Frequency as 'No_Contact'

UC#0518-5			
Step	**Operating Method**	**V&V**	**Requirement**
1	The frequency and/or sector ID of RE-B is displayed on RE-A's HMI.	O	Local HMI
2	Unit B performs a 'No_Contact' input in order to indicate to Unit A to SEND the flight straight to Unit C.	S/O	SEQM.0089
3	The frequency and/or sector ID of RE-C is displayed on RE-A's HMI.	O	Local HMI
4	RE-B performs a Request on Frequency input.	S/O	COTR.0040
5	The Request on Frequency is displayed on RE-A's HMI.	S/O	COTR.0041
6	The 'No_Contact' is cancelled, Unit-B is now the new Receiving Unit and the NP is triggered between Units A and B.	S	SEQM.0090 COTR.0043 SEQM.0102

Table 101: No_Contact implementation – Request on Frequency as 'No_Contact'

3.3.2.6.8 SSR CODE MANAGEMENT USE CASES

3.3.2.6.8.1 UC#0801: Modifying and sharing the IOP_NSSR, IOP_ASSR & IOP_CSSR

This use case describes the process by which the Assigned, Next & Current SSR codes are assigned and shared.

3.3.2.6.8.1.1 Actors

- Controlling Unit – The IOP Unit currently controlling the flight.
- Aircraft – the flight which is to subject to SSR Code assignment.

3.3.2.6.8.1.2 Operational Activity Description

The operating method is described below:

UC#0801			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Controlling Unit assigns an IOP_ASSR to the Aircraft. The IOP_ASSR is shared. Note: The IOP_ASSR allows the other IOP Units to correlate.	O/S	SSRC.0001
2	The Aircraft automatically correlates with the track in the Controlling Unit. The IOP_CSSR is shared. In this case, IOP_CSSR is equal to the IOP_ASSR.	S	SSRC.0003 SSRC.0009

UC#0801			
Step	**Operating Method**	**V&V**	**Requirement**
3	For any operational reason, the Controlling Unit has to allocate a new SSR Code to the Aircraft. This code is shared via the IOP_NSSR.		SSRC.0002
4	The Controlling Unit instructs the pilot to squawk the IOP_NSSR depending on the Controlling Unit system: • IOP_ASSR is updated at this stage or later (when Aircraft changes its squawk) IOP_NSSR is reset as this stage or later (when Aircraft changes its squawk).	O/S	SSRC.0001
5	Upon detection of the new squawk by the Controlling Unit, the correlation is maintained and the IOP_CSSR is updated to the IOP_ASSR value. If not already done in the previous step, the IOP_ASSR is updated and the IOP_NSSR is reset.	S	SSRC.0003 SSRC.0009
6	Because of an emergency, the Aircraft changes the code to 7700. The correlation is maintained. The IOP_CSSR is updated to 7700. The IOP_ASSR remains unchanged. Note: Other IOP Units can maintain the correlation based on the CSSR.	S	SSRC.0009

Table 102: Operating Method for modifying & sharing SSR codes

3.3.2.6.8.2 UC#0805: To request and provide the IOP_DSSR

This use case describes the process by which the Transferring IOP Unit requests to the Receiving IOP Unit to provide his SSR code (IOP_DSSR).

3.3.2.6.8.2.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE

3.3.2.6.8.2.2 Preconditions

1. The Transferring Unit needs the Receiving Unit to provide the IOP_DSSR.

The reason is independent from the UC. An example is when the Transferring Unit is crossed for a short period of time but belongs to a different ORCAM region. To avoid wasting one of its SSR codes, it'd rather anticipate the SSR code that will be used for much longer in the Receiving Unit.

3.3.2.6.8.2.3 Assumptions

1. Both the Transferring & Receiving Units are already in System Awareness Phase (SAP).

If any of the two IOP Units is not in SAP, this UC can't be performed.

Should the coordination phase between the two IOP Units be CAP or NP, the UC remains fully applicable.

3.3.2.6.8.2.4 Operational Activity Description

The operating method is described below:

UC#0805			
Step	**Operating Method**	**V&V**	**Requirement**
1	The Transferring RE needs to assign to the Aircraft a new SSR code provided by the Receiving Unit.	O	
2	An automatic or manual request of the IOP_DSSR is shared.	S	SSRC.0006
3	The Receiving Unit retrieves the request.	S	
4	In response, the Receiving Unit provides its IOP_DSSR (Downstream SSR Code).	S	SSRC.0004
5	The Transferring Unit retrieves the IOP_DSSR.	S	
6	The Transferring RE is made aware of the IOP_DSSR code of the Receiving Unit and may assign it to the Aircraft.	O	SSRC.0005

Table 103: Operating Method for requesting & providing the IOP_DSSR

3.3.2.6.9 TMA USE CASES

3.3.2.6.9.1 UC#1101: Departure Information Update

This Use Case describes the procedure of a departure information update of the trajectory/FO during the departure process of an aircraft. It comprises the push-back, taxi and take-off.

3.3.2.6.9.1.1 Actors

- Departure Unit – The non-IOP unit (e.g. TWR, TMA, etc.) that transmits the time updates to the first IOP unit.
- Transferring RE – the RE determined by the Transferring Unit (e.g. TMA, ACC, etc.) which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.

- Aircraft – the flight which is to be transferred from the Transferring RE to the Receiving RE.

3.3.2.6.9.1.2 Preconditions

1. Neither the Transferring nor the Receiving Unit are skipped.
2. The points between the departure airport and the IOP area should be known by all IOP partners.
3. The departure airport either belongs to the IOP area or is close to the boundary.

3.3.2.6.9.1.3 Assumptions

1. The Aircraft has not departed yet.
2. The coordination phase between the Transferring Unit and the Receiving REs is already in Controller Awareness Phase (CAP) and this information is included in the FO. The Transferring RE and the Receiving RE are officially aware of the Aircraft.

If the coordination phase between the Transferring Unit and the Receiving REs is in SAP, the UC remains valid.

If the coordination phase between the Transferring Unit and the Receiving REs is in NP, the UC remains valid.

3.3.2.6.9.1.4 Operational Activity Description

Step	Operating Method		V&V	Requirement
1	An EOBT is existing in the FPL and all the estimates are computed.		S	GENE.0012 ADMG.0002
2	An EOBT and/or all the estimates are shared.		S	GENE.0001 ADMG.0002
3	An EOBT and/or all the estimates are available at the Receiving RE.		S	GENE.0002 ADMG.0002
4	Push-back clearance is issued to the flight crew and, if applicable, a DPI message is sent to NM by the departure unit. Note: The relevant systems in the departure unit should be provided with a means to input and forward "start-up clearance", "push-back clearance ", "taxi clearance " or the occurrence of a similar event from which the ETOT may be derived in order to calculate an ETO at the first IOP unit.		O	
5	A flag is available for this flight in the FO that indicates that a push-back clearance has been issued or a similar event has occurred.		S	ADMG.0005
6	Updated ETOT is existing for the FPL and all the estimates are available at the Transferring RE.		S	GENE.0012
7	ETOT and/or all the estimates are shared.		S	GENE.0001 ADMG.0003

Step	Operating Method		V&V	Requirement
8	ETOT and/or all the estimates are available at the Receiving RE.		S	GENE.0002 ADMG.0003
9	ETOT is changed for the FPL and the updated estimates are available at the Transferring RE.		S	GENE.0012
10	The updated ETOT and/or the updated estimates are shared.		S	GENE.0001 ADMG.0003
11	The updated ETOT and/or the updated estimates are available at the Receiving RE.		S	GENE.0002 ADMG.0003
12	The flight is cleared for take-off or is airborne and the departure unit publishes the ATOT.		O	
13	A flag is available for this flight in the FO that indicates that a take-off clearance has been issued or the flight is airborne.			ADMG.0006
14	ATOT is existing for the FPL and the estimates are available at the Transferring RE.		S	GENE.0012
15	An ATOT and/or the estimates are shared.			GENE.0001 ADMG.0004
16	ATOT and/or the estimates are available at the Receiving RE.		S	GENE.0002 ADMG.0004

Table 104: Operation Method for Departure Information Update

3.3.2.6.9.2 UC#1102: SID Definition Change

3.3.2.6.9.2.1 Actors

- Transferring RE – the RE determined by the Transferring Unit which is the first of the two IOP Units in the control sequence. The Transferring RE is expected to transfer the flight to the Receiving RE.
- Receiving RE – the RE determined by the Receiving Unit which is the second of the two IOP Units in the control sequence. The Receiving RE is expected to receive the flight from the Transferring RE.
- Aircraft: the flight to which the SID is to be assigned in accordance with rules at its departure aerodrome.

3.3.2.6.9.2.2 Preconditions

1. The aircraft is cleared to depart via a published SID procedure.

2. In sub-UC 1, the Transferring RE contains the departure aerodrome and the full SID procedure.
3. In sub-UC 2, the Transferring RE contains the departure aerodrome and the start of the SID procedure, Receiving RE contain the later part of the SID procedure.

3.3.2.6.9.2.3 Assumptions

1. The aircraft is under departure preparations and not airborne.
2. The coordination phase between the Transferring Unit and the Receiving REs is already in Controller Awareness Phase (CAP) and this information is included in the FO. The Transferring RE and the Receiving RE are officially aware of the Aircraft.

   If the coordination phase between the Transferring Unit and the Receiving REs is in SAP, the UC remains valid.

   If the coordination phase between the Transferring Unit and the Receiving REs is in NP, the UC remains valid.

3.3.2.6.9.2.4 Operational Activity Description

The operating method is described below:

Sub-UC 1; The departure aerodrome and the full SID procedure located in same IOP Unit.

Step	Operating Method	V&V	Requirement
1	Transferring RE creates and distributes a FO and becomes FDMP for the concerned flight.	S	GENE.0001
2	Transferring RE is aware of departure runway and EOBT and share this information.	S	GENE.0016
3	Transferring RE shares the SID procedure associated to the runway in use and ENR airspace connecting point filled in the flight plan.	S	FSMG.0010
4	The aircraft trajectory is updated accordingly.	S	COTR.0125 FSMG.0005 FSMG.0087 FSMG.0017 FSMG.0019
5	The active departure runway is changed. The information (and potential new EOBT) is shared by Transferring RE.	S	GENE.0016 GENE.0001
6	Transferring RE shares the new SID procedure associated to the new runway in use and ENR airspace connecting point filled in the flight plan.	S	FSMG.0010

Step	Operating Method	V&V	Requirement
7	The aircraft trajectory is updated accordingly.	S	COTR.0125 FSMG.0005 FSMG.0087 FSMG.0017 FSMG.0019

Table 105: Operating Method for SID Definition Change when the departure aerodrome and the full SID procedure located in same IOP Unit.

Sub-UC 2; The departure aerodrome and part of the SID is in different IOP Units.

Step	Operating Method	V&V	Requirement
1	Transferring RE creates and distributes a FO and becomes FDMP for the concerned flight.	S	GENE.0001
2	Transferring RE is aware of departure runway and EOBT and share this information.	S	GENE.0016
3	Transferring RE shares the SID procedure associated to the runway in use and ENR airspace connecting point filled in the flight plan.	S	FSMG.0010
4	Receiving RE checks the flight data and synchronizes its local view	S	GENE.0004 GENE.0012
5	The aircraft trajectory is updated accordingly.	S	COTR.0125 FSMG.0005 FSMG.0087 FSMG.0017 FSMG.0019
6	The active departure runway is changed. The information (and potential new EOBT) is shared by Transferring RE.	S	GENE.0016 GENE.0001
7	Transferring RE shares the new SID procedure associated to the new runway in use and ENR airspace connecting point filled in the flight plan.	S	FSMG.0010
8	The aircraft trajectory is updated accordingly.	S	COTR.0125 FSMG.0005 FSMG.0087 FSMG.0017 FSMG.0019
9	Receiving RE checks the flight data and synchronizes its local view	S	GENE.0004

Table 106: Operating Method for SID Definition Change when The departure aerodrome and part of the SID is in different IOP Units.

3.3.2.6.9.3 UC#1103: STAR definition and change (& Arrival transitions)

The approach phases are, fully or partly, in the TMA airspace. From theses phases only changes of runway in use must be shared because as it has an impact on STAR and IAF

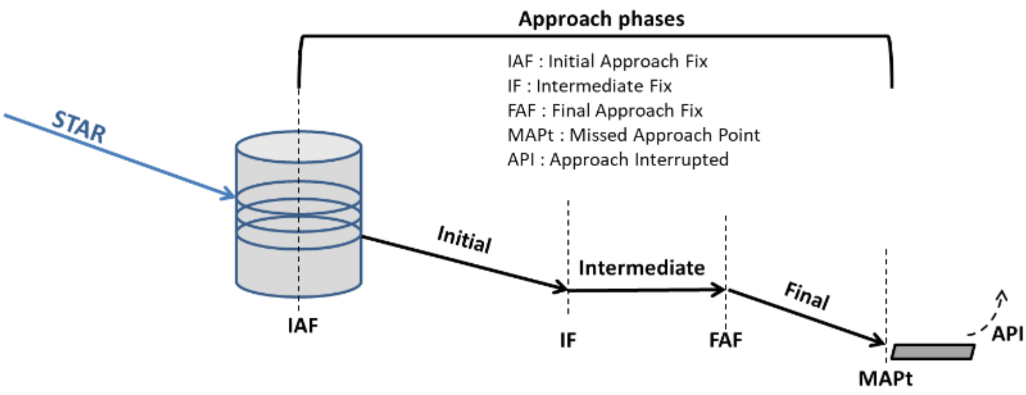


Figure 37: STAR Definition and Change (&Arrival transitions) Approach Phases

3.3.2.6.9.3.1 Actors

- Transferring Unit – the Transferring Unit is the first of the two IOP Units in the control sequence. The Transferring Unit is expected to transfer the flight to the Receiving Unit. The transferring Unit is in charge of Enroute airspace
- Receiving Unit – the Receiving Unit is the second of the two IOP Units in the control sequence. The Receiving Unit is expected to receive the flight from the Transferring Unit. The receiving Unit controls the airspace containing the Approach segment.
- Aircraft: the flight to which the STAR is to be assigned in accordance with its destination aerodrome.

3.3.2.6.9.3.2 Preconditions

1. The destination aerodrome requires a TP (Terminal procedure) as per the IFPS User Manual. A connecting point exist in the filed flight plan route in the Transferring Unit's airspace
2. The STAR connecting point and the initial part of the STAR procedure are in Transferring Unit's airspace.
3. Two sub-UCs exist depending on if the A/C have passed the connecting point (first point on STAR) or not when the procedure is changed.

3.3.2.6.9.3.3 Assumptions

1. The aircraft is already airborne in Transferring Unit's airspace when the Transferring Unit and the Receiving Unit boundary enters SAP.

Should the aircraft not be departed yet, the UC applies once the first FDMP have created and distributed the flight object.

2. The coordination phase between the Transferring Unit and the Receiving Unit is already in System Awareness Phase (SAP) and this information is included in the FO. The Transferring Unit and the Receiving Unit are officially aware of the Aircraft.

    If the coordination phase between the Transferring Unit and the Receiving Unit is in CAP, the UC remains valid.

    If the coordination phase between the Transferring Unit and the Receiving Unit is in NP, the UC remains valid.

3. The aircraft is flying to its original destination aerodrome.

Should the aircraft be diverting to an alternate aerodrome within the Transferring Unit or the Receiving Unit, the UC applies.

4. If the STAR at the destination airport is replaced by an "arrival route" or a "transition to final approach segment", those routes shall be considered as a series of points. Any such procedure, or changes thereof, shall be handled and considered as a route amendment and be used to update the trajectory accordingly.

    The above-mentioned procedures doesn´t affect this UC, which is entirely dedicated to STAR definition and change.

3.3.2.6.9.3.4 Operational Activity Description

The operating method is described below:

Sub-UC 1; STAR connecting point not overflown by the aircraft when the procedure is changed.

Step	Operating Method	V&V	Requirement
1	Transferring Unit and Receiving Unit enters SAP for the aircraft.	S	COTR.0001
2	Transferring Unit checks the flight data and synchronizes its local view.	S	GENE.0004
3	Receiving Unit checks the flight data, synchronizes its local view and shares the landing runway for this flight.	S	GENE.0004 GENE.0008 ADMG.0011
4	Receiving Unit shares the STAR procedure associated to the runway that the flight will use and STAR connecting point filed in the flight plan.	S	FSMG.0010
5	The Transferring unit update the aircraft trajectory accordingly and share the information.	S	COTR.0125 FSMG.0005 FSMG.0087
6	The ATCO in the Transferring Unit shares the information with the A/C	O	
7	The Receiving Unit changes the active landing runway and share this information.	S	GENE.0008 ADMG.0011

Step	Operating Method	V&V	Requirement
8	Receiving Unit shares any new STAR procedure associated to the new runway in use and any new STAR connecting point with the Transferring unit.	S	FSMG.0010
9	The Transferring unit update the aircraft trajectory or not, depending on control/traffic situation, any new connecting point, any new STAR procedure and share the information. Any changed route portion is marked as Uncleared until the new STAR is given to the aircraft	S	COTR.0125 FSMG.0005 FSMG.0087 FSMG.0105 FSMG.0106

Table 107 Operating Method for STAR connecting point not overflown by the aircraft when the procedure is changed

Sub-UC 2; STAR connecting point overflown by the aircraft when the procedure is changed

Step	Operating Method	V&V	Requirement
1	Transferring Unit and Receiving Unit enter SAP for the aircraft.	S	COTR.0001
2	Transferring Unit checks the flight data and synchronizes its local view.	S	GENE.0004
3	Receiving Unit checks the flight data, synchronizes its local view and shares the active landing runway.	S	GENE.0004 GENE.0008 ADMG.0011
4	Receiving Unit shares the STAR procedure associated to the runway in use and STAR connecting point filled in the flight plan.	S	FSMG.0010
5	The Transferring unit update the aircraft trajectory accordingly and share the information.	S	COTR.0125 FSMG.0005 FSMG.0087
6	The ATCO in the Transferring Unit shares the information with the A/C.	O	
7	The A/C reaches the connecting point and start the STAR procedure.	O	
8	The Receiving Unit changes the active landing runway and share this information.	S	GENE.0008 ADMG.0011
9	Receiving Unit shares any new STAR procedure associated to the new runway in use and any new STAR connecting point.	S	FSMG.0010
10	The Transferring unit update the aircraft trajectory or not, depending on the control/traffic situation, the connection point and new STAR procedure and share the information. It marks the portion corresponding to the STAR as Uncleared	S	COTR.0125 FSMG.0005 FSMG.0087 FSMG.0105

Table 108: STAR connecting point overflown by the aircraft when the procedure is changed

3.3.2.6.9.4 UC#1109: AMAN (indication of TTL / TTG & XMAN delay sharing)

This use case describes the process by which Arrival Manager (AMAN) delay information is shared with upstream centres to enable these centres to apply en-route delay actions.

Overview:

An AMAN tool calculates an arrival sequence for the destination airfield (ADES), and apportions delay to each flight to balance arrival demand with available runway capacity. This delay is shared with upstream centres via the flight object and is therefore accessible to all upstream units in the IOP region. The Current Controlling unit accesses the delay information and presents it to the responsible RE, who performs appropriate controlling actions to delay the flight, in accordance with local operating procedures and the relevant AMAN LoA. The range at which AMAN delay actions will be applied (and therefore number of centres involved) will depend on the quality of available AMAN information. Any controlling actions will be reflected in the flight object as changes in the current instruction state data, and in an updated ETA.

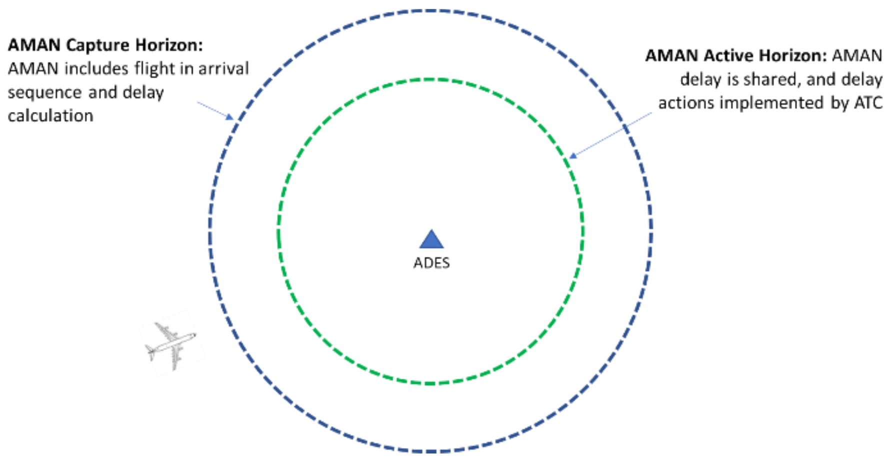


Figure 38: AMAN Capture Horizon and Active Horizon

Note: IOP is required to provide the data exchange needed to enable extended AMAN operations. However, the management and application of AMAN delay data, including for example the apportionment of delay amongst sequential centres, is managed by AMAN procedure, agreed in LoAs.

Note: This use case covers information exchanges between IOP ACC units only, and so is restricted to the case where the aircraft is airborne. In the case of very short-range flights, it is envisaged that AMAN will pass delay information to the departure airfield pre-departure. However, Towers are out of scope of basic IOP; such exchanges would therefore initially be conducted by another mechanism.

3.3.2.6.9.4.1 Actors

- Unit D: Destination Unit – The IOP Unit in which the ADES (and associated AMAN) is located
- Unit A: Current Controlling Unit – The IOP unit currently working the flight

- Units B, C: Downstream Units – IOP units whose AOIs are planned to be crossed by the flight
- Aircraft – the flight controlled by the Controlling Unit

3.3.2.6.9.4.2 Preconditions

- The flight is airborne.
- The flight is within the AMAN capture horizon and is therefore included in the AMAN arrival sequence calculation.

3.3.2.6.9.4.3 Assumptions

– The AMAN function is hosted by the Destination IOP unit (i.e. is not a separate IOP unit in its own right)

3.3.2.6.9.4.4 Operational Activity Description

The operating method is described below:

UC#1109			
Step	**Operating Method**	**V&V**	**Requirement**
1	The aircraft enters the AMAN active horizon	O	
2	The AMAN shares delay request information with the current unit and upstream units via the FO.	S	ADMG.0007 ADMG.0008
3	The Current Controlling Unit accesses the delay information	S	
4	*The delay request information is processed in accordance with the AMAN LoA, and made available to the ATCO team currently working the flight*	S	
5	*The ATCO team assesses the delay request against the flight's current status.*	O	
6	*The ATCO team issues appropriate clearance(s) to action the delay request where able (considering separation management and other tasks that may take priority).*	O	
7	*The current clearance data is updated by the current controlling unit, to reflect any instructions issued by the ATCO, and shared*	S	FSMG.0034 (+CTA req not yet defined)
8	*The IOP trajectory is recomputed, including ETA for the destination airfield*	S	FSMG.0002
9	*AMAN accesses clearance data and/or ETA as feedback that delaying action has been performed*	S	
10	*The flight is handed over to the next ATSU, use case returns to step 2*	O	

Table 109: Operating Method for AMAN (Indication of TTL/TTG & XMAN delay sharing)

3.3.3 Advantages of IOP (IOP over OLDI, Performance including KPIs)

3.3.3.1 Trajectory Prediction

The first available source for a trajectory in an FDPS is the filed flight plan. The sequence of centres and sectors that will handle the flight is derived using the trajectory. Currently, ATC change messages (AFP) are sent to NM and the updated plans are distributed (including when this impacts the control centre sequence). However, this is relatively static and with a scope limited to: change of route, diversion, change of requested cruising level, change of aircraft type, change of flight rules, of flight type and of aircraft equipment. By using the FO to update the trajectory to match what the controllers intent is allows the information to be displayed to the centres (and internally to the sectors when needed) who need it, rather than to rely on coordination and unnecessary inputs being made by controllers to re-route flight information.

This information, as it is available at an early stage of the flight, also allows other tools to be enhanced with more accurate data, e.g. planning and flow management tools. Sector demand and capacity balancing has become a major challenge, the better the trajectories feeding these tools the better the airspace can be sectorised to meet the expected flows of traffic and controllers allocated to sectors where they are needed. IOP supports the defined SBT (Shared Business Trajectory) Concept of Operation. The publication of the Flight Object can distribute the SBT during the SAP and transition into the RBT (Reference Business Trajectory) according to agreed procedures.

3.3.3.2 Coordination

The flight object has the capability to replace OLDI providing the complete functionality and the possibility to extend beyond the OLDI features. During the initial implementation it is expected that only the existing OLDI features will be deployed and with experience the full possibilities of the flight object will be exploited.

The FO therefore provides the means to reduce the workload considerably by removing a lot of the verbal coordination interactions during the CAP and allowing the continuous update of flight information to be displayed to the controllers. With the FO all inputs upstream are available, if required the label in the next centre can be updated with tactical inputs made by the previous centre. This gives the next centre the situational awareness lacking from OLDI allowing the CAP to be used to indicate an agreed set of data and locally to decide if changes to that data are brought to the attention of the controller or other positions as necessary.

In case of adverse weather conditions next to the boundary, many traffic may be rerouted to an unplanned unit. With IOP this unplanned unit will immediately have all information about all new incoming traffic and this will make telephone coordination much easier

For the time being it is still required to maintain a phase (NP) near the boundary where any changes need to be negotiated. This is standard ATC practice where changes near to a handover, centre or sector, must be agreed.

3.3.3.3 Medium Term Conflict Detection

MTCD extrapolates the planned path of the flight according to the flight plan and controller inputs with a typical horizon of 20 minutes. In this way it extrapolates the plan rather than the track as is done in safety nets such as the Short Term Conflict Alert or “Probing” tools. However currently the start of the plan is only really known when the aircraft is correlated, before this it is taken from the “guess” of where the flight will be from the snap-shot taken at the activation event.

Not only are current MTCDs limited by the guess of the aircraft performance and intent they are also compromised by the starting conditions and at entry in to a centre are unreliable.

As stated above if the FO is considered to be updating the flight plan data like radar updates the track data the MTCD will be using an accurate source. There are not only substantial safety benefits as controllers will be able to assess conflicts presented to them as real, rather than have to go through the first assessment of "is it real?". This means that the potential conflicts will be solved at an earlier stage in the strategic de-confliction process increasing the number of options to optimise the preferred solution as well providing time, and hence airspace volume to manoeuvre. However it also benefits flights since the number of controller actions on each flight is reduced having less impact on the increased number of miles flown or the use of a sub optimal flight level.

4 Safety, Performance and Interoperability Requirements (SPR-INTEROP)

4.1 Assumptions

The following assumptions are applicable to the interoperability requirements stated in this specification. Assumptions Applicable to the Interoperability Requirements

No.	Assumption
1	Flight identification information is not explicitly stated within the information exchange requirements. It is assumed that the stakeholders involved can uniquely reference and identify the flight to which the information pertains.
2	Stakeholders have access to consistent aeronautical information (Common definition of points and aerodromes, airways and airspaces)

Table 110: Assumptions Applicable to the Interoperability Requirements

4.2 Naming Convention

The following requirements naming convention is used in this INTEROP. The 4 letter descriptor (e.g. COTR) is coordinated with Technical Specification. The 4 digits specific to each requirement are matched to those used in each analysis team feature document.

Note that this list covers all IOP features; not all of which have been addressed in this INTEROP.

Feature #	Feature Topic	Requirement Id
1	Coordination and Transfer	REQ-18-02b-SPRINTEROP-**COTR**.000x
2	FO Flight Script management	REQ-18-02b-SPRINTEROP-**FSMG**.000x
3	Informative distribution between systems	REQ-18-02b-SPRINTEROP-**INFO**.000x
4	FO protocol failures & Desynchronization	REQ-18-02b-SPRINTEROP-**PRFA**.000x
5	Control sequence handling	REQ-18-02b-SPRINTEROP-**SEQM**.000x
6	IOP recovery	REQ-18-02b-SPRINTEROP-**RECO**.000x
7	Manual FO correction	REQ-18-02b-SPRINTEROP-**MACO**.000x
8	SSR codes	REQ-18-02b-SPRINTEROP-**SSRC**.000x

9	FO mechanism - general	REQ-18-02b-SPRINTEROP-**MECH**.000x
	FO mechanism - WIFO	REQ-18-02b-SPRINTEROP-**WIFO**.000x
	FO mechanism - SWIM	REQ-18-02b-SPRINTEROP-**SWIM**.000x
10	Scope and management of FO trajectory	REQ-18-02b-SPRINTEROP-**SCTJ**.000x
11	Arrival and departure management	REQ-18-02b-SPRINTEROP-**ADMG**.000x
12	Original FP data	REQ-18-02b-SPRINTEROP-**FPMG**.000x
14	IOP support to air/ground synchronization	REQ-18-02b-SPRINTEROP-**AGSY**.000x

Table 111: Naming convention

4.3 Requirements for Interoperability

In addition to attributes defined in the SESAR 2020 guidelines, the attribute field "Implementation" has been added to the requirement table template.

The Implementation attribute field can have the following values:

- Mandatory: Needs to be implemented when the FO-IOP solution is deployed.
- Optional: This requirement may not be implemented when FO-IOP is deployed.

  But, in some cases optional requirements cannot be implemented independently:

  - An optional requirement may only be implemented if an other one is implemented
  - Some optional requirements may have to be implemented in bulk to correctly implement an optional functionality

In the following requirements, some terms refer to the definitions hereafter:

- Responsible Entity (RE):

  Person or group of persons in charge of a defined responsibility in ATM who may play a role in the IOP seamless coordination.

  For example, it includes:

  - Planner & Executive ATCOs dealing with one or several collapsed sectors,
  - The executive ATCO in charge of some flights inside a sectorless environment,

- The executive ATCO and its associated Planner in a Multi Sector Planner environment,
- An Extended ATC Planner (INAP function),
- A Flow Management Position,
- ...

In this document the term “sharing information between REs” or “having the information available to REs” is only meant to ensure that the information is available at the other unit in order to be displayed to the appropriate RE, without any obligation to display or usage of that information, unless explicitly required in a specific requirement.

- Transferring Unit:

  The upstream IOP Unit involved in a planned transfer of communication among two IOP Units. This IOP Unit is consequently expected to control the flight. It includes a Delegatee IOP Unit but excludes a skipped or a No_Contact IOP Unit. One or several skipped or No_Contact IOP Units may be present between the Transferring Unit and the Receiving Unit. The C&T data associated to the term "*Transferring Unit*" are always the C&T data of the downstream boundary of this Unit.

- Receiving Unit:

  The downstream IOP Unit involved in a planned transfer of communication among two IOP Units. This IOP Unit is consequently expected to control the flight. It includes a Delegatee IOP Unit but excludes a skipped or a No_Contact IOP Unit. One or several skipped or No_Contact IOP Units may be present between the Transferring Unit and the Receiving Unit. The C&T data associated to the term "*Receiving Unit*" are always the C&T data of the upstream boundary of this Unit.

- Transferring RE:

  The RE determined by the Transferring IOP Unit as the one expected to perform the frequency change to the Receiving RE.

- Receiving RE:

  The RE determined by the Receiving IOP Unit as the one expected to assume the flight after a frequency change has been performed by the Transferring RE.

The requirements are listed below according to their functionalities:

4.3.1 IOP General Mechanisms

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**IOP General Mechanisms**						

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	GENE.0015-Flight Object creation conditions (by ATC)
		M	GENE.0008-Flight object actors
		M	GENE.0011-Eligibility to modify Flight Object infromation
		M	GENE.0012-Availability of information on Flight Object
		M	GENE.0013-Vicinity crossing
		M	GENE.0014-Update of information on a flight
		M	GENE.0005-Update based on non-IOP units input

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0015
Title	Flight Object creation conditions (by ATC)
Requirement	Flight Object **shall** be created whenever the following conditions are fulfilled: • Flight plan exist in the local database • Flight Object doesn't exist for the same flight plan data. • Flight is planned to cross the IOP Area
Status	<Validated>
Rationale	It is preferable that the first FO is created by the first crossed IOP unit in the sequence.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0008
Title	Flight object actors
Requirement	The Flight Object **shall** allow ATS Units controlling or expecting to control the flight to concurrently update relevant information of the Flight Object.
Status	<Validated>
Rationale	Flight object provides a means to share any control actions or planning information related to the flight.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0011
Title	Eligibility to modify Flight Object information
Requirement	Only the following entities shall be allowed to modify information impacting the flight trajectory: - The unit controlling the flight - Any unit expected to control the flight
Status	<Validated>
Rationale	Only unit actively involved to control the flight are eligible to modify it.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0012
Title	Availability of information on Flight Object
Requirement	An IOP Unit expected to control the flight **shall** receive up-to-date information on the flight
Status	<Validated>
Rationale	An IOP Unit expected to control the flight must be aware of any change to the flight crossing its airspace
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0013
Title	Vicinity crossing
Requirement	An IOP Unit expected to be in the vicinity of the flight **shall** receive up-to-date information on the flight
Status	<Validated>
Rationale	If an aircraft is expected to fly near the IOP Unit boundary, this IOP Unit must have information about this flight.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0014
Title	Update of information on a flight
Requirement	An IOP Unit expected to control a flight **shall** be able to update information related to the traversal of its AOR by the flight
Status	<Validated>
Rationale	Planning information can be updated as soon as available.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0005
Title	Update based on non-IOP units input
Requirement	An IOP unit involved in the flight management **shall** be able to update shared flight data according to the data provided to that IOP Unit by non-IOP units involved in the flight management
Status	<Validated>
Rationale	A Unit involved in the flight management is a unit that is in the control sequence. Such a unit is expected share all the information available at a certain moment in order to keep the shared data updated for all the other units involved in the flight management. The subject information may come from non-IOP Units as well, via e.g. OLDI, AFTN (for NM), etc.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.2 IOP Data Distribution

4.3.2.1 General Distribution

This feature provides the mechanisms to distribute flight object information to all subscribers, either based on the fact that their airspace is crossed by the trajectory or based on other mechanisms, such as crossing of AOI, use of specific functions to highlight a Flight Object to a non crossed IOP Unit, or any other ad hoc rules.

INTEROP CHAPTERS									
REQUIREMENTS FOR INTEROPERABILITY	M	**IOP DATA DISTRIBUTION**	M	**General Distrubution**					

IMPLEMENTATION RULE			BASIC IOP REQUIREMENTS
		M	GENE.0001-General sharing
		M	GENE.0002-Access to shared information
		M	GENE.0003-Filed FPL data sharing

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0001
Title	General sharing
Requirement	An IOP Partner **shall** share information about flights he is predicted to control, with other partners interested by this flight.
Status	<Validated>
Rationale	All information will be shared between all partners
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0002
Title	Access to shared information
Requirement	An IOP Unit **shall** have access to any shared information about a flight he is interested in (AoI crossed)
Status	<Validated>
Rationale	All partners need to be able to access IOP information.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0003
Title	Filed FPL data sharing
Requirement	IOP Units **shall** share the filed FPL data.
Status	<Validated>
Rationale	FPL data is useful to IOP Units to see the changes compared with the actual flight plan shared through the FO.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.2.2 Specific Distribution

INTEROP CHAPTERS									
REQUIREMENTS FOR INTEROPERABILITY	M	**IOP DATA DISTRIBUTION**	M	**Specific Distribution**					

IMPLEMENTATION RULE		BASIC IOP REQUIREMENTS	
		M	SEQM.0006-Vicinity Distribution
		O	SEQM.0007-Distribution outside AOI
It requires the implementation of SEQM.0010		O	SEQM.0009-FO subscription
It requires the implementation of SEQM.0009		O	SEQM.0010-FO Un-subscription

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0006
Title	Vicinity Distribution
Requirement	Up-to-date information of the traffic **shall** be shared with any IOP unit having its Area Of Interest (AOI) traversed.
Status	<Validated>
Rationale	An IOP Unit can receive flight information for flights which cross their AoI but not the AoR.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0007
Title	Distribution outside AOI
Requirement	Up-to-date information on specific flights which do not cross one IOP Unit's Area of Interest **shall** be shared with this unit according to bilaterally agreed rules.
Status	<Validated>
Rationale	Rationale An IOP Unit needs to be able to receive flight information based on bilaterally agreed rules. Local rules will determine to which RE the flight information will be displayed.
Category	<IER><Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0009
Title	FO subscription
Requirement	An IOP Unit **shall** be able to subscribe to up-to-date information.
Status	<Validated>
Rationale	An IOP Unit should be able to subscribe to receive flight information.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of SEQM.0010

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0010
Title	FO Un-subscription
Requirement	An IOP Unit **shall** be able to un-subscribe from a given flight that it previously subscribed to.
Status	<Validated>
Rationale	When information is no longer needed the subscription needs to be able to be cancelled.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of SEQM.0009

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.2.3 Crossed IOP Units

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**IOP DATA DISTRIBUTION**	M	**Crossed IOP Units**				

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		M	SEQM.0011-Crossed IOP Units R/W access
		M	SEQM.0012-Change of crossed IOP Unit

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0011
Title	Crossed IOP Units R/W access

Requirement	An IOP Unit whose Area of Responsibility is crossed by the flight **shall** have read and write access to up-to-date information for that flight.
Status	<Validated>
Rationale	IOP Unit whose airspace is crossed need to receive flight information and to be able to contribute to its improvement.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0012
Title	Change of crossed IOP Unit
Requirement	The sequence of IOP Units that are crossed by the flight **shall** be updated to be in line with the changes of the flight's trajectory.
Status	<Validated>
Rationale	A controlling IOP Unit can change the sequence of IOP Units who will be physically crossed by the flight by modifying the route. There can be multiple entries due to re-entrant flights.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.2.4 Removal of an IOP Unit

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**IOP DATA DISTRIBUTION**	M	**Removal of an IOP Unit**				

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	SEQM.0096-Removal from the IOP control sequence

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0096

Title	Removal from the IOP control sequence
Requirement	An IOP Unit removed from the IOP control sequence, as a consequence of: • A trajectory change, or • A control sequence change, or • A cancellation of the flight, **Shall** be made aware of the new situation and of the reason of the removal.
Status	<Validated>
Rationale	The operator (ATCO, FMP…) should be made aware of the removal.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.2.5 Controlling IOP Units

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**IOP DATA DISTRIBUTION**	M	**Controlling IOP Units**				

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		M	SEQM.0014-Information to delegatee IOP Unit
		M	SEQM.0040-Amendment of the sequence of controlling IOP Units
		M	SEQM.0015-Receiving IOP Unit not aligned with trajectory
		M	SEQM.0059-No longer crossed controlling IOP Unit
		M	SEQM.0097-Controlling RE publication

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0014
Title	Information to delegatee IOP Unit
Requirement	A Delegatee IOP Unit **shall** have Read & Write access to up-to-date information.
Status	<Validated>
Rationale	Flight information is needed to control the flight by delegation.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0040

Title	Amendment of the sequence of controlling IOP Units
Requirement	The sequence of controlling IOP Units **shall** be based on the geographical sequence created upon the IOP trajectory and amended according to the implemented skip(s) and delegation(s).
Status	<Validated>
Rationale	The sequence of controlling IOP Units is initially the sequence of crossed IOP Units from the IOP trajectory enhanced by SKIP, DELEGATE, FORCE-ASSUME, and local rules.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0015
Title	Receiving IOP Unit not aligned with trajectory
Requirement	A Transferring IOP Unit **shall** be able to change its Receiving IOP Unit either: • By inserting this IOP Unit in the control sequence, • By removing the former Receiving IOP Unit, • Or by replacing the former Receiving Unit.
Status	<Validated>
Rationale	Based on LoA or manual inputs, the control sequence is imposed irrespective of the trajectory prediction (e.g. for certain flows).
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0059
Title	No longer crossed controlling IOP Unit
Requirement	The controlling IOP Unit **shall** always be in the control sequence.
Status	<Validated>
Rationale	Even if the controlling IOP Unit is no longer crossed because of a route change avoiding its airspace, it must remain in the control sequence.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0097
Title	Controlling RE publication
Requirement	The controlling RE **shall** be shared.
Status	<Validated>
Rationale	For coordination purposes, every RE involved in the management of the flight should be able to know which RE is in contact with the aircraft. This is also important for the stolen one after a force-assumption.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3 Coordination and Transfer

This section describes the operating concept for coordination and transfer.

The Coordination and Transfer mechanisms used in IOP are derived from those of full OLDI, but offer additional functionalities and flexibility.

During coordination, a set of coordination data is managed for any boundary, first initialized thanks to offline adaptation representing LOA's, then updated through controller dialogue.

Basic IOP functionalities in this feature include:

- Management of SAP/CAP/NP phases
- Automatic and Manual triggering of CAP/NP phase
- Reversion to previous phase (SAP or CAP)
- Modification of coordination data during all phases
- Transfer functionality (COF/ROF/Assume)
- Unusual actions in transfer, such as UNDO-SEND and FORCE-ASSUME
- Point a flight to another unit
- Negotiation of coordination data during all phases

Main Functionalities Of Coordination And Transfer

The main functionalities of C&T in Basic IOP are illustrated below:

- **NOMINAL COORDINATION PROCESS**

The steps of the nominal coordination process are shown below:

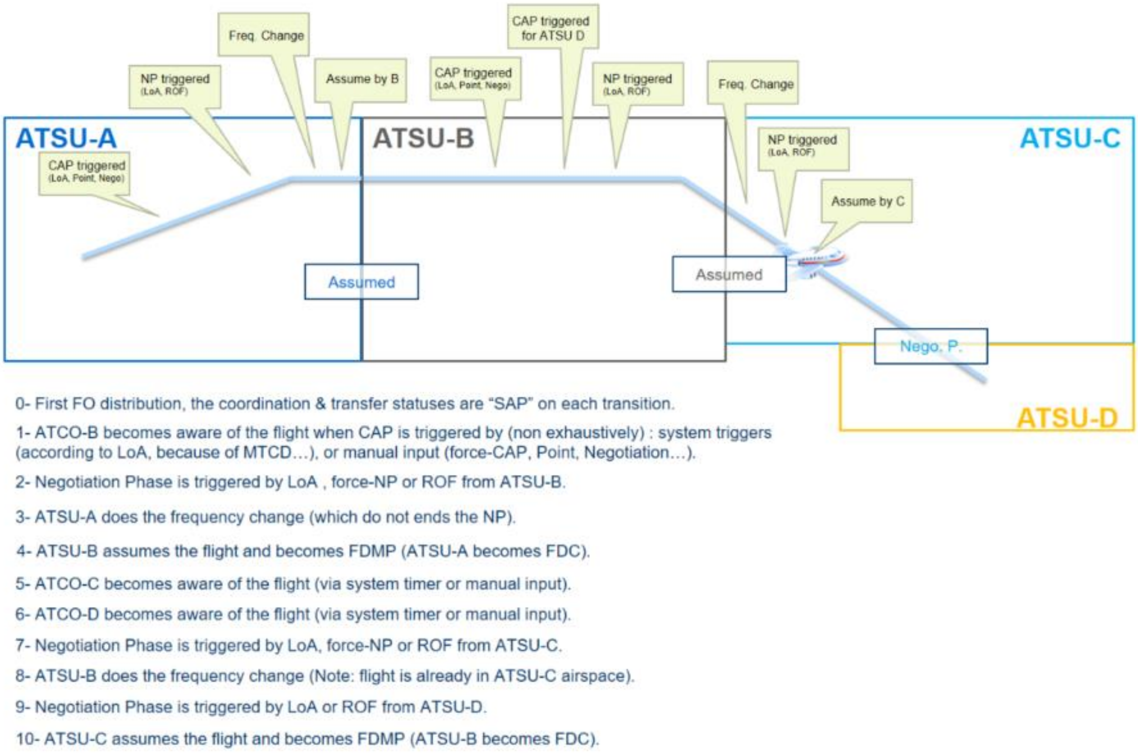
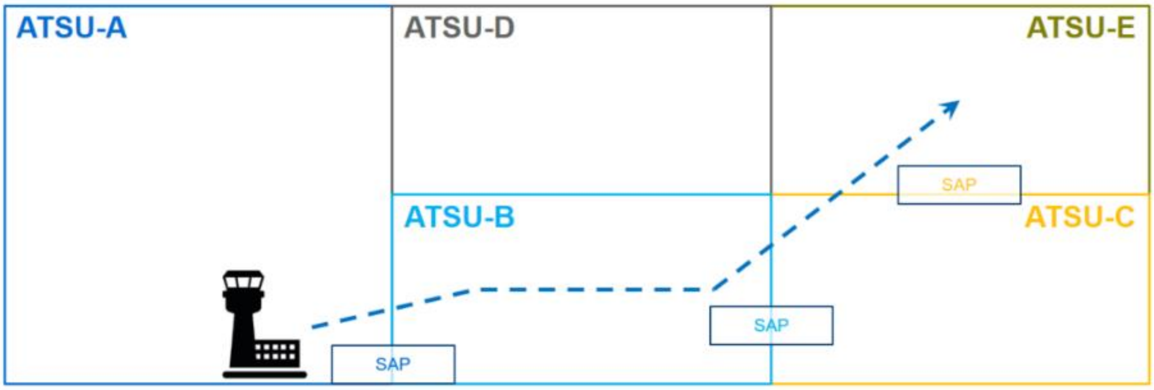


Figure 39: The steps of the nominal coordination process

- **COORDINATION POSTPONING**



0- First FO distribution, the coordination & transfer statuses are "SAP" on each transition.

1- Flight is going to take-off, expected take-off time triggers the CAP and NP according to the expected flight time (airfield close to boundary).

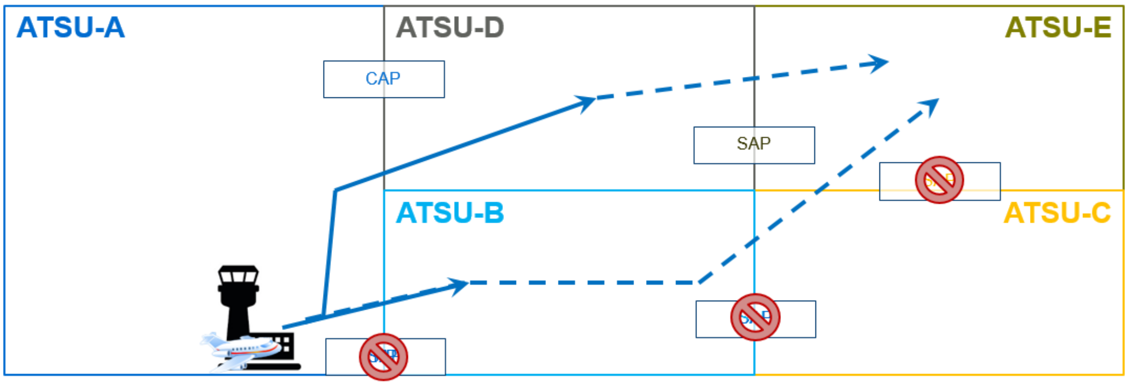
2- Flight is delayed or take-off time is no longer predictable. Coordination is postponed and reverts to SAP for all ATSU.

Note 1 : It should be local decision for each crossed ATSU (or LoA parameter), based on the estimated entry time in its airspace updated in the FO, to send a request to the FDMP to revert to the SAP as the FDMP might not know what delay would justify it for ATSU-C.

Note 2 : An ATSU can revert to SAP only if :
- its downstream ATSU is not in CAP or NP (already in SAP),
- the conditions to trigger automatically the CAP are no longer respected.

Figure 40: Coordination Postponing

- **COORDINATION ABROGATION**



0- First FO distribution, the coordination & transfer statuses are "SAP" on each transition.

1- Flight is going to take-off, take-off time triggers the CAP and NP in ATSU-A and ATSU-B according to the expected flight time (airfield close to boundaries).

2- Flight is airborne and is now rerouted via ATSU-D and ATSU-E :
- Coordinations are <u>abrogated</u> with ATSU-B and ATSU-C,
- New coordinations are created with ATSU-D and ATSU-E and updated according to the flight progress,
- Control sequence list was A-B-C-E and becomes A-D-E,

Figure 41: Coordination Abrogation

- **UNDO-SEND**

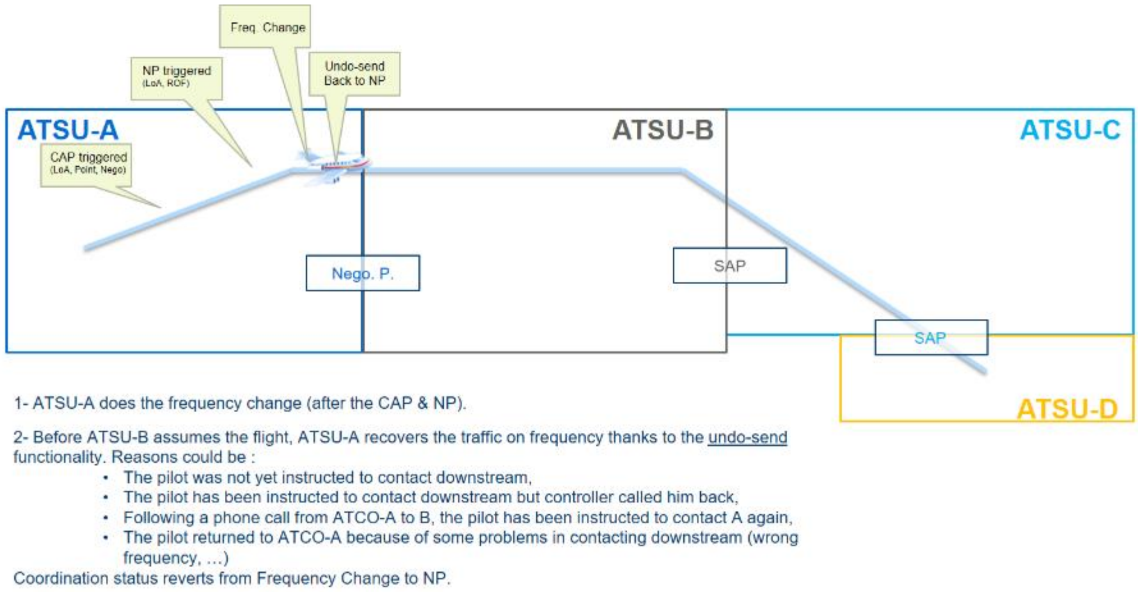


Figure 42: Undo-Send

- **FORCE-ASSUME AND UNDO FORCE-ASSUME**

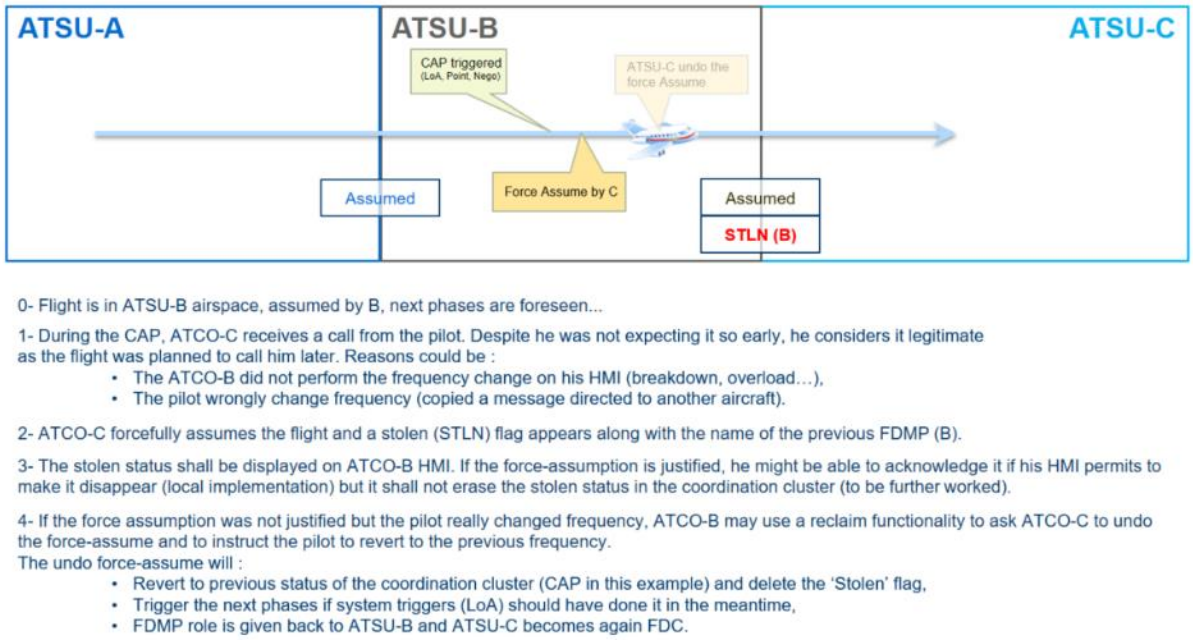


Figure 43: Force assume and undo force-assume

4.3.3.1 Flight Phase

4.3.3.1.1 Phase lifecycle

IOP mechanisms provide a continuous flow of updated information since the first Flight Object (FO) publication. This FO is expected to be enriched by contributions from all the traversed IOP Units according to their local constraints. However, these contributions can only be added if the concerned System Instance has derived from the FO an internal System Flight Plan (SFPL) or local flight plan used for other purposes which can be processed, enriched with local constraints and resynchronized with the FO.

FOs are expected to be created several hours before departure.

To avoid system overloads (cumulating for instance morning and evening peak hours) each IOP Unit will determine the moment when its internal flight plan becomes synchronized with the FO. This moment is known as the beginning of the System Awareness Phase.

The SAP is set for each flight and is related to the whole IOP Unit which means it is not linked to a specific boundary of this System Instance. On the other hand, Controller Awareness Phase and Negotiation Phase are related to a specific boundary between two sectors of different IOP Units and as a consequence, the triggers of CAP and NP for different boundaries of an IOP Unit are independent.

In the SAP, the controller of the upstream IOP Unit doesn't know if the controller of the downstream IOP Unit is aware of the flight (it is a local decision to display or not the flight on the downstream HMI.

The SAP is considered as the period of time when the flight is of interest to the FDPS for any function (Demand Capacity Balancing, Sector Workload Management, Traffic Synchronisation, Separation Management …) and not yet of interest to any sector ATCO under this FDPS. That's the reason why, despite it may be decided locally to display part of the available information, ATCOs are not yet expected to take into account trajectory or coordination changes.

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Flight Phase**	M	**Phase Lifecycle**		

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	GENE.0004-Action when entering the SAP
		M	COTR.0001 - SAP status of an IOP Unit
		M	COTR.0006-Availability of the CAP status
		M	COTR.0007-CAP triggering
		M	COTR.0016-NP sharing
		M	COTR.0017-NP triggering
		M	COTR.0020-Negotiation Phase end
		M	COTR.0023-Reversion to SAP
		O	COTR.0131-Reversion to CAP

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-GENE.0004
Title	Action when entering the SAP
Requirement	An IOP Unit entering in SAP for a flight **shall**: • Check if flight data are already shared by another IOP Unit about this flight, • Create or consolidate, and share flight data based on local knowledge, • Synchronize its local view of the flight with the current shared flight data.

Status	<Validated>
Rationale	An IOP Unit entering the SAP for a flight must synchronize itself with an existing Flight data.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0001
Title	SAP status of an IOP Unit
Requirement	An IOP Unit **shall** share it is in SAP for the related flight.
Status	<Validated>
Rationale	The trajectory accuracy depends on the IOP Partners’ contributions, which are only required in the System Awareness Phase.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

The Controller Awareness Phase is a status related to a specific (horizontal or vertical) boundary between two subsequent sectors (of different IOP Units) in the control sequence and qualifies the awareness of these two sectors.

An ATCO is considered aware of the flight when the flight is displayed on its HMI and that nominal functionalities are available.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0006
Title	Availability of the CAP status
Requirement	The Controller Awareness Phase (CAP) status **shall** be available for other IOP Units.
Status	<Validated>
Rationale	The ATCOs’ awareness is a prerequisite of any coordination.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0007

Title	CAP triggering
Requirement	Unless already triggered or already in NP, the CAP **shall** be triggered automatically according to LoAs parameters (combination of time, distance or level from the boundary).
Status	<Validated>
Rationale	ATCOs need to anticipate their awareness before the entry in their airspace, based on bilateral agreements. It is valid for any Unit expected to control the flight (crossed or delegatee) but not skipped. It's also valid for a No_Contact Unit as the No_Contact RE remains responsible for the coordination. It is expected that some implementation may not allow entry in CAP phase unless the upstream boundary is also in CAP.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

The Negotiation Phase linked to a specific boundary is made to inform ATCOs not to change C&T data or flight script without negotiation when the flight is quite close to the boundary or to the frequency change. It indicates to both IOP Units that any C&T data change (either by upstream or by downstream) is expected to be negotiated (either verbally or electronically). It is triggered according to parameters defined in a Letter of Agreement or can be activated manually if one of the ATCOs wants to be informed in case of change in his situational awareness.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0016
Title	NP sharing
Requirement	The Negotiation Phase (NP) status **shall** be available for other IOP Units.
Status	<Validated>
Rationale	Downstream & upstream must have a consistent view of the current phase.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0017
Title	NP triggering
Requirement	Unless already triggered, the NP **shall** be triggered automatically according to LoAs parameters (combination of time, distance or level from the boundary).

Status	<Validated>
Rationale	The NP exists to ensure ATCOs negotiate changes close to the boundary.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0020
Title	Negotiation Phase end
Requirement	The Negotiation Phase **shall** end when the Receiving Unit assumes the flight.
Status	<Validated>
Rationale	The frequency change must not be considered as the end of the NP.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

An unexpected or undetermined delay might justify reverting the coordination to SAP. It is however internal decision based on the revised entry conditions.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0023
Title	Reversion to SAP
Requirement	The reversion from CAP or NP to SAP **shall** be triggered when the LoA conditions are no longer fulfilled.
Status	<Validated>
Rationale	CAP should be consistent with the progress of the flight. A too much delayed flight should not remain in CAP.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0131
Title	Reversion to CAP
Requirement	A coordination phase **shall** only revert from NP to CAP when both involved IOP Units allow.
Status	<Validated>

Rationale	A route amendment could justify reverting from NP to CAP if the time to the boundary significantly increased. However, this decision cannot be made unilaterally, as each system might introduce buffers locally to avoid phase instability.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.1.2 Manual Trigger

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Flight Phase**	O	**Manual Trigger**		

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		O	COTR.0013-Force-CAP by upstream
		O	COTR.0014-Force-CAP by downstream
		O	COTR.0022-Force-NP by the Transferring RE
		O	COTR.0021-Force-NP by the Receiving RE

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0013
Title	Force-CAP by upstream
Requirement	Unless already in NP or CAP, the Transferring IOP Unit **shall** be able to trigger the CAP.
Status	<Validated>
Rationale	For instance, to start a verbal or electronic coordination (Force-CAP functionality).
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0014
Title	Force-CAP by downstream
Requirement	Unless already in NP or CAP, the Receiving IOP Unit **shall** be able to trigger the CAP.
Status	<Validated>
Rationale	For instance to start a verbal or electronic coordination (Force-CAP functionality).

Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0022
Title	Force-NP by the Transferring RE
Requirement	The Transferring IOP Unit **shall** be able to trigger the Negotiation Phase.
Status	<Validated>
Rationale	Transferring IOP Unit may want to prevent the receiving IOP Unit to require (without negotiation) for an unexpected change in the transfer conditions which would jeopardize his current strategy.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0021
Title	Force-NP by the Receiving RE
Requirement	The Receiving IOP Unit **shall** be able to trigger the Negotiation Phase.
Status	<Validated>
Rationale	Receiving IOP Unit must be able to freeze the current transfer conditions to guarantee an unexpected change would not jeopardize his strategy.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2 Coordination and Transfer Data

The coordination and the transfer conditions between two successive IOP Units of the control sequence must rely on pieces of information called C&T data (Coordination & Transfer data).

These data are spread into three groups:

1. The C&T Contractual data (TFL, SFL, Heading, Direct, Speed, ROC/ROD) 4.3.3.2.1

These data are the data agreed by the Transferring RE and the Receiving RE to coordinate the flight transfer. They can be set by the system according to a Letter of Agreement and can also be set manually by the REs. Their modification should also be negotiable.

2. The C&T Unit Data (transferring and receiving frequency and RE identification) **Error! Reference source not found.**

   These data are related to a specific IOP Unit and shared to ease the process of transfer of control. These data are not negotiable. Even if they might be set by another IOP Unit, in case of disagreement, the IOP Unit in charge of these data should have the final say.

3. The C&T Functional data defined in requirement4.3.3.2.3

   These data are additional pieces of information related to a transfer of control between two IOP Units. They indicate statuses and actions performed by either the Transferring RE or the Receiving RE and provide the required information in case of skipped or No_Contact RE(s) between the Transferring and Receiving ones. These data are not negotiable.

4.3.3.2.1 Coordination and Transfer Contractual Data

4.3.3.2.1.1 Level

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	M	**C&T Contractual Data**	M	**Level**

IMPLEMENTATION RULE			*BASIC IOP REQUIREMENTS*
		M	COTR.0027-C&T Contractual Data TFL
Mandatory when SFL C&T implemented		O	COTR.0137-C&T Contractual Data SFL
		M	COTR.0028-Modification of TFL by upstream
Mandatory when SFL C&T implemented		O	COTR.0148-Modification of SFL by upstream
		M	COTR.0183-Modification of TFL by downstream
Mandatory when SFL C&T implemented		O	COTR.0184-Modification of SFL by downstream

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0027
Title	C&T Contractual Data TFL
Requirement	The C&T Contractual data Transfer Flight Level (TFL) with indication of the type of transition (Wall or Layer) **shall** be shared between the Transferring, Receiving and No_Contact REs.
Status	<Validated>
Rationale	TFL is a mandatory coordination data to be shared.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0137
Title	C&T Contractual Data SFL
Requirement	The C&T Contractual data Supplementary Flight Level (SFL) **shall** be shared between the Transferring, Receiving and No_Contact REs.
Status	<Validated>
Rationale	In Basic IOP, IOP Units should be able to use an SFL as coordination data.
Category	<IER><Interoperability>
Implementation	Optional – Mandatory when SFL C&T implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0028
Title	Modification of TFL by upstream
Requirement	The Transferring RE **shall** be able to modify the C&T Contractual data TFL.
Status	<Validated>
Rationale	In Basic IOP, the systems should be able to offer to REs the possibility to modify the TFL.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0148
Title	Modification of SFL by upstream
Requirement	The Transferring RE **shall** be able to modify the C&T Contractual data SFL
Status	<Validated>
Rationale	In Basic IOP, the systems should be able to offer to REs the possibility to modify the SFL.
Category	<Interoperability>
Implementation	Optional – Mandatory when SFL C&T implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

For some centres, it is considered unacceptable that a downstream centre modifies the transfer level without negotiation, as this would imply imposing to the upstream a clearance to provide to the aircraft. That is why in the following requirements on TFL and SFL modification, the modification from the downstream can be disabled based on LOA's.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0183
Title	Modification of TFL by downstream
Requirement	The Receiving RE **shall** be able to modify the C&T Contractual data TFL as per bilateral agreement.
Status	<Validated>
Rationale	Bilateral agreement should determine if downstream can modify C&T data without negotiation.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0184
Title	Modification of SFL by downstream
Requirement	The Receiving RE **shall** be able to modify the C&T Contractual data SFL as per bilateral agreement.
Status	<Validated>
Rationale	Bilateral agreement should determine if downstream can modify C&T data without negotiation.
Category	<Interoperability>
Implementation	Optional – Mandatory when SFL C&T implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.1.2 Heading

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	M	**C&T Contractual Data**	O	**Heading**

IMPLEMENTATION RULE			BASIC IOP REQUIREMENTS
Mandatory when Heading C&T implemented		O	COTR.0138-C&T Contractual Data Heading
It requires the implementation of COTR.0138		O	COTR.0149-Modification of Heading by the Transferring RE
It requires the implementation of COTR.0138		O	COTR.0153-Modification of Heading by the Receiving RE

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0138
Title	C&T Contractual Data Heading
Requirement	The C&T Contractual data Heading (value and direction) **shall** be shared between the Transferring, Receiving and No_Contact REs.
Status	<Validated>
Rationale	In Basic IOP, IOP Units should be able to use a Heading as coordination data.
Category	<IER><Interoperability>
Implementation	Optional – Mandatory when Heading C&T implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0149
Title	Modification of Heading by the Transferring RE
Requirement	The Transferring RE **shall** be able to modify the C&T Contractual data heading.
Status	<Validated>
Rationale	In Basic IOP, the systems should allow the Transferring RE to modify this C&T data.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.0138

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0153
Title	Modification of Heading by the Receiving RE
Requirement	The Receiving RE **shall** be able to modify the C&T Contractual data heading as per bilateral agreement.
Status	<Validated>
Rationale	Bilateral agreement should determine if downstream can modify C&T data without negotiation.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.0138

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.1.3 Speed

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	COORDINATION & TRANSFER	M	Coordination and Transfer Data	M	C&T Contractual Data	O	Speed

IMPLEMENTATION RULE		BASIC IOP REQUIREMENTS
Mandatory when Speed C&T implemented	O	COTR.0140-C&T Contractual Data Speed
It requires the implementation of COTR.0140	O	COTR.0150-Modification of Speed by the Transferring RE
It requires the implementation of COTR.0140	O	COTR.0154-Modification of Speed by the Receiving RE

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0140
Title	C&T Contractual Data Speed
Requirement	The C&T Contractual data Speed (≥, ≤, =, lowest, highest) **shall** be shared between the Transferring, Receiving and No_Contact REs.
Status	<Validated>
Rationale	In Basic IOP, IOP Units should be able to use a Speed as coordination data.
Category	<IER><Interoperability>
Implementation	Optional – Mandatory when Speed C&T implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0150
Title	Modification of Speed by the Transferring RE
Requirement	The Transferring RE **shall** be able to modify the C&T Contractual data speed.
Status	<Validated>
Rationale	In Basic IOP, the systems should allow the Transferring RE to modify this C&T data.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.0140

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0154
Title	Modification of Speed by the Receiving RE
Requirement	The Receiving RE **shall** be able to modify the C&T Contractual data speed as per bilateral agreement.
Status	<Validated>

Rationale	Bilateral agreement should determine if downstream can modify C&T data without negotiation
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.0140

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.1.4 Direct

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	M	**C&T Contractual Data**	O	**Direct**

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
Mandatory when any DCT Requirement is implemented	CORE	O	COTR.0139-C&T Contractual Data Direct
Mandatory when any DCT Requirement is implemented	CORE	O	COTR.0208-DCT from a route point
Mandatory when any DCT Requirement is implemented	CORE	O	COTR.0209- DCT from current position
It requires the implementation of DCT C&T core requirements		O	COTR.0030-C&T Contractual Data Direct Modification by transferring RE
It requires the implementation of DCT C&T core requirements		O	COTR.0189-C&T Contractual Data Direct Modification by receiving RE

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0139
Title	C&T Contractual Data Direct
Requirement	The C&T Contractual data Direct **shall** be shared between the Transferring, Receiving and No_Contact REs.
Status	<Validated>
Rationale	In Basic IOP, IOP Units should be able to use a Direct as coordination data.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any DCT Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0208
Title	DCT From a Route Point
Requirement	When the C&T Data DIRECT specifies a DCT from a route point, the modification of the route resulting from the DIRECT **shall** be reflected immediately on the shared flight script.
Status	<Validated>
Rationale	IOP Units will be able to insert DCT from a route point.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any DCT Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0209
Title	DCT From Current Position
Requirement	When the C&T Data DIRECT specifies a DCT from Current position, the shared flight script **shall** only be modified after the DIRECT is cleared to the aircraft.
Status	<Validated>
Rationale	IOP Units will be able to insert DCT from current position.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any DCT Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0030
Title	C&T Contractual Data Direct Modification by transferring RE
Requirement	The Transferring RE **shall** be able to modify the following C&T Contractual data direct.
Status	<Validated>
Rationale	C&T contractual data direct must be modify by the transferring RE.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of DCT C&T core requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0189
Title	C&T Contractual Data Direct Modification by receiving RE
Requirement	The receiving RE **shall** be able to modify the C&T Contractual data direct.
Status	<Validated>
Rationale	C&T contractual data direct must be modify by the receiving RE.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of DCT C&T core requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.1.5 ROC/ROD

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	M	**C&T Contractual Data**	O	**ROC/ROD**

IMPLEMENTATION RULE			*BASIC IOP REQUIREMENTS*
Mandatory when any ROC/ROD Requirement is implemented	CORE	O	COTR.0141-C&T Contractual Data Rate
It requires the implementation of ROC/ROD C&T core requirements		O	COTR.0151-Modification of the Rate by the Transferring RE
It requires the implementation of ROC/ROD C&T core requirements		O	COTR.0155-Modification of the Rate by the Receiving RE

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0141
Title	C&T Contractual Data Rate
Requirement	The C&T Contractual data Rate of climb / descent (≥, ≤, =, highest) **shall** be shared between the Transferring, Receiving and No_Contact Res.
Status	<Validated>
Rationale	In Basic IOP, IOP Units should be able to use a Rate as coordination data.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any ROC/ROD Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0151
Title	Modification of the Rate by the Transferring RE
Requirement	The Transferring RE **shall** be able to modify the C&T Contractual data rate.
Status	<Validated>
Rationale	In Basic IOP, the systems should allow the Transferring RE to modify this C&T data.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of ROC/ROD C&T core requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0155

Title	Modification of the Rate by the Receiving RE
Requirement	The Receiving RE **shall** be able to modify the C&T Contractual data rate as per bilateral agreement.
Status	<Validated>
Rationale	Bilateral agreement should determine if downstream can modify C&T data without negotiation
Category	<Interoperability>
Implementation	Optional – It requires the implementation of ROC/ROD C&T core requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.2 C&T Unit Data

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	M	**C&T Unit data**		

IMPLEMENTATION RULE		BASIC IOP REQUIREMENTS
	M	COTR.0109-C&T Unit RE Frequency Data
Mandatory when C&T unit RE Identification is implemented	O	COTR.0186-C&T Unit RE Identification
It requires the implementation of COTR.0186	O	COTR.0190-Receiving RE identification C&T Unit Data
	M	COTR.0200-Receiving RE Frequency C&T Unit Data
It requires the implementation of COTR.0186	O	COTR.0201-Transferring RE Identification C&T Unit Data
	M	COTR.0202-Transferring RE frequency C&T Unit Data

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0109
Title	C&T Unit RE Frequency Data
Requirement	The following C&T Unit data: • Transferring frequency • Receiving frequency **Shall** be shared between the Transferring and Receiving REs.
Status	<Validated>
Rationale	Each of the two REs from different IOP Units involved in a transfer of communications must know the frequency used by its partner.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0186
Title	C&T Unit RE Identification

Requirement	The following C&T Unit data: • Transferring RE identification • Receiving RE identification **Shall** be shared between the Transferring and Receiving REs.
Status	<Validated>
Rationale	Each of the two REs from different IOP Units involved in a transfer of communication is interested to know the identification used by its partner.
Category	<IER><Interoperability>
Implementation	Optional – Mandatory when C&T unit RE Identification is implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0190
Title	Receiving RE identification C&T Unit Data
Requirement	The receiving IOP unit **shall** be able to modify the receiving RE identification C&T Unit data.
Status	<Validated>
Rationale	The modification can be performed by the system or an ATCO of the receiving unit (local implementation).
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.0186

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0200
Title	Receiving RE Frequency C&T Unit Data
Requirement	The receiving IOP unit **shall** be able to modify the receiving RE frequency C&T Unit data.
Status	<Validated>
Rationale	The modification can be performed by the system or an ATCO of the receiving unit (local implementation).
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0201
Title	Transferring RE Identification C&T Unit Data
Requirement	The transferring IOP unit **shall** be able to modify the transferring RE identification C&T Unit data.
Status	<Validated>
Rationale	The modification can be performed by the system or an ATCO of the transferring unit (local implementation).
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.0186

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0202
Title	Transferring RE frequency C&T Unit Data
Requirement	The transferring IOP unit **shall** be able to modify the transferring RE frequency C&T Unit data.
Status	<Validated>
Rationale	The modification can be performed by the system or an ATCO of the transferring unit (local implementation).
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.3 C&T Functional Data

INTEROP CHAPTERS							
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	M	**Coordination and Transfer Functional Data**	
					M	COTR.0110-Mandatory C&T Functional Data	
					M	COTR.0096-Non-standard conditions determination	

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0110
Title	Mandatory C&T Functional Data

Requirement	The following C&T Functional data: • Phase of coordination (CAP, NP) • Communication status (Frequency changed, Assumed) • Stolen information • Standard / non-standard coordination status • Request on frequency • Transfer of Control Point (TCP) **shall** be shared between The Transferring and Receiving REs.
Status	<Validated>
Rationale	Transfer conditions may rely on these items which are of an information character (flags) or requests for information.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0096
Title	Non-standard conditions determination
Requirement	Each separated C&T Contractual data **shall** be flagged as non-standard if they are assessed as not in compliance with the Letter of Agreement by either the Transferring IOP Unit or the Receiving IOP Unit.
Status	<Validated>
Rationale	Every C&T Contractual data might be flagged as Non-standard so that the 'faulty' item can be detected. This is valid before the CAP, in CAP and in NP.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.4 Manual Actions on C&T

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	M	**Manual actions on C&T**		

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	COTR.0019-Agreed change in CAP and NP
		M	COTR.0210- Verbally agreed change in CAP and NP
It requires the implementation of COTR.163		O	COTR.0162-Short time frame coordination
It requires the implementation of COTR.162		O	COTR.0163-Short time frame negotiation

In CAP, by default, any changes performed will be implemented immediately.

Additionally, in CAP, the ATCO will have the possibility to manually trigger a negotiation for the change performed.

In NP, by default, any changes performed will result in a negotiation.

Additionally, in NP, the ATCO will have the possibility to choose between

a. Previously agreed, meaning that the change is implemented immediately and is indicated as a new already agreed data for the downstream sector, e.g. by telephone, LoA or daily agreement,or
b. Force, meaning the change is implemented immediately and is indicated as new data for the downstream sector. An additional indication for the receiving ATCO might be necessary to highlight that this was unilaterally modified without its agreement.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0019
Title	Not agreed change in CAP and NP
Requirement	In the CAP and NP, the upstream RE **shall** indicate when a change of an element of C&T Contractual data or of the portion of the 2D route containing the TCP has been implemented unilaterally (without negotiation)
Status	<Validated>
Rationale	In order to distinguish on HMI changes already approved from changes not agreed due to urgency, an agreement unknown by the system (i.e. by phone) must be indicated with the change to avoid useless acknowledgment.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0210
Title	Verbally agreed change in CAP and NP
Requirement	In the CAP and NP, it **shall** be possible to indicate that a change of an element of C&T Contractual data or of the portion of the 2D route containing the TCP has been implemented after a successful verbal negotiation.
Status	<Validated>
Rationale	In order to distinguish on HMI changes already approved from changes not agreed due to urgency, an agreement unknown by the system (i.e. by phone) must be indicated with the change to avoid useless acknowledgment.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

In the IOP environment it should be possible for the downstream, not yet in control ATCO, to request an input to its upstream, in control ATCO, for immediate effect, e.g. for separation purposes. On IOP level this request would trigger a negotiation and include a flag that indicates its urgency to the receiver. The receiver of this request is expected to either reject/ignore (time-out==>reject) or to accept and immediately implement the request

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0162
Title	Short time frame coordination
Requirement	A Receiving RE requesting a modification of one of the following Contractual C&T data **shall** be able to indicate that the corresponding clearance is to be issued as soon as possible: • Direct (DCT), • Heading, • Speed.
Status	<Validated>
Rationale	When providing these coordination data to define the transfer conditions, the Receiving RE should be able to indicate that the expected clearance is to be issued as soon as practicable.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.163

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0163
Title	Short time frame negotiation
Requirement	A Receiving RE negotiating one of the following Contractual C&T data **shall** be able to indicate that it expects the corresponding clearance to be issued as soon as possible once agreed: • Direct (DCT), • Heading, • Speed.
Status	<Validated>
Rationale	A coordination proposal is sometimes helpful if executed in a limited period of time. It is useful for the ATCO to be able to emphasize this relative urgency.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of COTR.162

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.2.5 Release

REQUIREMENTS FOR INTEROPERABILITY	*INTEROP CHAPTERS*						
	M	**COORDINATION & TRANSFER**	M	**Coordination and Transfer Data**	O	**Release**	

IMPLEMENTATION RULE			*BASIC IOP REQUIREMENTS*
Mandatory when any Release Requirement is implemented	CORE	O	COTR.0129-No Release
Mandatory when any Release Requirement is implemented	CORE	O	COTR.0130-Full Release
Mandatory when any Release Requirement is implemented	CORE	O	COTR.0060-Release modification
It requires the implementation of Release core requirements		O	COTR.0164-Full Release request

The Release provided by an RE determines the degree of freedom offered by this RE to another RE in order to control the aircraft inside its AoR.

In Basic IOP, the release functionality is limited to four statuses:

- The 'No Release' status means no degree of freedom is offered and the aircraft should not deviate from the flight script. No vertical or horizontal clearance can be issued without coordination,
- The 'Full Release' status means the controlling RE can modify the flight script and issue clearances without coordination, however operationally, controllers can be bound by procedures,
- Release for Climb without or with a vertical limit (which may be a band),
- Release for Descent without or with a vertical limit (which may be a band),

The release functionality is a key element of the management of a flight in the airspace of another IOP Unit and will bring full benefits when implemented with the Skip and the Delegation functionalities.

The release status is displayed on the controller HMI in both REs. This could be graphical or textual. The information may also be input into controller tools, for example to highlight a clearance that would breach the release qualifier. The use of release information in controller tools is, however, a local implementation matter, and subject to validation.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0129
Title	No Release
Requirement	An IOP unit **shall** be able to provide a NO Release.
Status	<Validated>
Rationale	A No Release is provided when the RE providing it wants the trajectory to be fully respected.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Release Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution

<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0130
Title	Full Release
Requirement	An IOP unit **shall** be able to provide a FULL Release.
Status	<Validated>
Rationale	A Full release is provided to offer full degree of freedom to the RE controlling the aircraft. In Basic IOP, controllers can be bound by procedures.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Release Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0060
Title	Release modification
Requirement	A Transferring, Receiving or Skipped IOP Unit **shall** be able to provide and modify its Release at any point in time
Status	<Validated>
Rationale	The release conditions can be set by the Transferring, Receiving or Skipped IOP Unit automatically or manually from the beginning of the SAP until the exit of its airspace.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Release Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0167
Title	Release request overwriting
Requirement	When an IOP Unit provides a release to a coordination partner, any outstanding Release request made by that partner to this Unit **shall** be removed.
Status	<Validated>
Rationale	When a release is provided, the provider has taken into account all the pending requests and has made a decision on the appropriate release. Therefore, all prior requests can be removed.
Category	<Interoperability>
Implementation	Optional - Core (Mandatory when any Release Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0164
Title	Full Release request
Requirement	An IOP unit **shall** be able to request a FULL Release from its coordination partner.
Status	<Validated>
Rationale	In Basic IOP, the Receiving RE might need release from the Transferring RE to manage the flight after an early transfer. Even though less frequent, this is also valid for the Transferring to the Receiving in case of late transfer.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of Release core requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.3 Flight Transfer

4.3.3.3.1 Transfer of Control

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Flight Transfer**	M	**Transfer of control**		

IMPLEMENTATION RULE			BASIC IOP REQUIREMENTS
		M	COTR.0032-Transfer of communication start
		M	COTR.0034-Assumption
		M	COTR.0103-Frequency change triggering the NP

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0032
Title	Transfer of communication start
Requirement	The Transferring RE **shall** inform the Receiving RE as soon as the transfer of communication was initiated.
Status	<Validated>
Rationale	Downstream ATCO should know when the transfer of frequency occurred. In this requirement, the term "ATCO" indicates the information has to be available at the HMI level (local implementation).

Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0034
Title	Assumption
Requirement	The Receiving RE of the downstream unit **shall** inform the Transferring RE as soon as the flight is assumed
Status	<Validated>
Rationale	Upstream ATCO should know when the flight is assumed. In this requirement, the term “ATCO” indicates the information has to be available at the HMI level (local implementation).
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0103
Title	Frequency change triggering the NP
Requirement	If not already triggered, a frequency change to the Receiving Unit **shall** trigger the Negotiation Phase.
Status	<Validated>
Rationale	It is mandatory for the receiving ATCO to have full access to the flight data when the radio contact is imminent. The CAP should then be triggered but as there is no way for transferring ATCO to change anything (flight crew no longer in contact), receiving ATCO should be aware he can no longer modify a C&T data without negotiating with his upstream. Reason why, the NP is triggered.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.3.2 Force Assume

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Flight Transfer**	M	**Force-Assume**		

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	COTR.0052-Stolen information before the frequency change
		M	COTR.0053-Stolen information cancellation
		M	COTR.0054-Stolen information cancellation by second assumption
		M	COTR-0216-Force-assume by an IOP Unit in the Control Sequence
		M	COTR.0218-Retention of the C&T data upon force-assume
		M	COTR.0056-Multiple RE's stolen information
		M	COTR.0106-Stolen information after the frequency change

In IOP, assuming a flight is the technical trigger for the system to become the FDMP (Flight Data Manager Publisher) in charge of the FO update and distribution. That's the reason why, being able to assume a flight calling your frequency is a mandatory functionality in IOP.

Despite in nominal case, the assumption should follow a frequency change from previous controlling ATCO (instruction to the flight crew and action into the system), the assumption must be available in case of any failure in the transfer process (flight crew changing frequency without being instructed to do so, wrong flight selected by the upstream CWP when implementing the instruction into the system, frequency change IOP message failure…). This is the role of the force-assumption.

However, the force-assumption functionality creates a risk to disturb the nominal flow of exchanges between units and the impacts of its use for the other IOP Unit must be taken into account.

The following requirements aim at offering the functionality without forgetting tackling the consequences of its use and the way to undo the action if it was inappropriate.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0052
Title	Stolen information before the frequency change
Requirement	Before the transfer of frequency has been initiated, in case of force-assumption, the former controlling RE **shall** be notified that the flight has been stolen.
Status	<Validated>
Rationale	As the force-assumption is not a nominal case of frequency change, the former controlling RE should get special notice of it.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0053
Title	Stolen information acknowledgement
Requirement	The former controlling IOP unit **shall** be able to remove the Stolen information by either a manual or automatic acknowledgement.

Status	<Validated>
Rationale	If the former controlling IOP Unit agrees with the new situation, he should be able to inform the new controlling IOP Unit of his agreement by acknowledging and removing the stolen information. The acknowledgement can be implemented as a manual or automatic action. OPS recommend this input should trigger the CPDLC End message to the aircraft.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0054
Title	Stolen information cancellation by second assumption
Requirement	If an RE assumes a flight marked as “Stolen”, the Stolen information related to a previous force-assumption **shall** be cancelled.
Status	<Validated>
Rationale	The Stolen information should only refer to the current assumption.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0216
Title	Force-assume by an IOP Unit in the Control Sequence
Requirement	An RE of any IOP unit in the control sequence and expected to control the flight, **shall** be able to force-assume that flight.
Status	<Validated>
Rationale	An RE within the control sequence should be able to take full control of a flight when he’s contacted by the flight crew, independently of any other system configuration (frequency change status or predefined control sequence). Local rules will determine the eligibility of the local RE to perform the force assume.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0218
Title	Retention of the C&T data upon force-assume
Requirement	In case of force assume, C&T data **shall** be retained.
Status	<Validated>
Rationale	This information will be used to re-evaluate the C&T data at the time of force assume by an upstream unit. Furthermore, it is necessary to maintain a correct flight profile, hence constraints associated to C&T data must not be lost.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0056
Title	Multiple RE's stolen information
Requirement	When the flight is force-assumed by a further downstream RE, the stolen information **shall** be provided to all his upstream REs neither skipped nor No_Contact up to (and including) the former controlling RE.
Status	<Validated>
Rationale	Any ATCO expected to control a flight must be aware when a flight is already assumed by one of its downstream ATCO. It is a local SI decision whether and where the stolen information is displayed.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0106
Title	Stolen information after the frequency change
Requirement	After the transfer of frequency has been initiated, in case of force-assumption by another IOP Unit than the intended Receiving RE, the intended Receiving RE and the new controlling RE **shall** be notified that the flight has been stolen.
Status	<Validated>
Rationale	Once the frequency change occurred, the former controller ATCO no longer worries about the flight being stolen by a third party, whereas the ATCO expecting the flight to contact him needs to be notified.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.3.3 Request on Frequency (ROF)

REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Flight Transfer**	O	**ROF**		

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
Mandatory when any ROF Requirement is implemented	CORE	O	COTR.0040-Request on Frequency
Mandatory when any ROF Requirement is implemented	CORE	O	COTR.0041-ROF awareness
Mandatory when any ROF Requirement is implemented	CORE	O	COTR.0042-Request on Frequency in CAP and NP
Mandatory when any ROF Requirement is implemented	CORE	O	COTR.0043-NP triggered by ROF
Mandatory when any ROF Requirement is implemented	CORE	O	COTR.0044-ROF ended by Frequency Change

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0040
Title	Request on Frequency
Requirement	The Receiving RE or a No_Contact RE **shall** be able to request an aircraft on frequency to the Transferring RE before the actual frequency change is executed.
Status	<Validated>
Rationale	Currently used with OLDI, this functionality must remain available in IOP.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any ROF Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0041
Title	ROF awareness
Requirement	The Transferring RE **shall** be informed of a request on frequency from the Receiving RE or a No_Contact RE.
Status	<Validated>
Rationale	Currently used with OLDI, this functionality must remain available in IOP.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any ROF Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0042
Title	Request on Frequency in CAP and NP
Requirement	The ability to request on frequency **shall** be available whilst either in the CAP or NP.
Status	<Validated>
Rationale	When a Request on frequency functionality is used, both ATCOs should be aware of the flight.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any ROF Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0043
Title	NP triggered by ROF
Requirement	The Request on Frequency **shall** trigger the Negotiation Phase.
Status	<Validated>
Rationale	The meaning of the ROF is: "Transfer me this aircraft as soon as possible in the current transfer conditions", which means downstream ATCO does not want the transfer conditions to be modified without notice, which is the aim of the NP.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any ROF Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0044
Title	ROF ended by Frequency Change
Requirement	Transfer of Frequency from the Transferring RE to the Receiving RE **shall** terminate the Request on Frequency it has been addressed to.
Status	<Validated>
Rationale	Performing the frequency change (to the requester) satisfies the request of frequency, which can then be terminated.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any ROF Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.3.4 Undo Actions

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	M	**Flight Transfer**	O	**Undo actions**		

IMPLEMENTATION RULE		*BASIC IOP REQUIREMENTS*	
Mandatory when any undo-send Requirement is implemented	CORE	O	COTR.0036-Undo-send

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0036
Title	Undo-send
Requirement	The Transferring RE **shall** be able to undo the frequency change (undo-send) until the flight is assumed by the Receiving RE.
Status	<Validated>
Rationale	Transfer of frequency could be made by mistake and ATCO should then have a means to correct his error.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any undo-send Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.3.4 Point

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**COORDINATION & TRANSFER**	O	**Point**				

IMPLEMENTATION RULE		*BASIC IOP REQUIREMENTS*	
Mandatory when any Point Requirement is implemented	CORE	O	COTR.0085-Point functionality
Mandatory when any Point Requirement is implemented	CORE	O	COTR.0107-Content of a Point
Mandatory when any Point Requirement is implemented	CORE	O	COTR.0207-Flight information to support the point
Mandatory when any Point Requirement is implemented	CORE	O	COTR.0168-Content of an Unpoint
Mandatory when any Point Requirement is implemented	CORE	O	COTR.0108-Point cancellation

The Point function is an RE to RE coordination function to support a telephonic coordination.

The Point function should be available as soon as the flight is known by one of the two involved system.

The Point functionality causes the data block and/or the flight data to be highlighted to the controller and is used to unambiguously identify a flight to another RE, to support verbal coordination or agree a course of action to resolve a conflict.

The Unpoint is an optional functionality that allows the Point to be removed from another Unit's HMI.

The behaviour of HMIs after a closure of a point session is local implementation (whether a highlight is maintained or not).

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0085
Title	Point functionality
Requirement	Any RE of an IOP Unit **shall** be able to Point out a flight to an RE of another IOP Unit.
Status	<Validated>
Rationale	• The Point functionality should be available between any IOP units.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Point Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0107
Title	Content of a Point
Requirement	The initiator of the Point **shall** share with the other IOP Units: • the identity of the concerned flight, • the RE identification of the receiver of the Point, • the RE identification of the initiator of the Point.
Status	<Validated>
Rationale	Currently used with OLDI, this functionality must remain available in IOP. In case of Point from another IOP Unit than the one with whom the transfer will occur, the pointed out RE should know who is the initiator of the Point.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any Point Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0207
Title	Flight information to support the point
Requirement	Upon sending a point, up-to-date flight information corresponding to the pointed flight **shall** be shared with the receiver of the point, if it is not already shared with them.
Status	<Validated>
Rationale	In the case that the trajectory of the pointed flight does not cross the AoI of the receiver, the receiver will not already have flight information for the flight.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any Point Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0168
Title	Content of an Unpoint
Requirement	The initiator of the Unpoint **shall** share with the other IOP Units: • the identity of the concerned flight, • the RE identification of the receiver of the Unpoint, • the RE identification of the initiator of the Unpoint.
Status	<Validated>
Rationale	These information are needed to use the Unpoint as defined in requirement COTR.0108
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any Point Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0108
Title	Point cancellation
Requirement	The RE that pointed out a flight or the RE that the flight has been pointed out to **shall** be able to Unpoint that flight
Status	<Validated>

Rationale	This functionality covers the two following needs: • The Point cancellation (Point is no longer required), • The closure of the Point after the verbal coordination occurred. The use of this optional functionality should be based on bilateral agreement according to the local expectations at HMI level.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Point Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.4 What-If Flight Object

What-if flight object is a mechanism to support the negotiation of C&T contractual data between neighbouring units. It is an optional feature but, unit not supporting this feature should be able to advise a partner requesting a negotiation that is does not support this feature.

4.3.4.1 Default Behaviour

REQUIREMENTS FOR INTEROPERABILITY	M	**WHAT-IF FLIGHT OBJECT**	M	**Default Behaviour**				

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		M	COTR.0219-Answer to a negotiation by Reject
Mandatory when negotiation capability is NOT implemented		O	COTR.0220-Behaviour of unit not supporting the negotiation

By default all IOP units must implement a reject capability either because the proposal is rejected or because they don't support the negotiation mechanism.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0219
Title	Answer to a negotiation by Reject
Requirement	An IOP Unit receiving a change proposal for C&T Contractual data with negotiation **shall** be able to reject the proposal.
Status	<Validated>
Rationale	Electronic dialogues should be able to model current negotiation by phone, which can be accepted or rejected. This is also applicable to a received counter-proposal.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0220
Title	Behaviour of unit not supporting the negotiation
Requirement	An IOP Unit receiving a change proposal for C&T Contractual data with negotiation **shall** be able to reject the proposal indicating that it does not support negotiation.
Status	<Validated>
Rationale	Even if the negotiation feature is not supported, unit should respond to the request to inform the originator does not support the negotiation.
Category	<Interoperability>
Implementation	Optional – Mandatory when negotiation capability is NOT implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.4.2 Negotiation Capability

The following requirements provide a stepwise development of the negotiation tool.

4.3.4.2.1 Generic Negotiation Mechanism

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**WHAT-IF FLIGHT OBJECT**	O	**Negotiation Capability**	O	**Generic Negotiation Mechanism**		

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0087-C&T Contractual Data Negotiations eligibility
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0088-Identification of the negotiation partner
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0204-Answer to a negotiation by Accept or Reject
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0203-Negotiation cancellation
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0090-Negotiation rejection or cancellation
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0205-Counter-proposal
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0214-Negotiation results awareness
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0098-Negotiation Closure and Implementation

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0087
Title	C&T Contractual Data Negotiations eligibility
Requirement	Negotiation of C&T Contractual Data through electronic dialogues between two successive units **shall** be possible in the time frame from the beginning of the CAP until the end of the NP.
Status	<Validated>

Rationale	The negotiation phase ends once the flight is assumed by the downstream unit.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0088
Title	Identification of the negotiation partner
Requirement	The initiator of a negotiation **shall** define the IOP Unit to which the negotiation is addressed.
Status	<Validated>
Rationale	A unit may negotiate its coordination data with either the upstream or downstream partner.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0204
Title	Answer to a negotiation by Accept
Requirement	An IOP Unit receiving a change proposal for C&T Contractual data with negotiation **shall** be able to accept the proposal.
Status	<Validated>
Rationale	Electronic dialogues should be able to model current negotiation by phone, which can be accepted or rejected. This is also applicable to a received counter-proposal.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0203
Title	Negotiation cancellation
Requirement	The initiator of a change proposal for C&T Contractual Data with negotiation **shall** be able to cancel the change proposal until it has been implemented by an 'accept' input.
Status	<Validated>
Rationale	The initiator should have the possibility to cancel the change proposal whenever it becomes irrelevant.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0090
Title	Negotiation termination
Requirement	A rejection or a cancellation of a proposal or counter-proposal **shall** terminate close the negotiation process without implementing any change.
Status	<Validated>
Rationale	The negotiation stops as soon as one of the partners disagrees.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0205
Title	Counter-proposal
Requirement	An IOP Unit receiving a change proposal for C&T contractual Data with negotiation **shall** be able to modify (counter propose) the proposal.
Status	<Validated>
Rationale	Optionally, an IOP Unit might want to counter-propose when receiving a change proposal. It is also applicable to a received counter-proposal.
Category	<Interoperability>
Implementation	Optional - Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0214
Title	Negotiation results awareness
Requirement	The units involved in a negotiation **shall** be made aware of the result of this negotiation.
Status	<Validated>
Rationale	At the end of the negotiation process, the actors involved in a negotiation must be aware of the accepted modifications or of the rejection. This ‘rejection’ covers both the rejection because of a disagreement and the rejection by the FDMP in case of impossibility to implement the agreement provided by the WIMP.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0098
Title	Negotiation Closure and implementation
Requirement	The acceptance of a proposal or counter-proposal **shall** close the negotiation process and implement the agreed change.
Status	<Validated>
Rationale	An agreed proposal should be applied to the flight.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.4.2.2 Negotiable items

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**WHAT-IF FLIGHT OBJECT**	O	**Negotiation Capability**	O	**Negotiable Items**		

IMPLEMENTATION RULE			BASIC IOP REQUIREMENTS
It requires the implementation of Core Negotiation Capability Requirements		O	COTR.0176-Negotiation of TFL
It requires the implementation of Core Negotiation Capability Requirements and COTR.0176		O	COTR.0177-Negotiation of SFL
It requires the implementation of Core Negotiation Capability Requirements		O	COTR.0178-Negotiation of Direct
It requires the implementation of Core Negotiation Capability Requirements		O	COTR.0179-Negotiation of Heading
It requires the implementation of Core Negotiation Capability Requirements		O	COTR.0180-Negotiation of Speed
It requires the implementation of Core Negotiation Capability Requirements and COTR.0176		O	COTR.0181-Negotiation of Rate

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0176
Title	Negotiation of TFL
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the C&T Contractual Data “TFL”.
Status	<Validated>
Rationale	Description of the needed negotiable items.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Negotiation Capability Requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0177
Title	Negotiation of SFL
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the C&T Contractual Data “SFL”.
Status	<Validated>
Rationale	Description of the needed negotiable items.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Negotiation Capability Requirements and COTR.0176

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0178
Title	Negotiation of Direct
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the C&T Contractual Data “Direct”.
Status	<Validated>
Rationale	Description of the needed negotiable items.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Negotiation Capability Requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution

<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0179
Title	Negotiation of Heading
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the C&T Contractual Data “Heading”.
Status	<Validated>
Rationale	Description of the needed negotiable items.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Negotiation Capability Requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0180
Title	Negotiation of Speed
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the C&T Contractual Data “Speed”.
Status	<Validated>
Rationale	Description of the needed negotiable items.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Negotiation Capability Requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0181
Title	Negotiation of Rate
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the C&T Contractual Data “Rate”.
Status	<Validated>
Rationale	Description of the needed negotiable items.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Negotiation Capability Requirements and COTR.0176

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.4.2.3 Flight Object Update during Negotiation

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**WHAT-IF FLIGHT OBJECT**	O	**Negotiation Capability**	O	**Flight Object Update during Negotiation**		

IMPLEMENTATION RULE		BASIC IOP REQUIREMENTS	
Mandatory when any Negotiation capability Requirement is implemented	CORE	O	COTR.0215-Update of the negotiation

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0215
Title	Update of the negotiation
Requirement	In case of flight information update deemed significant (based on local criteria) by any RE involved in a particular negotiation, that negotiation **shall** be updated accordingly or cancelled.
Status	<Validated>
Rationale	As the FO is continuously updated, the negotiation partners must be sure they've got the same understanding of what the negotiation becomes when the context evolves (real flight). That's why it is needed to share an updated view of the negotiation in progress every time one partner considers the context changed significantly, based on his own criteria.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Negotiation capability Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.5 Flight Script Management

This section describes the operating concept for management of the FO Flight Script.

The principle of the Flight Object is that the flight script is shared so that each stakeholder interested to do so can compute its own version of the flight trajectory, taking as input the flight script as well as unshared local information. The goal of sharing this is to limit the differences in trajectory computation across the stakeholders as it is important that each of them is able to compute a correct list of crossed IOP Unit's.

Each IOP unit is responsible for constraints that impact the trajectory in its own airspace only. When a unit is FDMP, it may use information of constraints beyond its airspace in order to compute immediately a "good enough" trajectory.

4.3.5.1 Constraint Management

4.3.5.1.1 Main Constraint Features

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**Flight Script Management**	M	**Constraint Management**	O	**Main Constraint Features**		

IMPLEMENTATION RULE		BASIC IOP REQUIREMENTS	
		M	FSMG.0010-Addition of Constraints
		M	FSMG.0017-Level constraint description
		M	FSMG.0019-Speed constraint description
		M	FSMG.0060-Relevant Points associated to a constraint
		M	FSMG.0063-Not-Applied Indication on constraints
		M	FSMG.0092-Cruise level change management
		M	FSMG.0065-ECL constraint Propagation
		M	FSMG.0094-Cruise speed change management
		O	FSMG.0093-ECS Constraint Propagation
		M	FSMG.0087-Departure/Arrival Levels
		M	FSMG.0091-Stay constraint
		O	FSMG.0053-Holding constraint
		M	FSMG.0096-Stability during FO update
		O	FSMG.0086-Rate of Climb/Descent in flight scrip

The detailed explanations were given in chapter 3.3.2.3.2 regarding “constraint” concept.

RULES ON CONSTRAINTS:

The first constraints affecting the flight are expressed in the RAD (Route Availability Document - https://www.nm.eurocontrol.int/RAD/index.html) document and are reflected in the filed flight plan as a flight plan not respecting the RAD is rejected by NM. So these constraints do not need to be reflected in the Flight Object.

The filed flight plan sets the first definition of the trajectory already including constraints that were known to the airline. For instance, an RFL change may be introduced in F15 to fly below reserved airspace, however there is nothing that distinguishes an RFL change introduced to respond to a constraint from an RFL change resulting from companies policies. The Network Manager has the knowledge of constraints over the whole IOP area. These initial constraints can be used to compute a trajectory that should be sufficient to determine correctly the list of crossed IOP Unit’s. These constraints include LOA’s known by NM and any other flow management constraints. These constraints are all categorized as Strategic Constraints. The resulting 4D profile is distributed to all the crossed and informed IOP Units and where appropriate the SAP phase begins. As crossed IOP Units enter SAP status, they align the profile with their internal constraints considering high/low sector profiles, computed top of descents points, constraints not known to NM, constraints defined off-line by a single IOP Unit and unknown by the other IOP Units, etc. and provide the IOP Unit managing the flight object with all the additional constraints relevant to their airspace. This unit incorporates the constraints in the computed trajectory to the best of their ability and redistributes the updated trajectory and a list of all constraints that are being used to build it.

As the flight moves to the CAP phase additional input (in the form of new constraints) is made, as controllers update the cruising levels and fix sector and IOP Unit transfer levels. These are added to the trajectory and list of constraints and again redistributed.

Constraints can be grouped according to type and almost all have the following sub-types: strategic, planning and executive (described further in the document). Note: some types of constraints do not have all three sub-types, e.g. time does not have the idea of a strategic constraint.

For each constraint there is an accompanying set of information which enables the unit currently managing the creation of the IOP trajectory and other units building the trajectory from the list of constraints to implement the change to the profile in the way that the sender intended. The concept of "ownership" exists to provide clarity on who can ultimately change or add/remove a constraint associated with a unique identifier for each constraint, where and how the constraint is expected to start and end, how the constraint may be modified when interacting with changes to the route etc. that affect the way it may be implemented, and whether the constraint can be considered to be open or closed, i.e. impacting the trajectory or not.

Note that the constraints have to be implemented sequentially starting from the current controlling IOP Unit and working through each downstream IOP Unit one by one.

Constraints are shared within the flight object as they are required to be able to correctly build the local trajectories.

Requested cruising levels and speed/level changes, the airspace users intentions, are not retained as constraints but are used to build the first definition of the plan and translated operationally in to en-route cruising levels (ECL) and en-route cruising speeds (ECS) constraints.

CONSTRAINT CATEGORY

Constraints belong to one of four categories:

- Flight plan constraints: These constraints are derived from the original flight plan information (e.g. flight plan RFL).
- Strategic constraints, they may reflect:
  - operational procedures to manage the flow of traffic within an SI or between SIs,
  - airspace use restrictions, such as noise reduction procedures,
  - default coordination constraints as stated in operational Letter Of Agreements (LOAs) between SIs or responsibilities.
- Planning constraints reflect planner's controller input, e.g. ECL or TFLs
- Executive constraints reflect controller's orders or clearances given to the flight crew (e.g. CFL)

OPEN/CLOSED

Constraints can be considered to be either open or closed, closed constraints result in a trajectory recalculation and open constraints do not result in a recalculation but they are shared for information.

Constraints can be of either type, for example a transfer level can be a closed constraint at a lateral boundary when coordinated with an adjacent unit, whereas in a climbing situation the TFL is usually the division between the two units and the level itself has no impact on the climb to the cleared level, in this case it does not impact the trajectory and can be considered to be open.

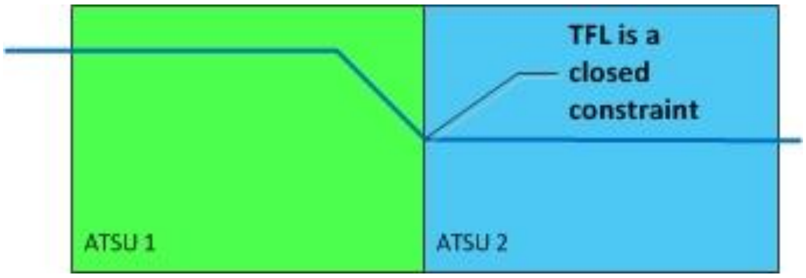


Figure 44: A closed TFL

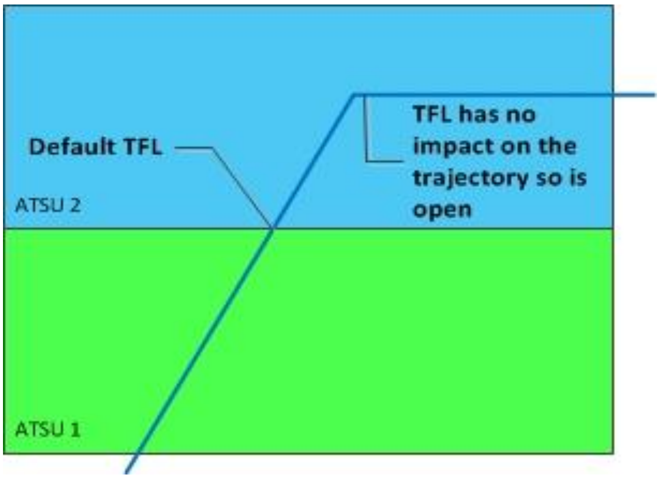


Figure 45: An open TFL

ACTIVE/INACTIVE

Strategic constraint defined in adaptation data are normally applied to all flights meeting certain conditions, e.g. all inbound flights to London Heathrow will be coordinated at the boundary between UACs at flight level 270. As this is a standard input it is automated to relieve controller workload.

However during periods of low traffic levels it may be decided that the restriction does not need to be applied. When this happens the supervisory staff can set the constraint to “inactive”. It is still present however it is not taken in to account for the trajectory calculation.

The concept of active/inactive is to assist in the management of strategic constrains built from LoAs. A constraint may be agreed between two units but only be applicable for a certain time period, e.g. only during the day. In this period the constraint is active and will be applied to all flights meeting the criteria of the constraint, e.g. all arrivals to London Heathrow. Outside of the period the constraint is inactive, although present in the Flight Script. This setting of ‘active/inactive’ may be done per flight (special allowance for curfew or military area penetration…), or more usually for time periods such as during the night or weekends. If the situations change the constraint application can be set back to its previous value (active or inactive) and will be applied accordingly to the trajectories of all flights meeting the conditions.

OWNERSHIP/ELIGIBILITY

In principle each constraint has an owner; this can be the unit that requests the constraint to be applied or for the case of a constraint due to a Letter of Agreement, one of the two parties is assigned the ownership and is responsible to apply the restriction. The constraints built from the initial flight plan do not have an owner assigned until they are modified by an IOP Unit.

Most constraints will be requested by a function in an IOP Unit to the unit controlling the flight, these requesting IOP Units are by default the owners of the constraint. When an agreed constraint exists in documents such as an LoA both agreeing parties are knowledgeable of the constraint and therefore although one or other is assigned as owner the first in the sequence may implement the request even though they are not the assigned owner.

Assigning an owner is a tool to provide a referee in case of opposite views about a constraint among different IOP Units.

Every IOP Unit is eligible to modify a constraint unless the owner blocks its rights.

CONSTRAINT TYPES

- ***LEVEL CONSTRAINTS***
    - **En-Route Cruising Level** (ECL) – the basic building block to the trajectory. Initially built from the translation of the Requested Flight Levels in the filed flight plan and may be modified by the controller for long portions of the flight.
    - **Cleared Flight Level (CFL) –** the current level clearance which has been passed and acknowledged by the pilot, the level to which the aircraft is currently manoeuvring to.
    - **Transfer Flight Level (TFL) -** this is equivalent to the Exit Flight Level (XFL) for the transferring sector and the Entry Flight Level (EFL) for the receiving sector. It is the level to which the aircraft will be cleared to prior to the transfer of communication at the boundary between sectors and centres. It may be automatically updated as the trajectory develops or can be manually set, once manually set it will not be changed automatically.
    - **Supplementary Flight Level (SFL):** A level, at or above which, or at or below which a flight has been coordinated to cross the transfer of control point. The supplementary level, if present, is an element of the exit level.
    - **Strategic level constraint** resulting from off-line-defined restrictions, e.g.:
        - Level ATC constraints for flow management
        - Default level coordination constraints

- ***SPEED CONSTRAINTS***
    - **En-route Cruise speed** – the requested speed taken from the filed flight plan.
    - **Strategic speed constraint** resulting from off-line-defined restrictions, e.g.:
        - ATC speed constraints
        - Default speed constraints from SIDs/STARs
    - **Planning speed constraint** resulting from, e.g.:
        - INAP (Integrated Network management and ATC Planner)

        - AMAN
        - ATCO planning input
    - **Executive speed constraint** derived from ATCO input, e.g.
        - Assigned speed, the current speed clearance which has been passed and acknowledged by the pilot. The assigned speed may have an additional part e.g. to be maintained at XYZ.

- *VERTICAL RATE CONSTRAINTS*
    - **Strategic vertical rate constraint** resulting from off-line-defined restrictions, e.g.:
        - ATC vertical rate constraints
        - Default vertical rate constraints from SIDs/STARs (quite often defined as Gradient constraint)
        - Default vertical rate constraints (e.g. LoAs)
    - **Planning vertical rate constraint** resulting from, e.g.:
        - INAP (Integrated Network management and ATC Planner)
        - AMAN
        - ATCO planning input
    - **Executive vertical rate constraint** derived from ATCO input.
        - Assigned Vertical rate, the current vertical rate instruction which has been passed to and acknowledged by the pilot. The assigned vertical rate may have an additional part e.g. to be maintained at XYZ
- *TIME CONSTRAINTS*
    - **Planning time constraint** resulting from, e.g.:
        - FPL STAY
        - FMP
        - INAP (Integrated Network management and ATC Planner)
        - AMAN
        - Network Manager Calculated Take of Time, and/or target times
        - ATCO planning input
    - **Executive time constraint** derived from ATCO input.
        - Controlled Time of Arrival/Controlled Time Over
        - Holding Constraints
- *LATERAL CONSTRAINTS*

Changes to the route are operationally considered to be constraints, and they result in the revised 2D path.

- **Strategic lateral constraint** resulting from off-line-defined restrictions, e.g.:
  - Constraints derived from the inclusion of SIDs and STARs
  - Automatic route replacement
  - Network management
- **Planning lateral constraint** resulting from, e.g.:
  - Planned offset manoeuvre
  - Planned diversion
  - Directs or route amendments
  - ATCO planning input
- **Executive lateral constraint** derived from ATCO input, e.g.:
  - Assigned heading, the current heading instruction which has been passed and acknowledged by the pilot.
  - Executive offset manoeuvre
  - Executive diversion
  - Directs or route amendments

TFL (Transfer Flight Level) MANAGEMENT

The levels used in coordination data are following rules defined in OLDI documents and IACO Doc 4444, as follows:

Requirements in OLDI are the following:

OLDI-FC-ESTD-30-M *The level* ***shall*** *correspond to the proposed transfer conditions, if available. For* *notification messages, it shall contain the level at which it is currently planned that the* *flight will be cleared on transfer.* ***OLDI-FC-ESTD-40-R*** *For climbing or descending flights, the estimate data* ***should*** *also contain* *supplementary crossing data and crossing condition.* ***OLDI-FC-ESTD-50-M*** *Supplementary crossing data and crossing condition* ***shall*** *be inserted only if the flight is co-ordinated to be climbing or descending.*

OLDI-FC-ESTD-60-M *If used, the supplementary crossing data* ***shall*** *contain the supplementary crossing level at the transfer of control point; the crossing condition shall be:*

Letter 'A'; if the flight will be at or above the level in the supplementary crossing

data; or

Letter 'B'; if the flight will be at or below the level in the supplementary crossing

data.

In ICAO doc, the supplementary crossing data is defined as follows:

(d) Supplementary crossing data

A LEVEL, expressed as in (c), at or above which or at or below which (see (e)) the aircraft will cross the boundary point.

(e) Crossing condition

1 LETTER as follows:

A if the aircraft will cross the boundary point at or above the level in (d),

or

B if the aircraft will cross the boundary point at or below the level in (d).

TFL is the value to which the aircraft will be cleared to prior to the transfer of communication between both units or both sectors.

TFL values can be constraining the flight in different ways depending on the geometry of the flight:

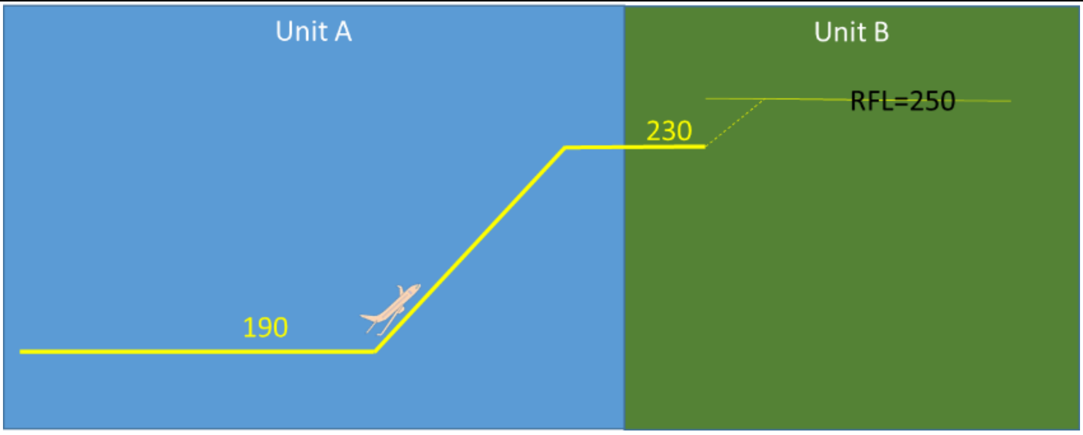


Figure 46: TFL constraint at the boundary

In the case above, the TFL =230, this value should constrain the trajectory at the boundary.

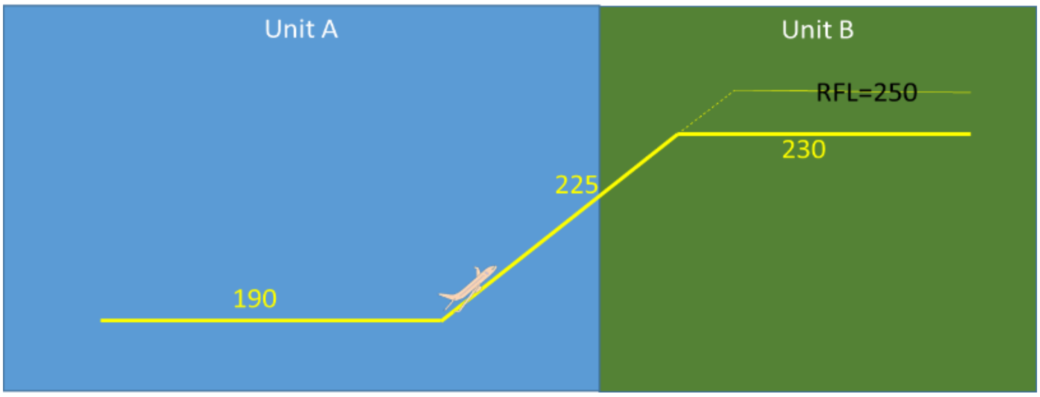


Figure 47: SFL constraint at the boundary

In the case above, we have a coordination with TFL=230 and SFL = 220, 210, 190 whatever is the level at which the aircraft is expected to be at the boundary (see ICAO definition).

The trajectory will either be constrained by the TFL in Unit B or continue the climb to the ECL if one is defined.

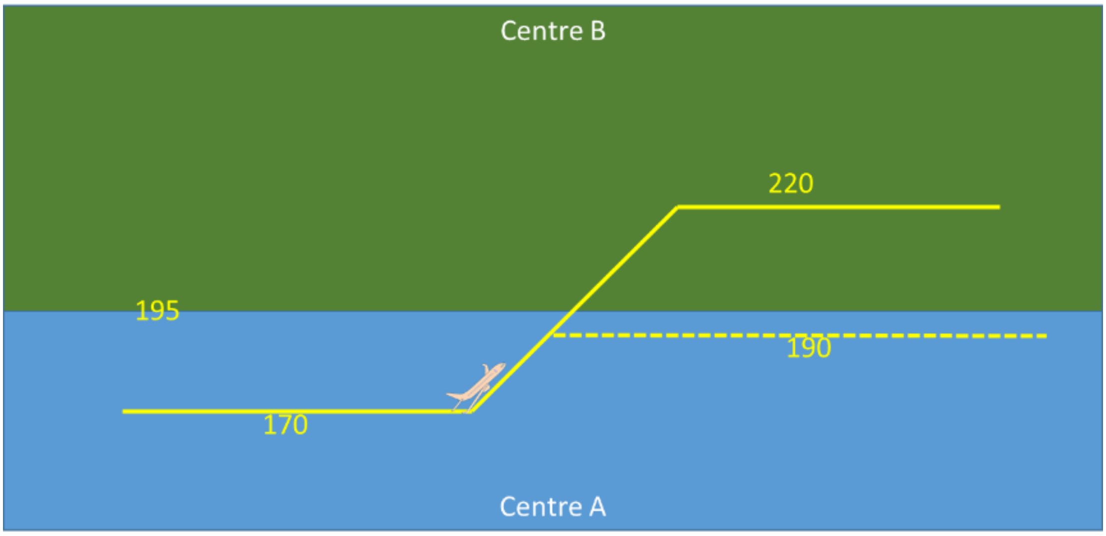


Figure 48: Constraint at the boundary without SFL

In the case above, the TFL is normally the last level in the Centre below, should be 190, and the computed trajectory should cross the F195 level because there is an ECL at 220 in the Centre B.

There is no Supplementary Flight Level in this configuration because the boundary level can only be F195.

The TFL can be set to 220 depending on the LOA between Centre A and Centre B.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0010
Title	Addition of Constraints
Requirement	An authorised IOP Unit, once in SAP, **shall** share any strategic, planning & executive constraint applicable to this flight that was not already included.
Status	<Validated>
Rationale	This includes SID, STAR, approach and missed approach procedures. In this requirement, an authorised IOP partner is: • An IOP partner whose AoR is crossed for strategic and planning constraints, • Only controlling IOP unit for executive constraints, • Expected controlling IOP unit for planning constraints.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0017
Title	Level constraint description
Requirement	When an IOP Unit shares a level constraint, it **shall** define how to be compliant with the constraint from among the following solutions: • To be strictly at the defined level, • To be at or above the defined level, • To be at or below the defined level, • To be between two levels.
Status	<Validated>
Rationale	Level constraints will include a description of how they should be implemented
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0019
Title	Speed constraint description
Requirement	When an IOP Unit shares a speed constraint, it **shall** define how to be compliant with the constraint among the following solutions: • To be strictly at the defined speed, • To be at the defined speed or greater, • To be at the defined speed or less.
Status	<Validated>
Rationale	Speed constraints will include a description of how they should be implemented.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0060
Title	Relevant Points associated to a constraint
Requirement	Shared constraint information **shall** include one of the 2 following information: • The point at which the flight start evolving • The point or segment for which the constraint is supposed to be respected
Status	<Validated>

Rationale	From a technical point of view, “relevant” means that any trajectory computation considers the point as binding unless deemed incompatible with (an)other binding constraint(s). Computed values for the non-relevant points are optional.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Some constraints are needed in the Flight Script because the IOP Units want to share these data (e.g. coordination data or clearances given to the flight crew). However, according to the phase of flight, some of these constraints might not be used to model the flight script because of assumptions on ATCOs’ behaviour. Examples of commonly agreed assumptions:

- The Transfer Flight Level between two layered IOP Units will not have an impact on the trajectory of an aircraft in the climb phase as ATCOs will anticipate the frequency change to avoid any useless level-off.
- An intermediate Cleared Flight Level issued to a climbing aircraft will most of the time be superseded by a higher level clearance before the level-off.

The IOP Unit adding the constraint will then specify his assumption, i.e. whether this constraint models the trajectory (“closed constraint”) or not (“open constraint”).

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0063
Title	Not-Applied Indication on constraints
Requirement	Constraints that are not implemented **shall** be shared with an indication that they have not been implemented in the IOP trajectory.
Status	<Validated>
Rationale	The indication will explain if the constraint was rejected or if it was unable to be implemented
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0092
Title	Cruise level change management
Requirement	When integrated in the Flight Script, every cruise level change extracted from the filed flight plan **shall** be converted into an En-Route Cruise Level (ECL) constraint, unless already modified in the local view.
Status	<Validated>
Rationale	ECLs will reflect the vertical changes requested by the user
Category	<Interoperability>

Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0065
Title	ECL constraint Propagation
Requirement	When the end point of an ECL change is not defined, the ECL change **shall** be propagated through downstream IOP Units' AoR until it meets another ECL.
Status	<Validated>
Rationale	An Upstream IOP Unit is not allowed to modify a further downstream ECL as it might impact to an unknown strong constraint not mentioned in the flight script (Airspace User's constraint, ATFCM constraint...). The IOP Unit in which airspace this next ECL stops the propagation should reassess it to possibly continue the propagation.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0094
Title	Cruise speed change management
Requirement	Every cruise speed change extracted from the filed flight Plan **shall** be converted into an En-Route Cruise Speed (ECS) constraint.
Status	<Validated>
Rationale	ECSs will reflect the speed changes requested by the user
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0093
Title	ECS Constraint Propagation

Requirement	When the end point of an ECS change is not defined, the ECS **shall** be propagated through downstream IOP Units' AoRs until the end of the cruise or until it meets another incompatible strategic, planning (except those from the flight plan) or executive speed constraint.
Status	<Validated>
Rationale	A manual ECS will overwrite any speed information derived from the flight plan until TOD Incompatible is to be understood to mean, the ECS is not coherent with the speed range of the subsequent speed constraints.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0087
Title	Departure/Arrival Levels
Requirement	Any level change or restriction defined in the SID or STAR description **shall** be integrated into the list of constraints.
Status	<Validated>
Rationale	Level constraints will be shared
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Time constraints are always planning or executive constraints (no strategic time constraint).

A time constraint can be open or closed. A TTA/TTO is open (execution phase), a CTA/CTO is open until transmitted to the pilot and acknowledged, a CTA/CTO is closed when the pilot committed to respect a CTA/CTO.

A CTOT is considered as a closed constraint.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0091
Title	Stay constraint
Requirement	An IOP Unit **shall** be able to share a stay constraint providing: • A stay identification, • A start point defined on the route, • A duration or an exit time, • And an end point defined on the route.
Status	<Validated>

Rationale	Stay constraints will include a description of how they should be implemented
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0053
Title	Holding constraint

Requirement	An IOP Unit **shall** be able to share a holding constraint providing:
	• A holding entry point defined on the expanded route,
	• And optionally:
	  ○ A holding level,
	  ○ A holding exit point
	  ○ An expected exit time
	  ○ A holding exit level

Status	<Validated>
Rationale	Holding constraints will include a description of how they should be implemented
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0096
Title	Stability during FO update
Requirement	Updates to the FO **shall** not disturb the ATCO until the information is stable
Status	<Validated>
Rationale	The operational aim is to avoid disturbing the ATCO with unstable information. To avoid intermediate updates caused by other IOP partners.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0086
Title	Rate of Climb/Descent in flight script
Requirement	When an IOP Unit shares a rate constraint, it **shall** define: • A specific assigned rate of climb or descent, or • A maximum rate of climb or descent (at or less), or • A minimum rate of climb or descent (at or greater).
Status	<Validated>
Rationale	Vertical rate constraints will include a description of how they should be implemented.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.5.1.2 Advanced Constraint

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**Flight Script Management**	M	**Constraint Management**	O	**Advanced Constraint**		

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		O	FSMG.0062-Modifying Open or Closed constraint
		O	FSMG.0070-Deactivation and reactivation of Constraints

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0062
Title	Modifying Open or Closed constraint
Requirement	An eligible IOP Unit **shall** be able to change a constraint from open to closed and vice-versa.
Status	<Validated>
Rationale	For example: Target times being closed in the planning phase and becoming open in the execution phase.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0070
Title	Deactivation and reactivation of strategic Constraints
Requirement	An eligible IOP Unit **shall** be able to set a published constraint to active/inactive per individual flight.
Status	<Validated>
Rationale	Only eligible partners can deactivate/reactivate a constraint.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.5.1.3 Clearance

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**Flight Script Management**	M	**Constraint Management**	M	**Clearance**		

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	FSMG.0034-Minimum set of shared clearance
		O	FSMG.0035-Other Shared clearances
		O	FSMG.0037-Sharing of Level Block Clearance

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0034
Title	Minimum set of shared clearance
Requirement	The following clearances **shall** be shared with the IOP Units when they are immediately applicable: • Cleared Flight Level (CFL) • DCT • Heading instruction • Specific speed instruction ([at])
Status	<Validated>
Rationale	IOP partners need to know what clearances have been given to a flight
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0035
Title	Other Shared clearances
Requirement	The following clearances **shall** be shared with the IOP Units when they are immediately applicable: • Speed instruction with the qualifier [at or less], [at or greater] • Rate of climb/descent instruction with the qualifier [at], [at or less], [at or greater] • To respect a time restriction over a fix • Holding • Stay
Status	<Validated>
Rationale	IOP partners need to know what clearances have been given to a flight.
Category	<IER><Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0037
Title	Sharing of Level Block Clearance
Requirement	In case of cleared level block, the controlling IOP Unit **shall** share the minimum and maximum levels defining the range of levels the pilot is cleared to evolve into.
Status	<Validated>
Rationale	If requested a level block can be cleared.
Category	<IER><Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.5.1.4 Coordination Constraint

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**Flight Script Management**	M	**Constraint Management**	M	**Coordination Constraint**		

IMPLEMENTATION RULE			BASIC IOP REQUIREMENTS
		M	FSMG.0104-C&T Contractual Data TFL Constraint
		M	FSMG.0114- C&T Contractual Data Speed Constraints
		M	FSMG.0115-C&T Contractual Data ROC/ROD Constraints
		M	FSMG.0116-C&T Contractual Data SFL Constraint

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0104
Title	C&T Contractual Data TFL Constraint
Requirement	It **shall** be possible to associate the TFL between adjacent IOP units to a constraint.
Status	<Validated>
Rationale	"Coordinated data" are C&T Negotiable data manually set or automatically set according to a letter of agreement. Fluctuating data (like a TFL computed by the TP in a wall boundary) depending on the trajectory and not fixed by LoA or manual input are not "Coordinated data" and would not be associated to a constraint in the flight script. If these calculated coordination data are displayed, ATCOs are able to distinguish them from the coordinated data.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0114
Title	C&T Contractual Data Speed Constraints
Requirement	The following C&T Contractual data between adjacent IOP Unit **shall** be able to be associated to a constraint: • Speed restriction (at, at or greater, at or less, minimum clean)
Status	<Validated>
Rationale	"Coordinated data" are C&T Negotiable data manually set or automatically set according to a letter of agreement. "Coordinated data" and would not be associated to a constraint in the flight script. If these calculated coordination data are displayed, ATCOs are able to distinguish them from the coordinated data.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0115
Title	C&T Contractual Data ROC/ROD Constraints

Requirement	The following C&T Contractual data between adjacent IOP Unit **shall** be able to be associated to a constraint: • Rate of climb or descent restriction (at, at or greater, at or less, expedite)
Status	<Validated>
Rationale	"Coordinated data" are C&T Negotiable data manually set or automatically set according to a letter of agreement. "Coordinated data" and would not be associated to a constraint in the flight script. If these calculated coordination data are displayed, ATCOs will be able to distinguish them from the coordinated data.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0116
Title	C&T Contractual Data SFL Constraint
Requirement	The following C&T Contractual data between adjacent IOP Unit **shall** be able to be associated to a constraint: • Supplementary flight level (SFL)
Status	<Validated>
Rationale	"Coordinated data" are C&T Negotiable data manually set or automatically set according to a letter of agreement. Fluctuating data (like a SFL computed by the TP in a wall boundary) depending on the trajectory and not fixed by LoA or manual input are not "Coordinated data" and would not be associated to a constraint in the flight script. If these calculated coordination data are displayed, ATCOs will be able to distinguish them from the coordinated data.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.5.2 Route Management

Route modification can be performed through entry of a DIRECT or a route amendment. Both entries can either start at the aircraft position or from a designated point located on the FPL route (breaking point). Both entries re-join the FPL route (Re-joining point) either on a point or the ADES.

A DIRECT is defined as a route modification where at least one point of the route is removed, without addition of a new point.

A route amendment is a route modification where, additionally to the removal of points, points or lat/longs can be added to the FPL

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**Flight Script Management**	M	**Route Management**				

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		M	FSMG.0004-Expanded Route
		M	FSMG.0005-SID/STAR
		M	FSMG.0009-Changes in the Flight Plan
		M	FSMG.0025-Flight Rule changes in the Flight Script
		M	FSMG.0026-Flight Type change in the flight script
		M	FSMG.0046-Sharing of DCT
		M	FSMG.0047-Sharing of route amendment
		M	FSMG.0048-Sharing of Route Modification
		M	COTR.0212-Route Amendment by downstream unit in his airspace
		M	COTR.0125-Flight Script modification
		M	FSMG.0066-Transfer of constraint on route amendment
		M	FSMG.0120-Sharing Flight Rule Change Information After A Route Modification
		M	FSMG.0121-Sharing Speed-Level switch Information After A Route Modification
		M	FSMG.0122-Sharing OAT-GAT Change Information After A Route Modification
		M	FSMG.0123-Sharing STAY indicator Information After A Route Modification
		O	FSMG.0105-Calculating IOP Trajectory where un-cleared portion exists
		O	FSMG.0106-Clearance of an uncleared route amendment
		M	FSMG.0049-Sharing of heading clearance
		O	FSMG.0107-Sharing of Closed vectoring clearance
		O	FSMG.0051-Sharing of an OFFSET clearance
		M	FSMG.0074-Trajectory update on diversion

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0004
Title	Expanded Route
Requirement	The creation of the 2D part of the flight script (called expanded route) **shall** be based on the filed flight plan route.
Status	<Validated>
Rationale	The filed flight plan is the basis for the route.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0005
Title	SID/STAR
Requirement	The expanded route **shall** be enriched with every published point of the SID and the STAR.
Status	<Validated>
Rationale	The shared information will encompass the departure and arrival phases.
Category	<Interoperability>

Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0009
Title	Changes in the Flight Plan
Requirement	Any change of level, speed, or flight rules/type inserted into the filed flight plan by the airspace user **shall** be integrated in the Flight Script.
Status	<Validated>
Rationale	User requirements will be shared.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0025
Title	Flight Rule changes in the Flight Script
Requirement	Any modification or addition to the planned changes from Visual Flight Rules to Instrument Flight Rules and vice-versa **shall** be shared including the information on the point where the change occurs.
Status	<Validated>
Rationale	Changes to flight rules will be shared.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0026
Title	Flight Type change in the flight script
Requirement	Any modification or addition to the planned changes from General Air Traffic to Operational Air Traffic and vice-versa **shall** be shared including the information on the point where the change occurs.
Status	<Validated>
Rationale	Changes to flight type will be shared.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution

<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0046
Title	Sharing of DCT
Requirement	An IOP Unit **shall** modify the expanded route when a direct course is entered.
Status	<Validated>
Rationale	A partner can enter a direct as a planning or executive constraint.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0047
Title	Sharing of route amendment
Requirement	An IOP Unit **shall** modify the expanded route when a route amendment is entered.
Status	<Validated>
Rationale	In this requirement, route amendment implies more complex route change than a direct. A partner can enter a change to the route as a planning or executive constraint.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0048
Title	Sharing of Route Modification
Requirement	An IOP Unit modifying the planned route of the trajectory **shall** indicate: • the point of the initial route where the deviation will start, • an end point, either on the initial route (re-join) or at another airfield in case of diversion, • the potential points defining the new route between these two points.
Status	<Validated>
Rationale	Route constraints will include a description of how they should be implemented.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0212
Title	Route Amendment by downstream unit in his airspace
Requirement	The crossed unit **shall** be able to perform a route amendment impacting the upstream or downstream centre with or without negotiation according to bilateral agreement.
Status	<Validated>
Rationale	In Basic IOP the negotiation only can be done verbally. There is no system support for electronic route negotiation.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0125
Title	Flight Script modification
Requirement	Any crossed unit **shall** be able to perform a route amendment starting and ending in his airspace without negotiation.
Status	<Validated>
Rationale	The system should be able to implement any trajectory modification as long as the impact of change is only local.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0066
Title	Transfer of constraint on route modification
Requirement	In case of route modification, the following constraints and information **shall** be reassessed and transferred to the new route according to the local rules • Level constraint, • Speed constraint, • Flight rules change (IFR/VFR), • Flight type change (OAT/GAT). • STAY Indicator.

Status	<Validated>
Rationale	Constraints need to be retained on implementation of a new route. However, in some cases the constraints can be removed (for instance STAY indicator) from the new route. The policy of how to project on the new route can be different from ATC unit to ATC Unit.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0120
Title	Sharing Flight Rule Change Information After A Route Modification
Requirement	After a route modification, it **shall** be possible to share information that a Flight Rule change indicator that was associated to a bypassed point is to happen on the surrounding segment without mentioning a precise point.
Status	<Validated>
Rationale	When a DIRECT course is issued a flight rule change may still be happening but without an exact location. Locally a system might then determine a location with or without controller input.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0121
Title	Sharing Speed-Level switch Information After A Route Modification
Requirement	After a route modification, it **shall** be possible to share information that a speed level group switch that was associated to a bypassed point is to happen on the surrounding segment without mentioning a precise point.
Status	<Validated>
Rationale	When a DIRECT course is issued a speed level change may still be happening but without prior knowledge of the exact location. Locally a system might then determine a location with or without controller input. Until that moment, any calculation may chose an arbitrary point to compute a flight profile.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0122
Title	Sharing OAT-GAT Change Information After A Route Modification
Requirement	After a route modification, it **shall** be possible to share information that an OAT GAT change that was associated to a bypassed point is to happen on the surrounding segment without mentioning a precise point.
Status	<Validated>
Rationale	When a DIRECT course is issued an OAT GAT change may still be happening but without prior knowledge of the exact location. Locally a system might then determine a location with or without controller input.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0123
Title	Sharing STAY indicator Information After A Route Modification
Requirement	After a route modification, it **shall** be possible to share information that a STAY indicator that was associated to a bypassed point is to happen on the surrounding segment without mentioning a precise point.
Status	<Validated>
Rationale	When a DIRECT course is issued a STAY indicator may still be happening but without prior knowledge of the exact location. Locally a system might then determine a location with or without controller input
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0105
Title	Sharing of uncleared route amendment
Requirement	An IOP Unit performing a route amendment **shall** indicate which segments of the route are not yet cleared to the Flight crew.
Status	<Validated>

Rationale	After a route modification which has been entered into the system but not yet cleared to the Flight crew, the outstanding route clearance must be shared
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0106
Title	Clearance of an uncleared route amendment
Requirement	An IOP Unit clearing the aircraft on an uncleared segment of the route **shall** remove the indication that this segment was uncleared.
Status	<Validated>
Rationale	After a route modification clearance which has been entered into the system, the outstanding route clearance must be updated.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0049
Title	Sharing of heading clearance
Requirement	An IOP Unit **shall** be able to share a vectoring clearance providing the following parameters: • The start point (position) on the expanded route where the heading is applicable (point of divergence), • The type of vectoring (heading or track), • The heading value or track value to fly, • The direction of the turn (to the right or to the left)
Status	<Validated>
Rationale	Heading constraints will include a description of how they should be implemented.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0107
Title	Sharing of Closed vectoring clearance
Requirement	When an IOP Unit shares a closed vectoring clearance, it **shall** indicate in the flight script: • the portion of the trajectory which is to be flown on an assigned heading (from the application point of the vectoring to the resume point) • the resume segment (from the resume point to the re-joining point).
Status	<Validated>
Rationale	The expanded route should be modified according to the closed vectoring with a clear indication not to mistake it for a route amendment.
Category	<IER><Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0051
Title	Sharing of an OFFSET clearance
Requirement	An IOP Unit **shall** be able to share an offset providing the following parameters: • The start point on the expanded route where the offset will start to be applicable (point of divergence), • The side of the offset (right or left of the trajectory), • The offset lateral distance, • Optionally, the re-join point where the offset is no longer applicable and where the aircraft re-join the nominal expanded route.
Status	<Validated>
Rationale	Offset constraints will include a description of how they should be implemented
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0074
Title	Trajectory update on diversion
Requirement	In case of diversion, an IOP Unit **shall** be able to modify the trajectory from the current position of the aircraft or from any point of the expanded route up to the new destination.

Status	<Validated>
Rationale	Partners need to be able to input a diversion
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.6 IOP Trajectory Management

4.3.6.1 Trajectory

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**IOP Trajectory Management**	M	**Trajectory**				

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	FSMG.0001-4D Trajectory
		M	FSMG.0002-IOP Trajectory Prediction

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0001
Title	4D Trajectory
Requirement	IOP Units involved in the management of a flight **shall** share the data needed to build similar 4 dimension trajectories which predicts the lateral route, the vertical position of the aircraft along the route and the time at which it will overfly each point of the route.
Status	<Validated>
Rationale	IOP Units shares a flight script containing all the constraints needed to build internal consistent trajectories.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0002
Title	IOP Trajectory Prediction
Requirement	The IOP trajectory prediction **shall** use all the lateral, vertical and longitudinal constraints that are known by the IOP Units.
Status	<Validated>
Rationale	The prediction will use all available information
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.7 IOP Unit's Sequence Management

This section describes the operating concept for control sequence handling.

DEFINITIONS

- **NO_CONTACT:** An indication that a Responsible Entity (RE) will not take the aircraft on frequency (channel). After a No_Contact input by an RE, the flight will be transferred directly to the next, downstream RE. This functionality is implemented unilaterally by the RE to avoid the aircraft is transferred on its frequency. The process of coordination between its upstream/downstream REs and the No_Contact RE remains unchanged. The No_Contact RE keeps full responsibility of the flight while its AoR is traversed. This functionality is used for flights when the No_Contact RE presumes that there is no action required. In the airspace of the No_contact RE, any clearance to be issued will be coordinated with the No_Contact RE.

- **SKIP**: An indication that an Responsible Entity (RE) will not take the aircraft under control. The flight will remain with the previous, upstream, RE or be transferred directly to the next, downstream RE. This functionality is implemented to exclude a specific RE, creating a direct coordination between its upstream and downstream REs. The upstream or downstream RE controls the flight into the skipped airspace according to the skip type (in favour of the upstream or in favour of the downstream) and in compliance with the release conditions provided by the skipped RE, if any. Any change beyond the release conditions must be coordinated with the controller of the skipped RE.

Being skipped in favour of the upstream (respectively downstream) means that the flight is controlled inside the skipped airspace by its upstream (respectively downstream) RE.

- **DELEGATE**: The ability to delegate control of a flight to a third party. This can be for the whole area of responsibility of the Responsible Entity (RE) delegating the flight or only for a part. The flight is handed over to the third party who then controls the flight in compliance with the release conditions provided by the Delegator, if any. Any change beyond the release conditions must be coordinated with the RE delegating the flight (Delegator).

Note: In this context release is understood to mean permission given by the ATCO responsible for the coordination of the flight to the ATCO controlling the flight to proceed in accordance with the limits specified in the release conditions. The controller to whom the release has been given may provide new clearances to the aircraft as long as they are within the limits of the release: vertical, lateral or longitudinal.

COMPLEMENTARY DISTRIBUTION:

- Vicinity: An IOP Unit who receives the flight object for flights which cross their AoI but not the AoR.

- General: An IOP Unit who receives the flight object for a flight due to bilaterally agreed rules.
- Subscription: An IOP Unit who requests the flight object for an identified flight. It is assumed that the FDPS of such a Unit would only have access to read the Flight Object information.
- POINT: An IOP Unit who received a flight object for a flight which has been pointed to them by another party.

CONCEPT

Each of the above actions has an impact either on the IOP Units to whom the flight object is distributed or those who will control the flight. However, it is also possible for an IOP Unit who is expected to control the aircraft to be removed from the control sequence but still be physically crossed by the flight path.

It is proposed to maintain the idea of three groups of distribution to separate the IOP Units that are going to control the flights, those that are crossed and those additional IOP Units to whom the information is distributed. The technical specifications associated to this feature will describe the creation, and management of these groups.

- The set of controlling IOP Units, i.e. those that will control the flight, it is modified by IOP Units that are SKIPed and those that are DELEGATEd.
    - All IOP Units who will control the flight need the flight information.
- The set of IOP Units that will be crossed is simply the IOP Units through which the trajectory is calculated to pass.
    - All IOP Units whose airspace will be physically crossed need to be aware of the flight.
- The complementary set of IOP Units who require the flight object, those which have been added due to the complimentary distribution.
    - All IOP Units who have requested of been presented with information should continue to receive it until the reasons to receive it are no longer valid.

The diagrams below illustrate the various groups.

SEQUENCES

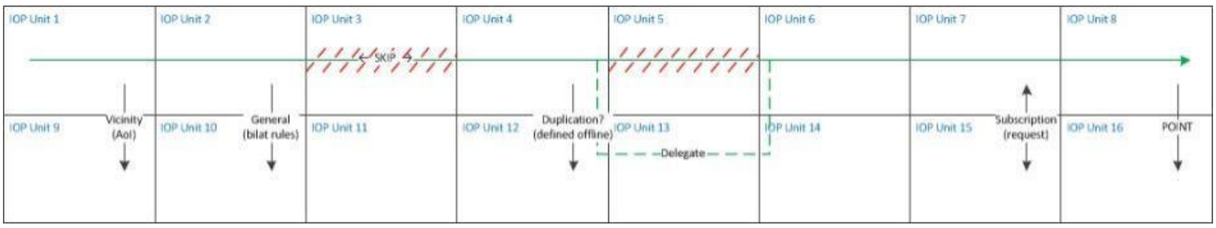


Figure 49: Sequence Modifications

The above diagram displays a flight traversing from left to right, IOP Unit1 to IOP Unit 8.

IOP Unit 3 has SKIPed themselves (up or downstream).

IOP Unit 5 has delegated the control of the flight to IOP Unit13.

Other IOP Units have made use of the Complementary distribution:

- IOP Unit 9 receives the flight information as the flight crosses it's AoI (not show on the diagram)
- IOP Unit 10 and 12 receive the flight information due to bilaterally agreed rules
- IOP Unit 15 has requested the flight information for a flight.
- IOP Unit 8 has POINTed a flight to IOP Unit16.

The diagrams below show the impact on the various groups of IOP Units.

DISTRIBUTION IOP UNITS:

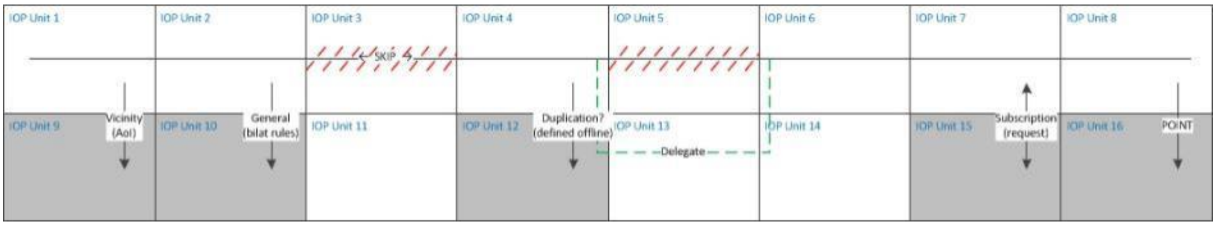


Figure 50: Distribution IOP Units

IOP Units 9, 10, 12, 15 and 16 are provided with the flight information due to the Complementary Distribution. *Note: that each entry only needs to occur once.*

CROSSED IOP UNITS

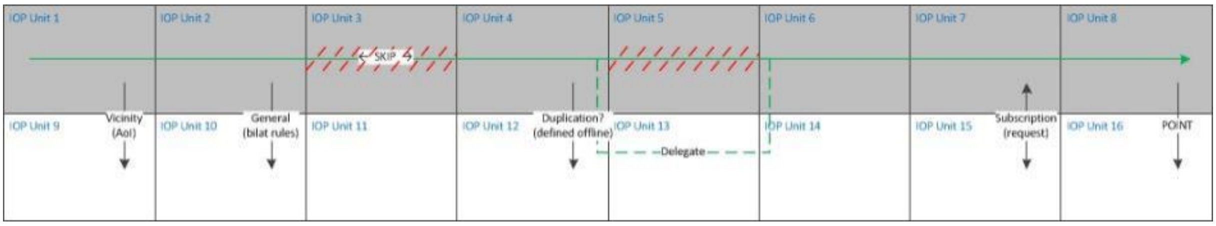


Figure 51: Crossed IOP Units

IOP Units 1 to 8 are physically crossed by the trajectory.

IOP Unit 3 will be flagged as SKIPed and IOP Unit 5 as Delegator.

Note: that there can be multiple entries due to re-entrant flights.

CONTROLLING IOP UNITS:

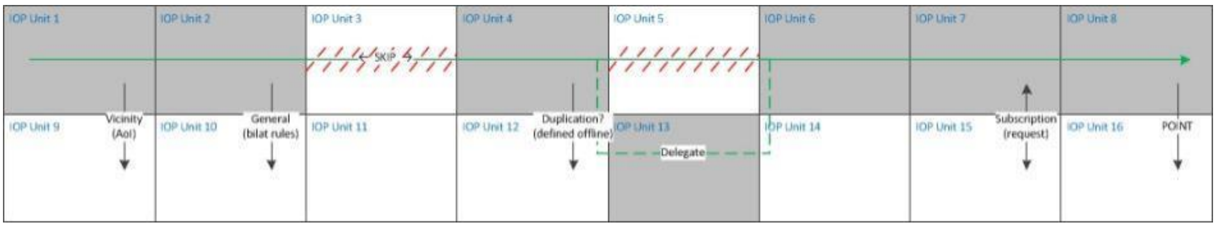


Figure 52: Controlling IOP Units

The sequence of control will be 1, 2 4, 13, 6, 7, 8. IOP Unit3 is SKIPed and IOP Unit 5 has delegated to 13.

Should the DELEGATE from IOP Unit 5 to IOP Unit 13 be a partial delegation the order of the control sequence would become 1, 2, 4, **5, 13, 5**, 6, etc. The other lists would remain unchanged.

Note: that there can be multiple entries due to re-entrant flights.

FDMP/C/U VIEW

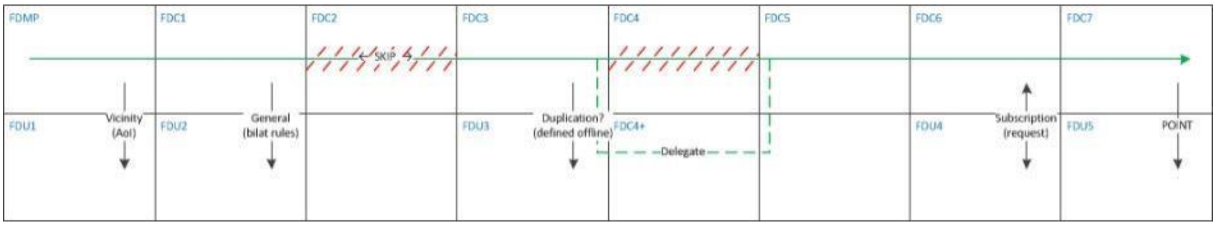


Figure 53: FDMP/C/U View

This diagram is provided to show the distribution across the FDCs and the creation of the FDUs.

4.3.7.1 Delegation

INTEROP CHAPTERS									
REQUIREMENTS FOR INTEROPERABILITY	O	**IOP Unit's Squence Management**	O	**Delegation**					

IMPLEMENTATION RULE			*BASIC IOP REQUIREMENTS*
Mandatory when any Delegation Requirement is implemented	CORE	O	COTR.0147-Delegator information in C&T data
It requires the implementation of Core Delegation Requirements and SEQM.0069 SEQM.0084		O	COTR.0188-Release information sharing during delegation
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0004-Delegation proposal by Delegator
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0030-Delegation proposal by the Delegatee
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0005-Cancellation by Delegator before frequency change
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0064-Cancellation by Delegatee before frequency change
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0078-Control sequence modification after a delegation cancellation
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0067-Mandatory information to implement a delegation
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0082-C&T Data in a Delegation proposal
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0068-Delegatee inclusion in the control sequence
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0083-Copy of the C&T Contractual Data in a Delegation
It requires the implementation of Core Delegation Requirements and COTR.0188 SEQM.0084		O	SEQM.0069-Delegation release definition
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0070-Modifications from the delegator
It requires the implementation of Core Delegation Requirements and SEQM.0071		O	SEQM.0039-Negotiation with Delegator
It requires the implementation of Core Delegation Requirements and SEQM.0039		O	SEQM.0071-Negotiation with Delegatee
Mandatory when any Delegation Requirement is implemented	CORE	O	SEQM.0076-Request of a delegation termination
It requires the implementation of Core Delegation Requirements and COTR.0188 SEQM.0069		O	SEQM.0084-Delegator Release

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0147
Title	Delegator information in C&T data

Requirement	The following C&T Unit data **shall** be shared between The Transferring and Receiving REs:
	• In case the Transferring and/or Receiving RE is a Delegatee:
	    ○ The Delegator RE Identification,
	    ○ The Delegator frequency

Status	<Validated>
Rationale	When a delegation involves either the Transferring or the Receiving RE, some additional information may offer supplementary capabilities of coordination.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0188
Title	Release information sharing during delegation
Requirement	The Release provided by the Delegator to the Delegatee **shall** be shared between The Transferring and Receiving REs
Status	<Validated>
Rationale	The release granted by the delegator RE should be known.
Category	<IER><Interoperability>
Implementation	Optional - It requires the implementation of Core Delegation Requirements and SEQM.0069 SEQM.0084

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0004
Title	Delegation proposal by Delegator
Requirement	A crossed IOP Unit **shall** be able to propose to delegate a portion of a flight to a non-crossed IOP Unit, for the whole crossing in their area.
Status	<Validated>
Rationale	An IOP Unit planned to control the flight can indicate a third party to whom the flight will be transferred for a portion of the flight (for their whole area)
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0030
Title	Delegation proposal by the Delegatee
Requirement	A non-crossed IOP Unit **shall** be able to propose to a crossed IOP Unit to control the flight in the crossed IOP Unit's airspace.
Status	<Validated>
Rationale	A user can suggest a delegation and once agreed it will be implemented. This requirement is not limited to adjacent RE/IOP Units.
Category	< Interoperability>

Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0005
Title	Cancellation by Delegator before frequency change
Requirement	The Delegator **shall** be able to cancel a delegation before the frequency change is instructed to the aircraft to contact the Delegatee.
Status	<Validated>
Rationale	The Delegator needs to be able to cancel the delegation when the conditions are no longer appropriate.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0064
Title	Cancellation by Delegatee before frequency change
Requirement	The Delegatee **shall** be able to cancel a delegation before the frequency change occurs to the Delegatee.
Status	<Validated>
Rationale	The Delegatee needs to be able to cancel the delegation.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0078
Title	Control sequence modification after a delegation cancellation
Requirement	When a delegation is cancelled, the Delegatee IOP Unit **shall** be removed from the control sequence.
Status	<Validated>
Rationale	As he won't control the flight, the Delegatee of a cancelled delegation should no longer be in the control sequence.
Category	<Interoperability>

Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0067
Title	Mandatory information to implement a delegation
Requirement	When a delegation is proposed or implemented between two IOP Units, the upstream and the downstream IOP Units of the Delegatee **shall** be approved by the Delegator or by a Letter of Agreement.
Status	<Validated>
Rationale	By default, the Delegator determines the start point and the end point of the delegation. Doing so, he will define the downstream and the upstream IOP Unit of the Delegatee in the control sequence. If the Delegation is implemented before the SAP of the Delegator, this should be defined in a LoA.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0082
Title	C&T Data in a Delegation proposal
Requirement	A Delegation proposal **shall** include the C&T data between the Delegatee and its upstream and downstream partners as part of the negotiation data.
Status	<Validated>
Rationale	The answer to the delegation proposal might depend on the C&T data expected to be used between the Delegatee Unit and its upstream and downstream partners.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0068
Title	Delegatee inclusion in the control sequence
Requirement	When a delegation is implemented, the Delegatee IOP Unit **shall** be inserted in the control sequence between its upstream and downstream IOP Units approved by the Delegator.
Status	<Validated>
Rationale	As there will be transfers of frequency between the Delegatee and its up/downstream, C&T data are needed. Approval can be by electronic negotiation, verbal negotiation, or Letter of Agreement.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0083
Title	Copy of the C&T Contractual Data in a Delegation
Requirement	When the Delegator delegates his whole airspace, the Delegatee **shall** inherit the C&T Contractual data from the Delegator.
Status	<Validated>
Rationale	As the delegation implementation does not modify the flight script, the C&T Contractual data defined before the delegation implementation should be maintained.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0069
Title	Delegation release definition
Requirement	When a delegation is implemented, the Release from the Delegator to the Delegatee **shall** be provided by the Delegator or by a Letter of Agreement.
Status	<Validated>
Rationale	By default, the delegation releases should be defined by the Delegator. This definition could however be anticipated in a LoA in order to facilitate an automatic implementation of the delegation.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Delegation Requirements and COTR.0188 SEQM.0084

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0070
Title	Modifications from the delegator
Requirement	The Delegator **shall** be able to modify : • the upstream IOP Unit of the Delegatee, by either the Delegator itself or the upstream of the Delegator, • the downstream IOP Unit of the Delegatee, by either the Delegator itself or the downstream of the Delegator, • the releases provided to the Delegatee
Status	<Validated>
Rationale	As the Delegator is the one allowed to define the Delegatee's downstream, upstream and the delegation releases, he might be able to modify his choice.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0039
Title	Negotiation with Delegator
Requirement	The Delegator **shall** be able to initiate or take part in a negotiation related to the delegated flight.
Status	<Validated>
Rationale	Despite it delegated the flight to another IOP Unit, the Delegator might want to suggest a trajectory modification to the Delegatee or might need to answer to a proposal from the Delegatee.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Delegation Requirements and SEQM.0071

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0071
Title	Negotiation with Delegatee
Requirement	The Delegatee **shall** be able to initiate or take part in a negotiation related to the delegated flight.

Status	<Validated>
Rationale	As the Delegatee is controlling the flight, he might have to negotiate a change with any other concerned partner.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Delegation Requirements and SEQM.0039

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0076
Title	Request of a delegation termination
Requirement	During a delegation, either the Delegator or the Delegatee **shall** be able to terminate the delegation.
Status	<Validated>
Rationale	An active delegation termination can be requested by either the Delegator or the Delegatee.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Delegation Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0084
Title	Delegator Release
Requirement	A Delegator **shall** be able to set and modify its releases at any point in time until the aircraft leaves its airspace the delegation is terminated.
Status	<Validated>
Rationale	The release conditions can be set by a Delegator automatically or manually from the Delegation implementation until the delegation is terminated or until the aircraft leaves its airspace.
Category	<Interoperability>
Implementation	Optional - It requires the implementation of Core Delegation Requirements and COTR.0188 SEQM.0069

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.7.2 SKIP

4.3.7.2.1 SKIP capability

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	O	IOP Unit's Squence Management	O	SKIP	O	SKIP Capability		

IMPLEMENTATION RULE			BASIC IOP REQUIREMENTS
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0001-SKIP
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0021-Downstream RE is proposed to be SKIPed
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0044-Upstream RE is proposed to be SKIPed
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0018-Manual SKIP negotiation
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0052-Manual /automatic SKIP indication
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0094-Automatic SKIP implementation
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0095-Verbally agreed SKIP
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0105-Skipped RE upstream the receiving RE

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0001
Title	IOP Unit SKIP
Requirement	It **shall** be possible for an IOP Unit in control sequence to be SKIP'ed.
Status	<Validated>
Rationale	A SKIP'ed user indicates that the IOP Unit will not take the aircraft on the frequency (channel).
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0021
Title	Downstream IOP Unit SKIP
Requirement	Both the Transferring RE and the Receiving RE **shall** be able to implement a SKIP whereby the Receiving IOP Unit to be skipped in favour of the upstream.
Status	<Validated>
Rationale	This covers the following requests: T.RE proposes skipping downstream IOP Unit and T.RE to manage the flight R.RE proposes skipping itself and T.RE to manage the flight
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0044
Title	Upstream IOP Unit is proposed to be SKIPed
Requirement	Both the Transferring RE and the Receiving RE **shall** be able to propose the Transferring IOP Unit to be skipped in favour of the downstream.
Status	<Validated>
Rationale	This covers the following requests: T.RE proposes skipping upstream IOP Unit and R.RE to manage the flight R.RE proposes skipping upstream IOP Unit and R.RE to manage the flight
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0018
Title	IOP Unit Manual SKIP negotiation
Requirement	An IOP Unit **shall** be able to implement an IOP Unit Skip.
Status	<Validated>
Rationale	When it involves two different IOP Units, the SKIP must be approved by both parties before being implemented, unless foreseen in a Letter of Agreement or verbally agreed (see REQ-18-02b-SPRINTEROP-SEQM.0095).
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0052
Title	Manual /automatic SKIP indication
Requirement	The implementation of a SKIP **shall** indicate a manual or automatic input.
Status	<Validated>
Rationale	The SKIP might be displayed differently on the CWP when manually or automatically triggered.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

The following requirements mention "*external skip*". It has to be understood as a skip of an RE in favour of an RE which belongs to another IOP Unit (the flight will be managed in the skipped RE's airspace by an RE of another IOP Unit). This covers both:

- one or more skipped RE(s) among several of a partially skipped IOP Unit, and
- all crossed RE(s) of a fully skipped IOP Unit.

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0094
Title	Automatic IOP Unit SKIP implementation
Requirement	An IOP Unit **shall** be able to automatically implement an IOP Unit SKIP.
Status	<Validated>
Rationale	In order to have a relevant control sequence, the SKIP might be implemented based on a Letter of Agreement, e.g. before every concerned IOP Unit is in SAP.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0095
Title	Verbally agreed SKIP
Requirement	An IOP Unit **shall** be able to implement an IOP Unit Skip by indicating that the Skip proposal was verbally agreed.
Status	<Validated>
Rationale	The implementation of an external Skip must be agreed by both parties as another IOP Unit takes the control responsibility. The agreement can be defined in a letter of agreement (SEQM.0094) thanks to an electronic dialogue (SEQM.0018) or here, by phone. This is useful when conditions are not compliant with the ones defined in a Letter of Agreement.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0105

Title	Skipped REs upstream of the Receiving RE
Requirement	A skipped IOP Unit **shall** indicate every skipped RE of its unit.
Status	<Validated>
Rationale	The Transferring RE must be aware of any skipped RE between him and the Receiving RE.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.7.2.2 UNSKIP Capability

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	O	**IOP Unit's Squence Management**	O	**SKIP**	O	**UNSKIP Capability**		

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0002-unSKIP of a flight in upstream RE
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0048-Transfer to a skipped RE
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0050-Force-Assume by a skipped RE
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0080-Unskip by the Unit expected to control
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0100- unSKIP of a flight in downstream RE
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0081-C&T data update in case of unskip
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0106-Delete release conditions after unskip

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0002
Title	IOP Unit unSKIP of a flight in upstream RE
Requirement	It **shall** be possible for a skipped IOP Unit to unSKIP itself while the flight is under control of any upstream RE.
Status	<Validated>
Rationale	A SKIPed IOP Unitis able to revert itself to the unSKIPed state. All data related to the UNSKIP (eg RELASE conditions) are then removed
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0048
Title	Transfer to a RE belonging to a skipped IOP Unit
Requirement	If a change of frequency input is made to a RE belonging to a skipped IOP Unit, the SKIP **shall** be undone.

Status	<Validated>
Rationale	The controlling ATCO must be able to cancel the SKIP of an RE by transferring the flight to the skipped RE.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0050
Title	Force-Assume by a skipped RE
Requirement	If a RE belonging to a skipped IOP Unit force-assumes the flight the SKIP **shall** be undone
Status	<Validated>
Rationale	If the flight is assumed by a skipped RE, the SKIP must be undone.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0080
Title	Unskip by the Unit expected to control
Requirement	The IOP Unit expected to control the flight on behalf of another IOP Unit **shall** be able to UNSKIP the skipped IOP Unit.
Status	<Validated>
Rationale	When the traffic conditions have changed since the SKIP implementation, the IOP Unit expected to control the flight might decide that the additional workload associated with the SKIP is no longer appropriate.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0100
Title	IOP Unit unSKIP of a flight in downstream RE

Requirement	It **shall** be possible for a skipped IOP Unit to unSKIP itself while the flight is under control of any downstream RE.
Status	<Validated>
Rationale	A SKIPed IOP Unitis able to revert itself to the unSKIPed state. The unSKIP function must remain after the frequency change to next IOP Unit (e.g. in order to be able to perform a Reclaim). All data related to the UNSKIP (eg RELASE conditions) are then removed
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0081
Title	C&T data update in case of unskip
Requirement	In case of UNSKIP of an IOP Unit the control sequence **shall** be updated and C&T data re-evaluated, taking into account current aircraft position in relation to boundary.
Status	<Validated>
Rationale	This applies only to the case of an RE skipped in favour of the upstream. In case of UNSKIP where the boundary is already overflown the original C&T contractual data at the boundary might be obsolete, e.g. when the flight is in climb/descend.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0106
Title	Delete Release Conditions after UNSKIP
Requirement	Release conditions tied to skipped RE's **shall** be deleted upon an UNSKIP.
Status	<Validated>
Rationale	The given release conditions will not apply anymore and should therefore be deleted.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.7.2.3 Behaviour during SKIP

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	O	**IOP Unit's Squence Management**	O	**SKIP**	O	**Behaviour during SKIP**		

Mandatory when any SKIP Requirement is implemented	CORE	O	COTR.0146-Interfering skipped REs
Mandatory when any SKIP Requirement is implemented	CORE	O	COTR.0187- Sharing of Release information by skipped RE
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0022-Retention of Coordination Data upon SKIP
It requires the implementation of Core SKIP Requirements		O	SEQM.0118-Retention of Constraints upon SKIP
Mandatory when any SKIP Requirement is implemented	CORE	O	SEQM.0098-Default release upon SKIP

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0146
Title	Skipped RE information
Requirement	For any skipped RE between the Transferring and the Receiving REs the following C&T unit data **shall** be shared ○ SkippedRE identification ○ Skipped RE frequency
Status	<Validated>
Rationale	There must be a way to inform both Transferring & Receiving REs when there is one or several skipped RE(s) between them.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0187
Title	Sharing of Release information by skipped RE
Requirement	The release provided by the skipped RE **shall** be shared between the Transferring and Receiving REs:
Status	<Validated>
Rationale	The release granted by the skipped RE should be known.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0022
Title	Retention of Coordination Data upon SKIP
Requirement	When an IOP unit is skipped, the information attached to the coordination between this unit and its partners **shall** be maintained.
Status	<Validated>
Rationale	This information will be used to re-evaluate the C&T data at the time of UNSKIP.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0118
Title	Retention of Constraints upon SKIP
Requirement	When an IOP unit is skipped, the constraints contained in the skipped IOP Unit Airspace **shall** remain in the Flight object.
Status	<Validated>
Rationale	It is necessary to maintain a correct flight profile after the skip.
Category	<Interoperability>
Implementation	Optional – It requires the implementation of Core SKIP Requirements

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0098
Title	Default release upon IOP Unit SKIP
Requirement	When an IOP Unit is skipped, a default release covering the levels between entry and exit transfer flight levels **shall** be provided
Status	<Validated>
Rationale	The IOP Unit controlling the flight in the skipped airspace must be allowed to provide the clearances expected to be given in this airspace. The release allows the skipped IOP unit to maintain separation against the skipped flight
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any SKIP Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.7.3 No_Contact

4.3.7.3.1 No_Contact and cancel no_contact capabilities

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	O	IOP Unit's Squence Management	O	No Contact	O	No Contact and cancel no contact capabilities		

IMPLEMENTATION RULE			BASIC IOP REQUIREMENTS
Mandatory when any No_Contact Requirement is implemented	CORE	O	SEQM.0089-No_Contact RE
Mandatory when any No_Contact Requirement is implemented	CORE	O	SEQM.0090-No_Contact cancellation
Mandatory when any No_Contact Requirement is implemented	CORE	O	SEQM.0091-Transfer to a No_Contact RE
Mandatory when any No_Contact Requirement is implemented	CORE	O	SEQM.0092-Force-Assume by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented and COTR.0040	CORE	O	SEQM.0102- ROF by a No_Contact RE

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0089
Title	No_Contact RE
Requirement	It **shall** be possible for an RE planned to control the flight to become a No_Contact RE.
Status	<Validated>
Rationale	A No_Contact RE indicates that it will not take the aircraft on the frequency (channel) but remains responsible for the coordinations of its upstream and downstream boundaries.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0090
Title	No_Contact cancellation
Requirement	It **shall** be possible for a No_Contact RE to undo the No_Contact unless the transferring RE has already triggered the change of frequency or the receiving has already assumed the flight.
Status	<Validated>
Rationale	A No_Contact RE is able to revert itself to the nominal state. This function must remain after the frequency change to next IOP Unit (e.g. in order to be able to perform a Reclaim).
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0091
Title	Transfer to a No_Contact RE
Requirement	If a change of frequency input is made to a No_Contact RE, the No_Contact **shall** be cancelled/terminated.
Status	<Validated>
Rationale	The controlling ATCO must be able to cancel the No_Contact of an RE by transferring the flight to this RE. If the flight didn't enter the No_Contact airspace, it could be considered as a cancellation. Otherwise, it could be considered as a termination.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0092
Title	Force-Assume by a No_Contact RE
Requirement	If a No_Contact RE force-assumes the flight the No_Contact **shall** be cancelled/terminated.
Status	<Validated>
Rationale	If the flight is force-assumed by a No_Contact RE, the No_Contact must be undone. If the flight didn't enter the No_Contact airspace, it could be considered as a cancellation. Otherwise, it could be considered as a termination.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0102
Title	ROF by a No_Contact RE
Requirement	If a Request on frequency input is made by a No_Contact RE, the No_Contact **shall** be cancelled/terminated.
Status	<Validated>
Rationale	The No_Contact RE must be able to cancel the No_Contact by performing a Request on Frequency.
Category	<Interoperability>

Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented) and COTR.0040

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.7.3.2 Behaviour during a No_Contact

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	O	**IOP Unit's Squence Management**	O	**No Contact**	O	**Behaviour during a No contact**		

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
Mandatory when any No_Contact Requirement is implemented	CORE	O	COTR.0119-Force-NP by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented	CORE	O	COTR.0120-Non-standard conditions for a No_Contact Unit
Mandatory when any No_Contact Requirement is implemented	CORE	O	COTR.0121-Modification of the TFL by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented	CORE	O	COTR.0132-C&T Functional Data for No_Contact
Mandatory when any No_Contact Requirement is implemented	CORE	O	COTR.0135-Frequency change triggering the NP over a No_Contact
Mandatory when any No_Contact Requirement is implemented and SFL C&T Requirements implemented	CORE	O	COTR.0157-Modification of SFL by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented and Direct C&T Requirements implemented	CORE	O	COTR.0172-Modification of Direct by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented and Heading C&T Requirements implemented	CORE	O	COTR.0173-Modification of Heading by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented and speed C&T Requirements implemented	CORE	O	COTR.0174-Modification of Speed by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented and ROC/ROD C&T Requirements implemented	CORE	O	COTR.0175-Modification of Rate by a No_Contact RE
Mandatory when any No_Contact Requirement is implemented and COTR.0014	CORE	O	COTR.0122-Force-CAP for downstream by No_Contact
Mandatory when any No_Contact Requirement is implemented and COTR.0013	CORE	O	COTR.0169-Force-CAP for upstream by No_Contact
Mandatory when any No_Contact Requirement is implemented	CORE	O	COTR.0170-Interfering No_Contact REs

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0119
Title	Force-NP by a No_Contact RE
Requirement	A No_Contact Unit **shall** be able to trigger the Negotiation Phase for its upstream and downstream boundary.
Status	<Validated>
Rationale	A No_Contact RE may want to prevent the Transferring or Receiving RE to require (without negotiation) an unexpected change in his airspace which would jeopardize his current strategy.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0120
Title	Non-standard conditions for a No_Contact Unit

Requirement	When a C&T Contractual data of its upstream or downstream boundary is assessed as not in compliance with the Letter of Agreement, a No_Contact IOP Unit **shall** flag this item as non-standard.
Status	<Validated>
Rationale	A No_Contact IOP Unit remains responsible for the coordinations with its upstream and downstream. The non-standard transfer conditions should be indicated as soon as considered as non-standard. Every C&T Negotiable data might be flagged as Non-standard so that the 'faulty' item can be detected. This is valid before the CAP, in CAP and in NP.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0121
Title	Modification of the TFL by a No_Contact RE
Requirement	The No_Contact RE **shall** be able to modify the TFL as C&T data of its upstream and downstream coordination boundaries.
Status	<Validated>
Rationale	In Basic IOP, the systems should allow the No_Contact RE to modify the TFL of its upstream and downstream boundaries.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0132
Title	C&T Functional Data for No_Contact

Requirement	The following C&T data **shall** be shared with a No_Contact RE contiguous to another IOP Unit:
	• Phase of coordination (CAP, NP)
	• Communication status (Frequency changed, Assumed)
	• Standard / non-standard coordination status
	• Optionally: a transfer of control point (TCP)
	• If there is any other RE between the Transferring and the No_Contact RE:
	  ○ Its RE identification
	  ○ Its frequency
	  ○ In case of skip:
	    ▪ The identification of the RE granted by the skipped RE
	• If there is any other RE between the Receiving and the No_Contact RE:
	  ○ Its RE identification
	  ○ Its frequency
	  ○ In case of skip:
	    ▪ The identification of the RE granted by the skipped RE
	• In case the Transferring and/or Receiving RE is a Delegatee:
	  ○ The Delegator RE Identification,
	  ○ The Delegator frequency,
	  ○ .

Status	<Validated>
Rationale	As the No_Contact RE is still responsible for the entry and exit conditions, it must be aware of these items which are of an information character (flags) or requests for information.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0135
Title	Frequency change triggering the NP over a No_Contact
Requirement	A frequency change between a Transferring and a Receiving RE with a No-Contact RE in between them **shall** trigger the NP for both No-Contact boundaries.
Status	<Validated>
Rationale	In the regular frequency change, the NP is triggered. With this requirement, it is assured that the NP is triggered in a No_Contact situation accordingly.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0157
Title	Modification of SFL by a No_Contact RE
Requirement	The No_Contact RE **shall** be able to modify the C&T data “SFL” of its upstream and downstream coordination boundaries
Status	<Validated>
Rationale	Optionally, the systems should allow the No_Contact RE to modify this data.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented and SFL C&T Requirements implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0172
Title	Modification of Direct by a No_Contact RE
Requirement	The No_Contact RE **shall** be able to modify the C&T data “Direct” of its upstream and downstream coordination boundaries
Status	<Validated>
Rationale	Optionally, the systems should allow the No_Contact RE to modify this data.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented and Direct C&T Requirements implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0173
Title	Modification of Heading by a No_Contact RE
Requirement	The No_Contact RE **shall** be able to modify the C&T data “Heading” of its upstream and downstream coordination boundaries.
Status	<Validated>
Rationale	Optionally, the systems should allow the No_Contact RE to modify this data.

Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented and Heading C&T Requirements implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0174
Title	Modification of Speed by a No_Contact RE
Requirement	The No_Contact RE **shall** be able to modify the C&T data "Speed" of its upstream and downstream coordination boundaries.
Status	<Validated>
Rationale	Optionally, the systems should allow the No_Contact RE to modify this data.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented and speed C&T Requirements implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0175
Title	Modification of Rate by a No_Contact RE
Requirement	The No_Contact RE **shall** be able to modify the C&T data "Rate" of its upstream and downstream coordination boundaries.
Status	<Validated>
Rationale	Optionally, the systems should allow the No_Contact RE to modify this data.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented and ROC/ROD C&T Requirements implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0122
Title	Force-CAP for downstream by No_Contact

Requirement	Unless already in NP, a No_Contact IOP Unit **shall** be able to trigger the CAP for its downstream boundary.
Status	<Validated>
Rationale	As the No_Contact RE is responsible for the coordinations, it must be able to trigger the CAP as any RE expected to control the flight in order to ease coordinations.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented and COTR.0014)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0169
Title	Force-CAP for upstream by No_Contact
Requirement	Unless already in NP, a No_Contact IOP Unit **shall** be able to trigger the CAP for its upstream boundary.
Status	<Validated>
Rationale	As the No_Contact RE is responsible for the coordinations, it must be able to trigger the CAP as any RE expected to control the flight in order to ease coordinations.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented and COTR.0013)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0170
Title	Interfering No_Contact REs

Requirement	The following C&T Unitdata **shall** be shared between The Transferring and Receiving REs:
	• For any RE between the Transferring and the Receiving REs that is No_Contact:
	    ○ Its RE identification
	    ○ Its frequency

Status	<Validated>
Rationale	There must be a way to inform both Transferring & Receiving REs when there is one or several No_Contact RE(s) between them.
Category	<IER><Interoperability>
Implementation	Optional – Core (Mandatory when any No_Contact Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.7.4 Short-cross

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	O	**IOP Unit's Squence Management**	O	**Short-Cross**				

IMPLEMENTATION RULE		BASIC IOP REQUIREMENTS	
Mandatory when any Short-cross Requirement is implemented	CORE	O	SEQM.0099-Short-cross
Mandatory when any Short-cross Requirement is implemented	CORE	O	SEQM.0101-Short-cross crossing allocation to upstream or downstream

A short-cross is a corrective mechanism intending to remove from the control sequence a responsible entity crossed for a very limited period of time to avoid useless coordinations and transfer of frequency. The condition defining a short cross can be expressed in time, distance, flow and can be locally or bilaterally defined.

Unlike the automatic Skip, the short-cross is not cancellable (unless of course a route amendment makes the crossing time bigger than the short-cross parameter).

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0099
Title	Short-cross
Requirement	When the conditions (time and/or distance) are compliant with the offline defined parameters, an IOP Unit **shall** be able to automatically implement a short-cross that exclude another IOP Unit from the control sequence list for that crossing
Status	<Validated>
Rationale	Transfer of frequency are useless in case of very short crossings.
Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Short-cross Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SEQM.0101
Title	Short-cross crossing allocation to upstream or downstream
Requirement	In case of short-cross, an off-line rule **shall** be used to determine whether the control within this Unit will be granted to the Upstream or the Downstream unit
Status	<Validated>
Rationale	Transfer of frequency is useless in case of very short crossings

Category	<Interoperability>
Implementation	Optional – Core (Mandatory when any Short-cross Requirement is implemented)

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.8 SSR Code Management

To better understand the SSR code management use cases (UC#08XX) take into account the next table:

Assigned SSR Code (IOP_ASSR)	The SSR code instructed to the aircraft by a controlling IOP Unit (the controlling one or a previous controlling one). There's only one IOP_ASSR common for all IOP Units.
Current SSR Code (IOP_CSSR)	The current SSR as shared by the controlling IOP Unit after the reception of the code broadcast by the aircraft. There's only one IOP_CSSR shared with all IOP Units at any one time. In nominal cases, the IOP_CSSR equals the IOP_ASSR.
Next Assigned SSR Code (IOP_NSSR)	The SSR code that the controlling IOP Unit is intending to instruct to the aircraft. There's only one IOP_NSSR shared with all IOP Units at any one time, to ease the correlation maintenance by the IOP Units and it can only be modified by the controlling IOP Unit.
Downstream SSR Code (IOP_DSSR)	The SSR code that each receiving IOP Unit plans to give to the aircraft once controlling it. The IOP_DSSR of an IOP Unit could be blank if the IOP Unit doesn't plan to give a specific SSR code to the aircraft and expects to maintain the IOP_TSSR (if any, otherwise the IOP_ASSR) in his airspace. On the other hand, there could be as many IOP_DSSR as expected controlling IOP Units. The IOP_DSSR of an IOP Unit can be flagged as "requested" when its transferring IOP Unit wants him to provide it.

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	**SSR Code Management**						

		M	SSRC.0001-ASSR Code modifying and sharing
		M	SSRC.0002-NSSR Code modifying and sharing
		M	SSRC.0003-CSSR Code modifying and sharing
Mandatory if DSSR functionality implemented		O	SSRC.0004-DSSR Code modifying and sharing
Mandatory if DSSR functionality implemented		O	SSRC.0005-DSSR request and assignment
Mandatory if DSSR functionality implemented		O	SSRC.0006-Request Code to an IOP unit
Mandatory if DSSR functionality implemented		O	SSRC.0007-Supply Code to an IOP unit
		M	SSRC.0008-Mode S Flight ID
		M	SSRC.0009-Linkage between CSSR and Flight Plan

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0001
Title	ASSR Code modifying and sharing
Requirement	The IOP Unit controlling the flight **shall** be the unique IOP Unit allowed to modify and share the IOP_ASSR in the FO
Status	<Validated>
Rationale	This requirement is needed to prevent that every IOP Unit can change ASSR Code value in IOP environment
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0002
Title	NSSR Code modifying and sharing
Requirement	The IOP Unit controlling the flight **shall** be the unique IOP Unit allowed to modify and share the IOP_NSSR in the FO
Status	<Validated>
Rationale	.This requirement is needed to prevent that every IOP Unit can change NSSR Code value in IOP environment
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0003
Title	CSSR Code modifying and sharing
Requirement	The IOP Unit controlling the flight **shall** be the unique IOP Unit allowed to modify and share the IOP_CSSR in the FO
Status	<Validated>
Rationale	This requirement is needed to prevent that every IOP Unit can change CSSR Code value in IOP environment

Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0004
Title	DSSR Code modifying and sharing
Requirement	IOP Units **shall** be able to modify and share their IOP_DSSR code
Status	<Validated>
Rationale	This requirement is needed to prevent that every IOP Unit can change any DSSR Code value in IOP environment. Downstream SSR codes, if available, will be shared.
Category	<Interoperability>
Implementation	Optional – Mandatory if DSSR functionality implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0005
Title	DSSR request and assignment
Requirement	A Receiving RE **shall** be able to indicate to the Transferring RE that it requires its IOP_DSSR to be assigned to the aircraft.
Status	<Validated>
Rationale	The code intended to be instructed to the aircraft to squawk before exiting your AoR. Normally on request of a downstream partner to enable early correlation
Category	<Interoperability>
Implementation	Optional – Mandatory if DSSR functionality implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0006
Title	Request Code to an IOP unit
Requirement	IOP Units **shall** be able to request an SSR code from another IOP Unit if bilaterally agreed
Status	<Validated>
Rationale	An upstream unit will be able to request a code from a downstream partner.
Category	<Interoperability>
Implementation	Optional – Mandatory if DSSR functionality implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0007
Title	Supply Code to an IOP unit
Requirement	IOP Units **shall** be able to provide requesting IOP Units with an SSR code if requested
Status	<Validated>
Rationale	A downstream IOP Unit will be able to provide an upstream IOP Unit with a code following a request.
Category	<Interoperability>
Implementation	Optional – Mandatory if DSSR functionality implemented

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0008
Title	Mode S Flight ID
Requirement	IOP Units **shall** be able to share the Mode S Flight ID and address.
Status	<Validated>
Rationale	For identification the Mode S flight ID (call-sign received in Mode S data) will be shared even if different from the Flight Plan ID.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-SSRC.0009
Title	Linkage between CSSR and Flight Plan
Requirement	The controlling IOP Unit **shall** change and share the IOP_CSSR as soon as it detects it from the track and is able to correlate the track with the flight plan
Status	<Validated>
Rationale	This requirement prevent to share every code (also erroneous) received
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.9 Air/Ground

INTEROP CHAPTERS									
REQUIREMENTS FOR INTEROPERABILITY	M	**Air - Ground**							

IMPLEMENTATION RULE		***BASIC IOP REQUIREMENTS***	
		M	COTR.0101-Notify the receiving unit
		M	COTR.0100-Datalink Parameters
		O	COTR.0136-Contact vs. Monitor

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0101
Title	Notify the receiving unit
Requirement	The Current Data Authority IOP Unit **shall** notify the Next Data Authority IOP Unit when the subject aircraft is authorised to accept a CPDLC connection request from the Receiving IOP Unit.
Status	<Validated>
Rationale	The receiving IOP Unit needs to be aware that they can initiate CPDLC contact.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0100
Title	Datalink Parameters
Requirement	IOP Units **shall** provide the other IOP Units with the updated aircraft ATN or FANS/1A logon parameters
Status	<Validated>
Rationale	Sharing the logon parameters allows the unit to use the data link applications (CM, CPDLC, ADS-C).
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-COTR.0136
Title	Contact vs. Monitor
Requirement	When an aircraft is transferred, the Transferring RE **shall** indicate whether the aircraft has been instructed to "contact" or "monitor" the Receiving RE.
Status	<Validated>
Rationale	The Receiving RE must know if the Transferring RE instructed the Aircraft not to Contact but to Monitor on the Receiving frequency (CPDLC UM120, UM121 & UM122).
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

4.3.10Handling of IOP Protocol Failures

INTEROP CHAPTERS									
REQUIREMENTS FOR INTEROPERABILITY	M	**Handling of IOP Protocol Failures**							

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		M	FSMG.0076-Discrepancy with the published FO
		M	FSMG.0078-De-synchronisation reason publication
		M	FSMG.0082-Removal of de-synchronisation warning
		M	FSMG.0083-Coordination During De-synchronisation

In this feature we identify the operational / human related consequences of technical failures:

- FDMP selection failure. Several SIs are trying to publish the same FO. The FDMP determination procedure is not working and therefore some human operator should determine which system should be the FDMP. In addition, a mechanism to return to the nominal situation needs to be identified.

- FDC requests cannot reach the FDMP either because of local or network problem.

- FOs are not removed from the network by the last FDMP.

- An IOP unit becomes de-synchronized for a specific Flight Object, and this should not prevent all IOP actions, depending of the level of de-synchronization (for instance, coordination dialogue should still be possible of trajectory computation are different)

Receiving a FO should trigger a number of data synchronization activities between the data included in the FO and the local view of the flight.

Whenever this synchronization fails (For example, a new FO does not allow the creation of the local SFPL or the coordination data cannot be processed locally) some kind of measures need to be defined.

Some kind of detached status may need to be defined while the correction measures are executed.

It includes the warning to a proper human actor/s as well as the facilities to correct the received data).

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0076
Title	Discrepancy with the published FO
Requirement	In case of discrepancy between elements of data contained in the Flight Object and its local view, an IOP Unit **shall** : • adapt its local view to match it with the Flight Object, or • ask for a modification of the Flight Object in order to better describe the expected behaviour, or • according to the severity of the discrepancy, share a desynchronisation warning and/or trigger a manual correction.
Status	<Validated>
Rationale	An IOP Unit receiving an updated FO must check the synchronization of the FO with its local view and react in case of discrepancy. It covers the Flight Script (list of constraints), the trajectory computation, the control sequence, the C&T data…
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0078
Title	De-synchronisation reason publication
Requirement	When an IOP Unit shares a de-synchronisation warning, it **shall** provide information on the item that triggered the de-synchronization.
Status	<Validated>

Rationale	If a de-synchronisation exists downstream partners need to be aware of it. It is of interest to them to know which items are de-synchronized when they need to coordinate with this unit
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0082
Title	Removal of de-synchronisation warning
Requirement	When the IOP Unit that shared a de-synchronisation warning considers it to be no longer necessary, it **shall** remove this warning.
Status	<Validated>
Rationale	It should be possible to remove the warning if it is unnecessary
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-FSMG.0083
Title	Coordination During De-synchronisation
Requirement	The addition, modification or deletion of C&T data **shall** remain possible for any IOP Unit in case of de-synchronisation.
Status	<Validated>
Rationale	If the C&T data is linked to the desynchronization, it is needed to be able to change it again to have a chance to solve the desynchronization. If the C&T data has nothing to do with the desynchronization, it should be possible to modify it despite the desynchronization. It is accepted that the desynchronization may not be resolved by the change of this C&T data.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

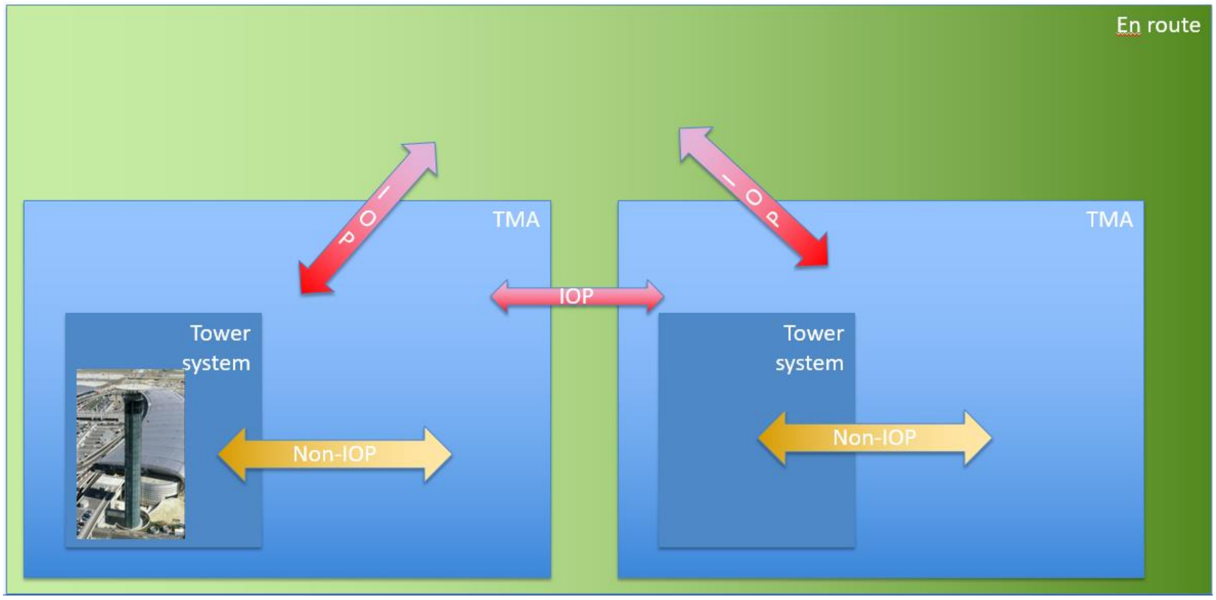
4.3.11TMA Requirements

This feature through IOP encompasses a global scope of arrival and departure management which includes the ATC procedures and data related to it.

This is one of the most important process in the beginning and end phase of a flight.

The feature focuses on resolving the existing issues, addressing the global IOP scope, analysing its impact on route and filling the gaps by defining use cases to cover operational scenarios and system cases for technical solutions.

This issue has already been addressed at WG59 level (OI#19) and almost agreed in a final solution that includes some improvements on route management that are not specific to arrival and departure data and that can be used in IOP scope.



Scope of IOP exchanges with TMA

NOTE: The implementation of all TMA requirements listed in this chapter need to be satisfied by the unit that involved in TMA operation.

as “optional” and “Core – Mandatory for any unit involved in TMA operation”.

INTEROP CHAPTERS									
REQUIREMENTS FOR INTEROPERABILITY	M	**TMA Requirements**							

IMPLEMENTATION RULE			***BASIC IOP REQUIREMENTS***
		M	ADMG.0001-Sharing of AMAN information
		M	ADMG.0002-EOBT Processing
		M	ADMG.0003-ETOT Processing
		M	ADMG.0004-ATOT Processing
		M	ADMG.0005-Departure Information Flags
		M	ADMG.0006-Take-Off Information Flags
		M	ADMG.0007-Sharing AMAN delay information
		M	ADMG.0008-AMAN delay information content
		M	ADMG.0009-Estimate calculation based on take-off time (CDM Airport)
		M	ADMG.0010-Estimate calculation based on take-off time (non-CDM Airport)
		M	ADMG.0011-Share of Active Departure-Arrival runway Information

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0002
Title	EOBT Processing
Requirement	An IOP Partner **shall** share a received EOBT for a flight.
Status	<Validated>
Rationale	The EOBT could be used to compute ETO's prior to departure.
Category	<IER><Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0003
Title	ETOT Processing
Requirement	An IOP Partner **shall** share a received ETOT for a flight.
Status	<Validated>
Rationale	The ETOT could be used to compute ETO's prior to departure.
Category	<IER><Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0004
Title	ATOT Processing
Requirement	An IOP Partner **shall** share a received ATOT for a flight.
Status	<Validated>
Rationale	The ATOT could be used to compute ETO's prior to departure.
Category	<IER><Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0005
Title	Departure Information Flags

Requirement	A flag **shall** be available in the FO indicating that either of the following events has occurred: • Start-up clearance, • Push-back clearance, • Taxi clearance.
Status	<Validated>
Rationale	The issuing of either of the above information can be beneficial to an ATCO.
Category	<Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0006
Title	Take-Off Information Flags
Requirement	A flag **shall** be available in the FO indicating that either of the following events has occurred: • Take-off clearance input, • Flight is detected airborne.
Status	<Validated>
Rationale	The issuing of either of the above information can be beneficial to an ATCO.
Category	<Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0007
Title	Sharing AMAN delay information
Requirement	AMAN delay information **shall** be shared with all upstream IOP units
Status	<Validated>
Rationale	To enable delaying actions to be performed by units that may be some distance upstream of the ADES.
Category	<IER><Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0008
Title	AMAN delay information content
Requirement	AMAN delay information **shall** consist of at least one of the following items: • Absolute speed request (Mach or KIAS) • Speed change request in Mach or KIAS • Time-to-lose/time-to-gain (TTL/TTG) (mm:ss) • Target time (hh:mm:ss) at specified waypoint AMAN requested delay information may additionally include the following items: • Position in arrival sequence (number xx)
Status	<Validated>
Rationale	A number of data types are supported to enable IOP to support different AMAN methods of operations
Category	<Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0009
Title	Estimate calculation based on take-off time (CDM Airport)
Requirement	The most accurate of the following data **shall** be shared using the following order of priority (in case of a CDM airport): 1. Actual Take Off Time 2. Target Take Off Time(TTOT) 3. Calculated Take Off Time (CTOT) 4. Estimated Take Off Time (ETOT) calculated from the EOBT
Status	<Validated>
Rationale	Estimates have to use the most recent updates.
Category	<IER><Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0010
Title	Estimate calculation based on take-off time (non-CDM Airport)

Requirement	The most accurate of the following data **shall** be shared using the following order of priority (in case of a non CDM airport): 1. Actual Take Off Time(ATOT) 2. An estimate of the take-off time computed from the time of "start-up clearance", "push-back clearance ", "taxi clearance " or the occurrence of a similar event from which the take-off estimate may be derived 3. Calculated Take Off Time (CTOT) 4. Estimated Take Off Time (ETOT) calculated from the EOBT
Status	<Validated>
Rationale	Estimates have to use the most recent updates.
Category	<IER><Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b-SPRINTEROP-ADMG.0011
Title	Share of Active Departure-Arrival runway Information
Requirement	An IOP Unit **shall** share the active departure or arrival runway.
Status	<Validated>
Rationale	The IOP Units expected to control the flight receive the up-to-date departure-arrival information of the flight.
Category	<IER><Interoperability>
Implementation	Optional - Mandatory for any unit involved in TMA operation

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

5 References and Applicable Documents

5.1 Applicable Documents:

Content Integration

[1] B.04.01 D138 EATMA Guidance Material

[2] EATMA Community pages

[3] SESAR ATM Lexicon

Content Development

[4] B4.2 D106 Transition Concept of Operations SESAR 2020

System and Service Development

[5] 08.01.01 D52: SWIM Foundation v2

[6] 08.01.01 D49: SWIM Compliance Criteria

[7] 08.01.03 D47: AIRM v4.1.0

[8] 08.03.10 D45: ISRM Foundation v00.08.00

[9] B.04.03 D102 SESAR Working Method on Services

[10]B.04.03 D128 ADD SESAR1

[11]B.04.05 Common Service Foundation Method

Performance Management

[12]B.04.01 D108 SESAR 2020 Transition Performance Framework

[13]B.04.01 D42 SESAR2020 Transition Validation

[14]B.05 D86 Guidance on KPIs and Data Collection support to SESAR 2020 transition.

[15]16.06.06-D68 Part 1 –SESAR Cost Benefit Analysis – Integrated Model

[16]16.06.06-D51-SESAR_1 Business Case Consolidated_Deliverable-00.01.00 and CBA

[17]Method to assess cost of European ATM improvements and technologies, EUROCONTROL (2014)

[18]ATM Cost Breakdown Structure_ed02_2014

[19]Standard Inputs for EUROCONTROL Cost Benefit Analyses

[20]16.06.06_D26-08 ATM CBA Quality Checklist

[21]16.06.06_D26_04_Guidelines_for_Producing_Benefit_and_Impact_Mechanisms

Validation

[22]03.00 D16 WP3 Engineering methodology

[23]Transition VALS SESAR 2020 - Consolidated deliverable with contribution from Operational Federating Projects

[24]European Operational Concept Validation Methodology (E-OCVM) - 3.0 [February 2010]

System Engineering

[25]SESAR 2020 Requirements and Validation Guidelines

Safety

[26]SESAR, Safety Reference Material, Edition 4.0, April 2016

[27]SESAR, Guidance to Apply the Safety Reference Material, Edition 3.0, April 2016

[28]SESAR, Final Guidance Material to Execute Proof of Concept, Ed00.04.00, August 2015

[29]SESAR, Resilience Engineering Guidance, May 2016

Human Performance

[30]16.06.05 D 27 HP Reference Material D27

[31]16.04.02 D04 e-HP Repository - Release note

Environment Assessment

[32]SESAR, Environment Reference Material, alias, "Environmental impact assessment as part of the global SESAR validation", Project 16.06.03, Deliverable D26, 2014.

[33]ICAO CAEP – "Guidance on Environmental Assessment of Proposed Air Traffic Management Operational Changes" document, Doc 10031.

Security

[34]16.06.02 D103 SESAR Security Ref Material Level

[35]16.06.02 D137 Minimum Set of Security Controls (MSSCs).

[36]16.06.02 D131 Security Database Application (CTRL_S)

5.2 Reference Documents

[37]P04.05 D823, TMF INTEROP for step 1, Initial Release, 2015

[38]Commission Regulation (EC) No 1032/2006 of 6 July 2006 laying down requirements for automatic systems for the exchange of flight data for the purpose of notification, coordination and transfer of flights between air traffic control units

[39]P04.05, TMF Technical Note for 2014, D822, Edition 01.00.00

[40]ED-133 Flight Object Interoperability Specification, June 2009

[41]EUROCONTROL-SPEC-106, EUROCONTROL Specification for On-Line Data Interchange (OLDI), Edition 5.0, 14/07/2020

[42]IOP Feature 1 Deliverable, Edition 01.00.03, 30/09/2016

[43]IOP Feature 2 Deliverable, Edition 00.01.02, 30/11/2016

[44]IOP Feature 5 Deliverable, Edition 00.00.06, 30/11/2016

[45]IOP Feature 8 Deliverable, Edition 00.03.00, 10/12/2016

[46]P10.02.05, 18.02b-TRL6-INTEROPIOP ATC System Requirements (Final IOP TS), D55, Edition 00.00.01

[47]Commission Regulation (EC) No 677/2011 of 7 July 2011

[48]Doc 4444 Procedures for Air Navigation Services, Sixteenth Edition, 2016

[49]Manual on Flight and Flow –Information for a Collaborative Environment (FF-ICE) (Doc 9965)

Appendix A Operational benefits assessment

The following document provides a discussion on the expected IOP benefits by looking at eighteen areas of improvements that would come with IOP.

A qualitative assessment is made as we have not yet been able to do any validation including measurements of quantified benefits.

This document also provides a proposal regarding a method to estimate the workload reduction brought by IOP focusing on the coordination process.

IOP Benefits_v6.1-for INTEROP.docx

Appendix B Safety Assessment

The safety assessment has been conducted through a series of Hazard Identification Sessions.

These sessions have categorized the various hazards

The operational hazards relevant for the IOP Solution (addressing the Operational use cases/ Activities validated with the Solution) are identified within a series of dedicated HAZID sessions involving relevant Solution operational and technical experts.

The operational hazards relevant to the Solution are either those existing in current operations (prior to IOP introduction) and which might be affected by the change represented by IOP in terms of causes, mitigations or operational effects; or new operational hazards introduced by the change represented by IOP.

Each identified operational hazard is further evaluated in terms of operational effects considering the available protective mitigation means and a severity level is allocated using the SESAR Severity Classification Scheme (SCS).

At this stage of the Solution safety assessment only preliminary information regarding the causes of the operational hazards and associated preventive mitigation are collected.

In addition the technical hazards identified in different sessions involving technical experts have been analysed and categorized according to their operational impact.

The assessment comprises two documents:

- An identification of the generic operational use cases that are considered to be impacted by IOP, here:

IOP_Use Cases
List_ENR-TMA_v06.do

- The Hazard Identification sessions conclusions:

IOP_HAZID_v1.0.docx

Appendix C NM-ATC interface (Solution 18-02b1)

C.1 Introduction

The IOP concept foresees the integration of NM in the network of interconnected ATC systems. This integration was foreseen in the context of Basic IOP (level of functionality needed to fulfil what was defined as the CP1 requirements), but was allocated to a different SESAR solution, as shown on the figure here:

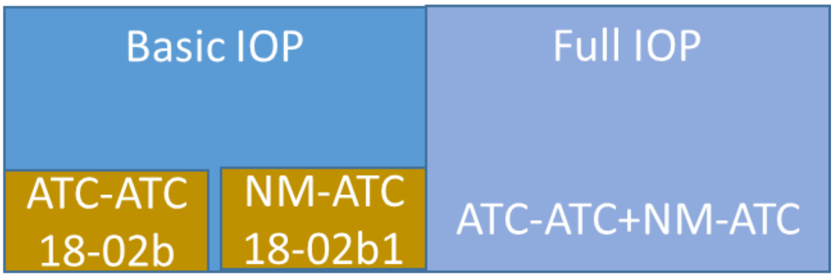


Figure 54: IOP scope

In solution PJ18-02b, the Flight Object is created by the first (in nominal conditions) IOP Unit to be crossed by the flight. When NM is integrated into the IOP network, NM will create (in nominal conditions) the Flight Object, using most recent data on the flight and the constraints applicable to it. FO mechanisms will be used to replace all existing point-to-point exchanges between NM and ATC (other than B2B exchanges between NM and FMP). Eligibility rules have been designed in order to avoid conflicts when NM and ATC information are not aligned.

In line with FF-ICE implementation, NM has a key role in the management of the trajectory submitted by the Airspace Users: NM supports the submission of the shared trajectory by both Civil and Military Airspace Users in Planning; NM ensures the CDM agreement among all partners for the transition to the Reference Trajectory and its revision during Execution.

NM will fulfil the following roles and responsibilities for each flight[1]:

- NM creates the initial version of the Flight Object (i.e. the flight data, including the applicable constraints and the resulting flight script and IOP trajectory); this takes place at an appropriate time before departure or before entering the IOP airspace (whichever applies).
- NM shares it with all the involved IOP Units and ensures a common view with other stakeholders.
- NM maintains the FO and shares any update, until the first IOP-capable Unit takes over the responsibility for that flight.
- When an IOP Unit is responsible for the FO, NM provides to that IOP Unit any update from the AU or any contribution (e.g. updated constraint) received from a Unit which

[1] In line with the outcome of the *'CFMU FOS Study' of 2008/9*. More detailed operational scenarios and considerations are provided in the D1 document of that study

is not capable of communicating to the responsible IOP Unit directly (i.e. contributions from non-IOP capable Units).

- For all flights under the responsibility of an IOP Unit, NM receives any update of the FO at any time.

C.2 NM-ATC integration detailed use cases

UC#	Feature	Title
UC#1201	#12	Flight Object creation
UC#1202	#12	Flight Data Exchange with NM
UC#1203	#12	Flight Suspension and de-suspension
UC#1204	#12	Flight Plan Cancellation
UC#1205	#12	Impact of CTOT allocation, modification, cancellation and its use (by IOP partners' TP)
UC#1206	#12	Updates of Trajectory based on CDM airport's message (DPI)
UC#1207	#12	Constraint application update
UC#1209	#12	Transfer of FO management responsibility to the first IOP

C.2.1 UC#1201: Flight Object Creation with NM-IOP

This use case describes the creation of the FOs either by NM based on the validated flight plan data information or by an IOP Unit which becomes aware of a flight for which no corresponding flight plan data exists, or which is informed of a flight for which a flight plan exists but that was originally not planned to enter neither IOP nor its airspace.

Actors

- NM – the first IOP Unit to become aware of the flight plan data information.
- AO – Aircraft Operator providing the flight plan data (*Note: the flight plan data can be either in the form of a FPL or eFPL*).
- Unit-A – the first IOP ANSP Unit entering SAP (First Unit with its AOR being crossed)
- Unit-B – a non-IOP ANSP Unit that provides NM with flight plan data information for a missing FPL.

Preconditions

1. The conditions triggering the creation of the FO are fulfilled (i.e. the Area of Interest of at least one IOP Unit is crossed – in this case the Unit-A).
2. The flight plan data received by NM is operationally valid.
   Note: If the flight plan data is not valid and has not been valid before (i.e. has been rejected following evaluation/validation process), then no FO will be created.

Assumptions

Sub-UC1

1. The flight plan data information originator is the Operator.
2. The flight is before departure.

Sub-UC2:

1. the flight is in execution
2. the flight plan data information originator is an IOP Unit

Sub-UC3:

1. the flight is in execution
2. the flight plan data information originator is a non-IOP Unit

Operational Activity Description

Sub-UC1 – The flight plan data information is submitted by an AO.

Step	Operating Method	V&V	Requirement
1	AO/FOC submits/files flight plan data information with NM. *Note: this can be in the form of FPL or eFPL.*	O/S	European Flight Planning Requirements
2	NM confirms that flight plan data is 'operationally valid'	S	IFPS Specification
3	NM verifies that no corresponding FO exists and the flight is planned to cross the IOP Area.	S	Tech requirements (see UC#301) FPMG.0001
4	A parameter time before EOBT (e.g. EOBT-2h), NM creates the corresponding FO including: • all the strategic constraints NM is aware of, • All control sequence information tuning that NM is aware of, • the source of the flight plan data and the originator.	S	GENE.0003 FSMG.0001 FSMG.0085 FPMG.0002
5	Upon FO creation NM shares the FO with all IOP Units whose AoI is traversed by the flight trajectory and other required IOP Units according to established bilaterally agreed rules.	S	SEQM.0006 SEQM.0007 FSMG.0001 GENE.0001
6	Unit-A enters SAP (its AOR is crossed and condition to enter in SAP reached) and shares its status.	S	COTR.0001

Step	Operating Method	V&V	Requirement
7	Unit-A : • Shares additional constraints and/or updates the applied ones, • updates information related to the control sequence if needed.	S	GENE.0004 FSMG.0010 SEQM.0015
8	NM assesses and Updates the FO according to the request provided by the Unit-A.	S	FSMG.0028 FPMG.0006

Table 112:Operating Method for the flight plan data information is submitted by an AO

<u>Sub-UC2 – The flight plan data information is provided by an IOP Unit.</u>

Step	Operating Method	V&V	Requirement
1	Unit-A becomes aware of a flight for which no corresponding flight plan data exists. (required verifications have been performed by the Unit), or it is informed of a flight for which a flight plan exists but that was not planned to enter IOP area, etc..	-	None
2	Unit-A creates the corresponding FO including: • all the strategic and/or planning constraints Unit-A is aware of, • all control sequence corrections that Unit-A is aware of, • the source of the flight plan data and the originator.	S	GENE.0003 FSMG.0001 FPMG.0002
3	Upon FO creation Unit-A shares the FO with all IOP Units whose AoI is traversed by the flight trajectory, with NM and other required IOP Units according to established bilaterally agreed rules. *Note: NM airspace is always crossed*	S	SEQM.0006 SEQM.0007 SEQM.0011 GENE.0001 FPMG.0003
4	Upon FO reception the NM will: • share any additional constraints (normally outside the Unit A AoR), and • updates information related to the control sequence if needed.	S	GENE.0004 FSMG.0085
5	Unit-A assesses and updates the FO according to the input received.	S	FSMG.0028 FPMG.0006

Table 113:Operating Method for the flight plan data information is provided by an IOP Unit

Sub-UC3 – The flight plan data information is provided by a non-IOP Unit.

Step	Operating Method	V&V	Requirement
1	Unit-B becomes aware of a flight for which no corresponding flight plan data exists. (required verifications have been performed by the Unit).	-	None
2	Unit-B provides NM with the flight plan data information in the form of an AFP.	S	European Flight Planning Requirements
3	NM performs flight plan data validation and the FPL is 'operationally valid'	S	IFPS Specification
4	NM verifies that no corresponding FO exists and the flight is planned to cross the IOP Area.	S	Tech requirements (see UC#301) FPMG.0001
5	NM creates the corresponding FO including: • all the strategic constraints NM is aware of. • all control sequence information tuning that NM is aware of, • the source of the flight plan data and the originator	S	GENE.0003 FSMG.0001 FSMG.0085 FPMG.0002
6	Upon FO creation NM shares the FO with all IOP Units whose AoI is traversed by the flight trajectory and other required IOP Units according to established bilaterally agreed rules.	S	SEQM.0006 SEQM.0007 GENE.0001
7	Sub-UC continues with step 6 of the sub-UC1		

Table 114: Operating Method for The flight plan data information is provided by a non-IOP Unit

C.2.2 UC#1202: Flight Data Exchange with NM

This use case describes the provision of the FO updates by NM to all relevant IOP units, updates resulting from flight plan changes (DLA, CHG – flight plan filing related messages) sent by AO, or from flight evolution updates (AFP - ATC Flight Plan Proposal Message) sent by Units.

With the IOP solution, the distribution of the initial flight plan performed by NM is performed with the creation and distribution of the Flight Object. In the future this will replace the current implementation of sending IFPL message for initial flight plan for IOP enabled Units.

Actors

- NM – the first IOP Unit to become aware of the flight plan data information.
- AO – Aircraft Operator providing the flight plan data (Note: the flight plan data can be either in the form of an FPL or eFPL).
- Unit-A – a non-IOP Unit that is controlling the flight before entering the IOP Area.

- Unit-B and Unit-F - Relevant IOP Unit– the IOP Unit who's Area of Responsibility is originally traversed by the flight's trajectory.
- Unit-C and Unit E – IOP Unit who's area of responsibility is not originally planned to be traversed and are adjacent to Unit B and Unit-F respectively
- Unit-D – non-IOP unit that will be controlling the flight in the gap between the IOP units

Preconditions

1. The FO has already been created and shared by NM based on filed flight plan information from the AO (FPL or eFPL).

Assumptions

1. The flight is before departure - sub-UC1.

2. Route change of a flight under the control of a non-IOP Unit (before entering the IOP area) resulting in a change of the next Unit. The route change is performed before the ACT message is sent to Unit-B by Unit-A - sub-UC2. If the route change is performed after the ACT message being sent to Unit-B the UC remains valid but the update of the FO will not be performed directly by NM but based on the NM request for FO update to Unit-B.

3. Route change of a flight under the control of a non-IOP Unit (that is in a gap of the IOP area) resulting in a change of the next Unit – sub-UC3, The route change is performed before the ACT message is sent to Unit-E by Unit-D. If the route change is performed after the ACT message being sent to Unit-E the UC remains valid but the update of the FO will not be performed directly by NM but based on the NM request for FO update to Unit-E.

The figure below details graphically the sub-UC2 and sub-UC3 situations as well as the Actors involved.

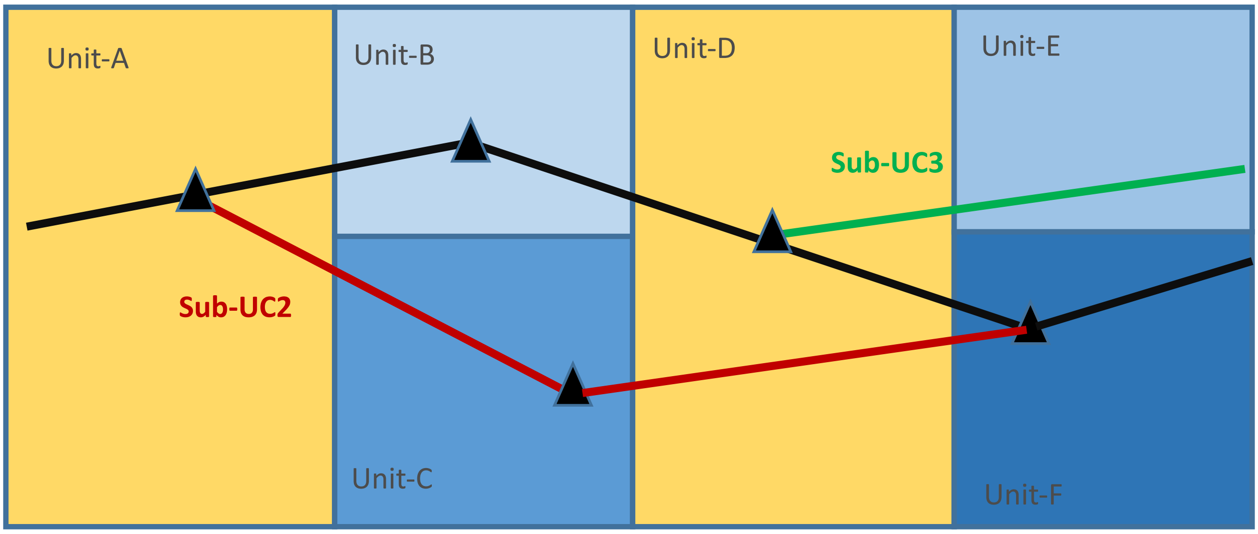


Figure 55: UC#1202 Sub-UC2 and Sub-UC3 situations and Actors

Operational Activity Description

Sub-UC1 – The flight is before departure and the AO informs of flight plan updates

Step	Operating Method	V&V	Requirement
1	AO provides NM with a DLA message indicating a change of the EOBT.	O	IFPS Specification
2	NM reassesses constraints and updates the FO reflecting the impact of the new EOBT.	S	FSMG.0028 FPMG.0006
3	NM makes the updated FO available to all IOP Units in the distribution list.		FSMG.0001 GENE.0001 SEQM.0006
4	AO provides NM with an ICAO FPL CHG message indicating a change of route making the flight no longer crossing Unit-B AoR	O	IFPS Specification
5	NM reassesses constraints and updates the FO to reflect the new route.	S	FSMG.0028 FPMG.0006
6	NM modifies the control sequence and the distribution list according to the new route/trajectory.	S	SEQM.0012 SEQM.0040
7	NM makes the updated FO available to all IOP Units in the updated distribution list. • shares the updated Flight information with the new downstream Units, • shares the updated Flight information with the new IOP Units of the distribution list, • informs the IOP Units that are no longer crossed, • informs the IOP Units to which the Flight information will no longer be distributed.	S	FSMG.0001 SEQM.0006 SEQM.0088 SEQM.0096

Table 115: Operation Method for AO updates before departure

Sub-UC2 – Route change of a flight under the control of a non-IOP Unit (before entering the IOP area) resulting in a change of the next Unit.

Step	Operating Method	V&V	Requirement
1	The flight is under the control of the Unit-A and NM is the IOP Unit responsible for the update of the FO	O	
2	Unit-A provides NM with an AFP message indicating a route change and a change of the next downstream Unit (to Unit-C).	O	IFPS Specification
3	NM reassesses constraints and updates the FO reflecting the impact of the route change.	S	FSMG.0028 FPMG.0006

Step	Operating Method	V&V	Requirement
1	The flight is under the control of the Unit-A and NM is the IOP Unit responsible for the update of the FO	O	
4	NM modifies the control sequence and the distribution list according to the new route/trajectory.	S	SEQM.0012 SEQM.0040
5	NM makes the updated FO available to all IOP Units in the updated distribution list. • shares the updated Flight information with the new downstream Units, • shares the updated Flight information with the new IOP Units of the distribution list, • informs the IOP Units that are no longer crossed, • informs the IOP Units to which the Flight information will no longer be distributed.	S	FSMG.0001 SEQM.0096 SEQM.0088 SEQM.0006

Table 116: Operating method for route change whenin non iop unit

Note: Depending on the moment when the route change is performed (vis-à-vis the OLDI ACT message issuance) the updates of the FO can be performed by the Unit-B and not NM.

Sub-UC3 – Route change of a flight under the control of a non-IOP Unit (that is in a gap of the IOP area) resulting in a change of the next Unit.

Step	Operating Method	V&V	Requirement
1	The flight is under the control of the Unit-D and Unit-B is the IOP Unit responsible for the update of the FO.		
2	Unit-D provides NM with an AFP message indicating a route change and a change of the next downstream Unit (to Unit-E).	O	IFPS Specification
3	NM request Unit-B the update the FO to reflect the impact of the route change.	S	FSMG.0028 FPMG.0006
4	Unit-B modifies the control sequence and the distribution list according to the new route/trajectory.	S	SEQM.0012 SEQM.0040

Step	Operating Method	V&V	Requirement
5	Unit-B makes the updated FO available to all IOP Units in the updated distribution list. • shares the updated Flight information with the new downstream Units, • shares the updated Flight information with the new IOP Units of the distribution list, • informs the IOP Units that are no longer crossed, • informs the IOP Units to which the Flight information will no longer be distributed.	S	FSMG.0001 SEQM.0096 SEQM.0088 SEQM.0006

Table 117: Operating method for route change non iop unit changing downstream

C.2.3 UC#1203: Flight 'Suspension' and 'de-suspension'

This use case describes the flight suspension that is performed by the Network Manager (NM) as result of:

1. flight plan reprocessing process (revalidation) when the flight enters a CDR (Conditional Route), and
2. as result of the flight activation monitoring (FAM) process.

Each process is subject to an individual sub-use case.

Actors

- NM – the first IOP Unit to become aware of the flight plan data information.
- AO – Aircraft Operator providing the FPL data. (*Note: the flight plan data can be either in the form of an FPL or eFPL*).
- Unit-A – the first IOP Unit to enter SAP.

Preconditions

1. The corresponding FO has already been created and shared by NM (see UC#1201).

Assumptions

1. The flight is before departure
Note 1: If the flight is in execution, the sub use case 1 is not applicable (the FPL reprocessing stops for flight that took off). However the sub use case 2 is still applicable, as the flight might have taken-off but NM is not aware of this.
2. The FO Updates are performed by NM. Should this not be the case, the sub-UCs remain valid but the NM will request the update of the FO rather than performing the update itself.

Operational Activity Description

Sub Use Case 1 - flight suspension as result of flight plan reprocessing (revalidation)

Step	Operating Method	V&V	Requirement
1	A CDR (CDR A) used by the flight had its activation time changed such that it is activated earlier.	O	European UUP (Updated Use Plan)
2	At the time when NM performs FPL reprocessing, it discovers that the flight enters the CDR A. As such the FPL is suspended – FPL gets the status 'suspended'.	O/S	ATFCM Spec and IFPS Spec
3	NM informs accordingly the AO/FOC – with means other than IOP – that the flight has been suspended. *Note: for eFPL this will be reflected through the Filing Status update to 'Not Acceptable'.*	O/S	ATFCM Spec and IFPS Spec
4	NM shares the suspended status with all IOP Units concerned.	S	GENE.0001 SEQM.0006 SEQM.0011 FPMG.0006 GENE.0006
5	AO reacts and provides a CHG message rerouting the flight to avoid the CDR A. *Note: for eFPL this will be reflected through an eFPL Update.*	O/S	IFPS Spec
6	NM processes (including validation) the CHG message and as result the flight is no longer suspended.	O/S	IFPS Spec
7	NM updates the corresponding FO indicating the flight is no longer suspended, and publishes the updated FO to all IOP ATSUs concerned.	S	GENE.0001 SEQM.0006 SEQM.0011 FPMG.0006 GENE.0006
8	NM informs accordingly the AO/FOC – with means other than IOP – that the flight has been De-suspended. *Note: for eFPL this will be reflected through the Filing Status update back to 'Acceptable'*	O/S	ATFCM Spec and IFPS Spec

Table 118: Operating method flight suspension for fpl reprocessing

Sub Use Case 2 - flight suspension as result of flight activation monitoring process (valid only for FAM areas)

Step	Operating Method	V&V	Requirement
1	The ETOT (Estimated Take-Off Time) has passed, but NM did not receive any report that that flight departed. *Note: through CPR (Correlated Position Report), FSA (First System Activation) or DEP (Departure) info.*	O/S	ATFCM Spec
2	NM shifts the TOT (Take-Off Time) by 5 min, updates the corresponding shared Flight data and publishes it to the concerned IOP Units. *Note: every 5 minutes this shift is repeated until NM receives a report that the flight departed*	O/S	GENE.0001 SEQM.0006 SEQM.0011 FPMG.0006
3	If no report that the flight departed is received when the time reaches 30 minutes after the ETOT, NM suspends the flight.	O/S	ATFCM Spec
4	NM informs accordingly the AO/FOC – with means other than IOP – that the flight has been suspended.	O/S	ATFCM Spec and IFPS Spec
5	NM updates the corresponding shared Flight data indicating the flight has been suspended and publishes the updated shared Flight data to all IOP Units concerned.	S	GENE.0001 SEQM.0006 SEQM.0011 GENE.0006
6	AO provides a DLA (Delay) message containing the new EOBT (Estimated Off-Block Time).	O/S	IFPS Spec ATFCM Spec
7	NM processes (including validation) the DLA message and as result the flight is no longer suspended.	O/S	IFPS Spec ATFCM Spec
8	NM updates the corresponding shared Flight data indicating the flight is no longer suspended, and publishes the updated shared Flight data to all IOP Units concerned.	S	GENE.0001 SEQM.0006 SEQM.0011 FPMG.0006 GENE.0006
9	NM informs accordingly the AO/FOC – with means other than IOP – that the flight has been De-suspended.	O/S	ATFCM Spec and IFPS Spec

Table 119: Flight suspension for flight activation monitoring

C.2.4 UC#1204: Flight Plan Cancellation

This use case describes the flight plan cancellation impact on the existing FO.

Actors

- NM – the first IOP Unit to become aware of the flight plan data information.
- AO – Aircraft Operator providing the flight plan data (Note: the flight plan data can be either in the form of an FPL or eFPL).
- Relevant IOP Units (Unit-A and Unit-B) – the IOP Units who's Area of Responsibility is traversed by the flight's trajectory or they require the FO as result of established bilaterally agreed rules.

Preconditions

1. The corresponding FO has already been created and shared by NM (see UC#1201).
2. Unit A and Unit B are in SAP.

Assumptions

1. The flight is before departure (clock is prior to EOBT)
   Note: Should the flight have already departed (i.e. flight was activated in NM system[2]), the NM system will reject cancellation information in step 1. The flight should follow a diversion procedure in this situation.
2. The NM is the responsible entity updating the FO
   Note: When NM is not the responsible entity for updating FO, it will provide that responsible entity with the necessary information for the FO cancellation if the information has not been shared already by that entity.

Operational Activity Description

The AO decides to cancel the flight operation

Step	Operating Method	V&V	Requirement
1	A CNL message is sent to the NM by the AO, or his representative, prior to EOBT, for whatever reason.	O	IFPS Specification
2	NM distributes the Flight Object for this flight notifying of the flight cancellation. *Note: If NM is not the responsible entity for updating the FO then it will share the cancellation information with that responsible entity allowing it to update the FO accordingly.*	S	GENE.0001 GENE.0003 SEQM.0088 SEQM.0096 FPMG.0005

[2] The activation of a flight in the NM systems occurs:

– When the flight is reported to be airborne through an FDI, FSA, CPR, AFP, FNM, MFS or APR message.

– When the flight is reported to be off-blocks through an ATC DPI (concerns CDM airports and Advanced Tower airports).

– At the departure time received in a DEP message.

Step	Operating Method	V&V	Requirement
3	The Relevant IOP Units remove the information related to the cancelled flight from their systems according to local rules.	S	Local Specification

Table 120: Flight plan cancellation

C.2.5 UC#1205: Impact of CTOT issuance, modification, cancellation and its use (by IOP partners' TP)

This use case describes the impact of the CTOT (Calculated Take-Off Time) issuance, modification and cancellation on an existing FO.

Actors

- NM – the first IOP Unit to become aware of the flight plan data information.
- AO – Aircraft Operator providing the flight plan data (Note: the flight plan data can be either in the form of an FPL or eFPL).
- Relevant IOP Units – the IOP Units who's Area of Interest is traversed by the flight's trajectory or they require the FO as result of established bilaterally agreed rules.

Preconditions

1. The corresponding FO has been created and shared by NM (see UC#1201).
2. The departure airport (ADEP) either belongs to the IOP area or is close to its boundary, so that IOP trajectory starts from the ADEP's reference location. If not the UC remains valid but CTOT will be used to update the entry time in the IOP area.
3. The flight is before departure (clock is prior to EOBT)
4. The flight is subject to regulation(s)

Operational Activity Description

Step	Operating Method	V&V	Requirement
1	At EOBT-2h, NM issues CTOT1 to AO for the impacted flight. CTOT1 is the result of application of an active regulation (REG_A).	S/O	ATFCM requirements
2	NM updates the FO to reflect the impact of the CTOT1. *Note: depending if the ADEP is inside or outside the IOP area, either the take-off time or respectively the entry time into the IOP area are impacted.*	S	FSMG.0021 FPGM.0004 ADMG.0009 ADMG.0010 FSMG.0002
3	The updated FO includes a target time over the entry point into the regulated location referencing as well the subject regulation (e.g. TTO1 Ref REG_A) to indicate the reason for the CTOT1.	S	FSMG.0119

Step	Operating Method	V&V	Requirement
4	NM makes the updated FO available to all Relevant IOP Units in the distribution list.	S	FSMG.0001 GENE.0001 SEQM.0006
5	At EOBT-1h, the flight is delayed by AO decision/reason. AO informs NM through a DLA message and as result NM issues an updated (revised) CTOT2 to AO (same REG_A). *Note: CTOTs updates can be: the result of received DLA, CHG or DPI messages; to notify a significant change or a change in the most penalising regulation (could also be an improvement), etc.*	S/O	ATFCM requirements
6	*Repeat steps 2 to 4 with CTOT2 instead of CTOT1*		*See step 2 to step 4*
7	At EOBT-45min, the regulation (REG_A) is cancelled. NM informs AO that itsCTOT2 is cancelled.	S/O	ATFCM requirements
8	NM reassesses constraints and updates the corresponding FO reflecting the removal of the CTOT2.		FSMG.0021 FSMG.0002 ADMG.0009 ADMG.0010
9	NM makes the updated FO available to all Relevant IOP Units in the distribution list.	S	FSMG.0001 GENE.0001 SEQM.0006 FPGM.0004

Table 121: Impact of CTOT

C.2.6 UC#1206: Updates of Trajectory based on CDM airports messages (DPI)

This use case describes the A-CDM messages impact on the existing FO. There are

Actors

- NM – the first IOP Unit in the control sequence.
- AO – Aircraft Operator providing the FPLs.
- IOP ANSPs – ANSPs that are IOP enabled.

Preconditions and Assumptions

1. The flight is before departure and its FPL is valid.
2. The flight is regulated and has a 30 min delay CTOT = 30min+EOBT+TaxiTime
3. The flight departs from ADEP that is a CDM Airport.

4. The corresponding FO has already been created and published by NM (the clock is after EOBT-2).
5. A-CDM Airport provides NM with DPI messages.

Operational Activity Description

Step	Operating Method	V&V	Requirement
1	At EOBT-2h NM creates and distributes the FO to the IOP ANSPs. *Note: The FO reflects the impact of the CTOT =10:30.* *Note: depending if the ADEP is inside or outside the IOP area, either the take-off time or respectively the entry time into the IOP area are impacted.*	S	GENE.0001 GENE.0003 FPMG.0001 FSMG.0021 FSMG.0001 FPMG.0004 ADMG.0009 ADMG.0010
2	ADEP provides NM with the T-DPI-t indicating the TTOT (Target take-off time) at 10:10. Based on this information, NM successfully improves the CTOT – new CTOT is 10:20. NM updates the FO to reflect the impact of the new CTOT. *Note: depending if the ADEP is inside or outside the IOP area, either the take-off time or respectively the entry time into the IOP area are impacted.*	O S	ETFMS and A-CDM Specifications FPMG.0006 GENE.0012 FSMG.0021 FSMG.0001 FPMG.0004 ADMG.0009 ADMG.0010 SEQM.0006
3	ADEP provides T-DPI-s indicating the TTOT at 10:15. NM updates the FO to reflect the impact of the latest TTOT (received in the T-DPI-s) and distributes the FO to all the IOP ANSPs. *Note: If at that time NM is not the responsible entity for updating the FO then it will request the actual RE the corresponding FO update.*	O S	ETFMS and A-CDM Specifications FPMG.0006 GENE.0012 FSMG.0001 ADMG.0009 ADMG.0010 SEQM.0006

Step	Operating Method	V&V	Requirement
4	ADEP provides A-DPI indicating the AOBT and a corresponding reliable TTOT of 10:18. NM updates the FO to reflect the impact of the latest TTOT, and distributes the FO to all the IOP ANSPs. *Note: If at that time NM is not the responsible entity for updating the FO then it will request the actual RE the corresponding FO update.*	O S	ETFMS and A-CDM Specifications FPMG.0006 GENE.0012 FSMG.0001 ADMG.0009 ADMG.0010 SEQM.0006

Table 122: Update of trajectory after DPI

C.2.7 UC#1207: Constraint application update (with NM)

This use case describes the provision of the FO updates by NM to all relevant IOP units, updates resulting from changes in the constraint activation status, based on the input from an IOP Unit or NM information.

With the IOP solution, the distribution of the initial flight plan performed by NM is performed with the creation and distribution of the Flight Object. In the future this will replace the current implementation of sending IFPL message for initial flight plan for IOP enabled Units.

Actors

- NM – the first IOP Unit to become aware of the flight plan data information.
- Unit-A– a non-IOP Unit that is controlling the flight before entering the IOP Area.
- Unit-B and Unit-C - Relevant IOP Units– the IOP Unit who's Area of Responsibility is traversed by the flight's trajectory.

Preconditions

1. The FO has already been created and shared by NM based on filed flight plan information from the AO (FPL or eFPL);
2. UA2022 is a restriction based on Letter of Agreement between 2 sectors of the Unit-A (flights to be transferred at FL290 or below);
3. UB1011 is a restriction based on Letter of Agreement between Unit-B and Unit-C (flights landing in Unit-C to be transferred at FL270 or below);
4. The flight is subject to both restrictions that are reflected as constraints in the FO;
5. The flight is not yet under the control of an IOP Unit;
6. The Unit-A provides NM with activation status updates of the UA2022 (via NM B2B service);
7. Both UA2022 and UB1011 are active.

Assumptions

1. The UB1011 is a strategic constraint and is shared between the concerned IOP units with NM. Same identifier of the constraint apply in both system.

There are 2 sub-UC that are further detailed below:

- Sub-UC1 – Constraint activation status update via NM B2B service
- Sub-UC2 – Constraint activation status update via FO

Operational Activity Description

Sub-UC1 – Constraint activation status update via NM B2B service

Step	Operating Method	V&V	Requirement
1	The flight is before departure and NM is the IOP Unit responsible for the update of the FO	O	
2	The traffic levels in Unit-A permits lifting the restriction imposed by the LoA inside the Unit A (UA2022)		
3	As Unit-A is eligible to modify the activation status of the UA2022, it sets the constraint as 'inactive' into their system and informs NM via B2B of the change. *Note: the system communicating to NM is the one used by the local flow managers.*	S	IFPS and NM B2B Specs
4	NM reassesses constraints and updates the FO reflecting the impact of removing the UA2022 (e.g. new entry time in the Unit B).	S	FSMG.0070
5	The predicted IOP trajectory is re-computed in order to satisfy the deactivated constraint.	S	FSMG.0002
6	NM makes the updated FO available to all IOP Units in the distribution list.		FSMG.0001 GENE.0001 SEQM.0006

Table 123: Constraint application udpate

Sub-UC2 – Constraint activation status update via FO

Step	Operating Method	V&V	Requirement
1	The flight is before departure and NM is the IOP Unit responsible for the update of the FO	O	
2	The operational situation (traffic levels) permits lifting the restriction imposed by the LoA between Unit-B and Unit-C (UB1011)	O	

Step	Operating Method	V&V	Requirement
3	As Unit-B in SAP, is eligible to modify the activation status of the UB1011 published constraint through IOP mechanisms, it sets the constraint as 'inactive' into the system. *Note 1: the traffic levels permits flights landing in Unit-C to be accepted above FL270)* *Note 2: it is expected that these actions, being normally performed by the FMP, could also be provided to NM thanks to B2B services even if the Unit is already in SAP, which corresponds to the first Sub UC, but either because the B2B service is not available or because the activation/deactivation is performed by an ATCO, Sub-UC2 may be useful.*	S	FSMG.0070 Or FMP functionality with NM B2B services.
4	NM reassesses constraints and updates the FO reflecting the impact of removing the UB1011. While re-computing the trajectory based on this new inactive constraint, NM detects a change should be applied to the Estimated Flight Level at the boundary between Unit-B and Unit-C (e.g. new FL = FL290).	S	FPMG.0006 FSMG.0070
5	The predicted IOP trajectory is re-computed in order to satisfy the deactivated constraint.	S	FSMG.0002
6	NM makes the updated FO available to all IOP Units in the distribution list. *Note: NM will not update the C&T data of the FO.*		FSMG.0001 GENE.0001 SEQM.0006
7	The Unit-B and Unit-C will reassess/update the C&T data to reflect the removal of the UB1011.	S	GENE.0004

Table 124: Constraint application status

C.2.8 UC#1209: Transfer of FO management responsibility to the first IOP-ANSP

This use case describes the process through which the FO management role is takeover from NM by the first IOP Unit.

Principles:

The first IOP Unit will take over the FO management role when operationally appropriate, i.e. when the responsibility for the flight shifts to ATC and the flight crew. The operational processes will ensure that the FO management role handover is always done when it makes sense operationally.

Even after FO management role handover to the first IOP Unit, NM and the AU through NM will have the possibility to update the flight plan and the FO if needed, by sending FDC requests for FO updating.

Two sub-use cases are detailed:

1. The role take over happens before the flight departure – the departure airport is in the AoR of the first IOP Unit;
2. The role take over happens after the flight departure – the departure airport is outside the IOP Area.

Actors

- NM – the first IOP Unit to become aware of the flight plan data information.
- AO – Aircraft Operator providing the FPL data. (*Note: the flight plan data can be either in the form of an FPL or eFPL*).
- Unit A – is the first IOP Unit to control the flight.

Preconditions

- The FPL was submitted and is valid (see UC#1201).
- The corresponding FO has been created and shared by NM (see UC#1201).

  Note: If the flight data is submitted in the form of preliminary flight plan (PFP) then the Use Case is not applicable as the FO is not created.

- Unit A enters SAP at EOBT-2h (for sub-use case 1)

Assumptions

- The flight is subject to an ATFM regulation (a CTOT is allocated and shared - see UC#1205)

Operational Activity Description

Sub Use Case 1 – role takeover before the flight departure

Step	Operating Method	V&V	Requirement
1	The flight crew establishes voice communication with the Unit A ATCO – requesting departure clearance. *Note: It is expected that this takes place at a time when the pilot is confident that CTOT is not going to change significantly (neither due to company nor flow management reasons) – e.g. CTOT-30 min*	O	
2	The ATCO in the Unit A assumes (force-assumes) the flight, and delivers the departure clearance.	O	COTR.0055
3	Unit A shares updated Flight Object information, including information regarding the RE controlling the flight.	S	GENE.0001 SEQM.0097 FPMG.0003 SEQM.0011
4	NM retains the ability to contribute to flight data updates based on ATFM messages and/or NM system reassessments.	S	FSMG.0085

Table 125: FDMP role takeover before departure

Sub Use Case 2 - role takeover after the flight departure

Step	Operating Method	V&V	Requirement
1	When the flight is at a certain time (local parameter) before the entry into Unit A AoR, the Unit A determines it is entitle to take over the management role of the FO. *Note: the latest this happens when the pilot contacts the ATCO of the Unit A.*	S	COTR.0055
2	Unit A shares updated Flight Object information, including information regarding the RE controlling the flight.	S	GENE.0001 SEQM.0097 FPMG.0003 SEQM.0011
3	NM retains the ability to contribute to flight data updates based on ATFM messages and/or NM system reassessments.	S	FSMG.0085

Table 126: Role takeover after departure

C.3 ATC-NM IOP requirements

The requirements listed below correspond to what is needed once NM is integrated in the IOP network.

INTEROP CHAPTERS								
REQUIREMENTS FOR INTEROPERABILITY	M	Network Manager Integration in IOP						

IMPLEMENTATION RULE		BASIC IOP REQUIREMENTS	
		M	FPMG.0001-Flight Object creation conditions (by NM)
		M	FPMG.0002-Source/Originator of the flight plan data
		M	FPMG.0003-Flight Object sharing to NM
		M	FPMG.0006-NM Update based on non-IOP units input
		M	FPMG.0007-Suspension status of Flight plan
		M	FSMG.0085-NM Addition of Constraints
		M	FPMG.0004-Sharing of flight management regulations
		M	FPMG.0005-Flight cancellation notification
		M	FSMG.0119-Sharing of the Regulation Reason

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FPMG.0001
Title	Flight Object creation conditions (by NM)
Requirement	Flight Object **shall** be created whenever the following conditions are fulfilled: • Flight is planned to cross the IOP Area, and • Flight plan data is 'operationally valid' (acceptable), and • A parameter time before EOBT or before the entry into the IOP Area has elapsed, and • Flight Object doesn't exist for the same flight plan data. Note: 'Operationally valid' represents flight plan data with the planning status of CONCUR or NEGOTIATE (for preliminary flight plan (FF-ICE)), or Filing status of ACCEPTABLE (for eFPL).
Status	<In Progress>
Rationale	Not all flights will be required to be managed through the use of the shared flight data as not all flights will cross the IOP Area. This will avoid creation of shared flight data that nobody will use. When creating the FO, NM will include the calculated take off times (CTOT), target times (TTs – arrivals (TTA) and/or over (TTO)) resulting from the active flow constraints and all strategic constraints (LoAs, etc.) NM is aware of. This information should be provided via the FO allowing other systems using the FO to take them into account when calculating their local trajectory (especially the CTOT should certainly be considered for flights before departure). Furthermore, such information is likely to raise local FMPs and ATCOs awareness on the constrained flights.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FPMG.0002
Title	Source/Originator of the flight plan data

Requirement	The identification of the source and the originator of the corresponding flight plan data **shall** be shared.
Status	<In Progress>
Rationale	Some shared flight data will be created based on the eFPL and other on the FPL (during transition to FF-ICE/1).
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FPMG.0003
Title	Flight Object sharing to NM
Requirement	The Network Manager **shall** be added in the distribution list for any flight object.
Status	<In Progress>
Rationale	The Network Manager has to be provided with all the flight data updates for all the flights that are planned to traverse European airspace. It reflects existing practice in the new means of exchanging flight data.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FPMG.0006
Title	NM Update based on non-IOP units input
Requirement	NM **shall** be able to update shared flight data according to the data provided to that IOP Unit by non-IOP units involved in the flight management
Status	<In Progress>
Rationale	NM is expected to share all the information available at a certain moment in order to keep the shared data updated for all the other units involved in the flight management. The subject information may come from non-IOP Units as well, AFTN or NM specific messages etc.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FPMG.0007
Title	Suspension status of Flight plan
Requirement	NM **shall** share the suspension status of a flight including the suspension reason and related information to all IOP Units concerned
Status	<In Progress>
Rationale	The suspension status of a flight needs to be shared to raise concerned controller(s) awareness with respect to that flight's situation. The change in the status of a flight needs to be shared to raise concerned controller(s) awareness with respect to that flight's situation.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FSMG.0085
Title	NM Addition of Constraints
Requirement	The Network Manager **shall** add to the Flight Script of a flight any strategic or planning constraint applicable to this flight.
Status	<In Progress>
Rationale	NM requirements will be included in the shared information
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FPMG.0004
Title	Sharing of flight management regulations
Requirement	An IOP Unit **shall** share the CTOT.
Status	<In Progress>
Rationale	The CTOT must be shared. *Note: The CTOT is the Calculated Take –Off Time issued by NM for flights subject to flow management regulations*
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution

<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FPMG.0005
Title	Flight cancellation notification
Requirement	The flight's cancellation information **shall** be shared.
Status	<In Progress>
Rationale	The shared flight information will contain flight cancelation information. The flight cancelation information should not result in the deletion of the FO and it can be removed in cases when the cancel-refile procedure is used by the AOs. Any Unit involved in the flight management is expected to share all the information available at a certain moment in order to keep the shared data updated for all the other units involved in the flight management.
Category	<IER><Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-18-02b1-SPRINTEROP-FSMG.0119
Title	Sharing of the Regulation Reason
Requirement	An IOP Unit **shall** include the reason for the shared CTOT by referencing the corresponding regulation
Status	<In Progress>
Rationale	The regulation is the source of the shared CTOT (time constraint).
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b1
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Appendix D AIM Distribution (Solution 18-02b1)

D.1 Introduction

In order to ensure that all IOP Units are able to use consistent information with regard to environment data used in the management of the IOP trajectory and the Flight Script, it is important that each system has access to a common source from which it can derive the local environment data base.

The following sections provide requirements on a common service and describe a process through which this data can be managed within each AIRAC cycle.

D.2 Actors

- ANSP 1 & 2, team in charge of AIM data
- ANSP 1& 2, teams in charge of integration, verification and validation (IVV team)
- EAD team
- CACD team

D.3 Preconditions

2. All AIP Data for a future AIRAC cycle has been prepared at ANSP's 1 and 2. They can be sent for publication to EAD.

D.4 Assumptions

ANSP's 1 and 2 are IOP enabled. We are preparing AIRAC cycle 2008.

The date marked "D" is the AIRAC day for AIRAC 2008, in that case 16th July 2020.

D.5 Operational Activity Description

The operating method is described below (see also ***D.7***):

Step	Operating Method		V&V	Requirement
	Time period	Description		
1	< D-49	At ANSP's 1 and 2, AIP data corresponding to AIRAC 2008 are sent to EAD,	N	AIMS.0001 AIMS.0002
2	< D- 45	EAD checks the data and sends it to CACD	N	
3	[D-45 D-28]	Check of all EAD data against AIP and with National ENV Coordinators	N	
4	< D-28	CACD test data made available to all IOP partners	N	AIMS.0003
5	[D-28 D-21]	Each IOP ANSP tests the CACD data and sends feedback to CACD if needed	N	
6	[D-21- D-15]	Based on feedback received, CACD sends an update data set when needed	N	

Step	Operating Method		V&V	Requirement
	Time period	Description		
7	[D-15 D-12]	Relevant IOP partners organize transversal IOP testing and provide feedback to CACD	N	AIMS.0004
8	D-10	CACD provides final data set	N	AIMS.0005
9	D-6	GO/NOGO decision on the data set	N	
19	[D-5 D-3]	Data set installation at all sites	N	~~AIMS.0001~~

Table 127: Timing of AIM data preparation

D.6 Associated OPS requirements.

The following information shall be shared within the agreed scope respective to each data category by all IOP partners from data provided by NM:

D.6.1 Geographical scope

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0001
Title	Sharing of IOP expansion area definition
Requirement	All IOP Partners shall commonly define an area, the IOP Expansion area, within which all IOP partners shall be able to compute a trajectory , encompassing at least the IOP area.
Rationale	This area will be agreed among partners and does not need to be distributed as AIM data.

D.6.2 Aerodromes

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0002
Title	Geographical scope of information shared for aerodromes
Requirement	All aerodromes contained in the IOP expansion area must be shared, as well as an agreed set of aerodromes considered to be in the vicinity of the IOP expansion area.
Rationale	…

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0003
Title	Content of information shared for aerodromes

Requirement	The information shared on aerodromes shall include the following data:

Subject	Property	Sub-Property	Description	Modelling Reference	EAIMS Data Breakdov	Decision for IOP	Minimum Geographical Coverage
Aerodrome/Heliport						!	
Aerodrom			A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft/helicopters.			!	
	Designator		Designator of the aerodrome/heliport.			!	
		Location Indicator ICAO	The four letter ICAO location indicator of the aerodrome/heliport, as listed in ICAO DOC 7910.	AIXM 5.1 Core	AIS	YES	World Wide
	Name		The primary official name of an aerodrome as designated by an appropriate authority.	AIXM 5.1 Core	AIS	YES	World Wide
	Type of Traffic Permitted		Type of traffic permitted to use the aerodrome/heliport.			!	
		International/National	Indication if international and/or national flights are permitted at the aerodrome/heliport.	AIXM 5.1 Core	AIS	YES	NM Area+ ECAC+
		IFR/VFR	Indication if IFR and/or VFR flights are permitted at the aerodrome/heliport.	AIXM 5.1 Core	AIS	YES	NM Area+ ECAC+
		Scheduled/Non-Scheduled	Indication if scheduled and/or nonscheduled flights are permitted at the aerodrome/heliport.	AIXM 5.1 Core	AIS	YES	NM Area+ ECAC+
		Civil/Military	Indication if civil commercial aviation and/or general aviation and/or mil. flights are	AIXM 5.1 Core	AIS	YES	NM Area+ ECAC+
		Restricted Use	Indication if an aerodrome or heliport not open for the public (Only for the use of the owners).	AIXM 5.1 Core	AIS	YES	NM Area+ ECAC+
	Field Elevation		The vertical distance above Mean Sea Level (MSL) of the highest point of the landing area.			!	
		Elevation	The value of the aerodrome elevation. The vertical distance to the highest point on the landing area of the aerodrome from Mean Sea Level.	AIXM 5.1 Core	AIS	YES	NM Area+ ECAC+
	Aerodrome Reference Point (ARP)		The designated geographic location of an aerodrome as established by the appropriate authority. (The aerodrome reference point shall be located near the initial or planned geometric centre of the aerodrome and shall normally remain where first established.)			!	
		Position	A geographic position of the Aerodrome/Heliport reference point. The aerodrome reference point shall be located near the initial or planned geometric centre of the aerodrome.	AIXM 5.1 Core	AIS	YES	World Wide
	DCT Limitations		The maximum allowed length of a DCT segment between the departure Aerodrome and the first point of the Route, or between the last point of the Route and the arrival AD.	None	ATFCM	YES	NM Area
	Standard Taxi Time		Standard taxi-time for departure of an Aerodrome.	None	ATFCM	YES	NM Area
Runway						!	
Run			A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft. (Annex 14).			!	
	Designator		The full textual designator of the runway, used to uniquely identify it at an aerodrome/heliport which has more than one. E.g. 09/27, 02R/20L, RWY.	AIXM 5.1 Core	AIS	YES	World Wide
Ru			One of the two landing and take-off directions of a runway for which attributes			!	
	Designator		The full textual designator of the landing and take-off direction. Examples: 27, 35L,	AIXM 5.1 Core	AIS	YES	World Wide
	True Bearing		The measured angle between the runway direction and True North at a given	AIXM 5.1 Core	AIS	YES	ECAC
	Default RWY		One of "Arrival", "Departure", "Default", "None".	None	ATFCM	YES	NM Area
	Threshold		The runway thresholds are markings across the runway that denote the beginning and end of the designated space for landing and takeoff under non-			!	
		Position	Geographical coordinates for each threshold and runway.	AIXM 5.1 Core	AIS	YES	ECAC+EWD
		Elevation	Elevation of the runway threshold.	AIXM 5.1 Core	AIS	YES	ECAC+EWD
RunwayUsage			A Runway Usage must be defined for each Runway Direction.			!	
	Default Taxi Time		The average elapsed time in minutes for a departing aircraft to taxi from the off-block	None			NM Area

Rationale	

D.6.3 Distant aerodromes

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0004
Title	Sharing of information for distant aerodromes
Requirement	All IOP partners shall share the definition of the rest of the world regions position, for use by the trajectory computation algorithm for inbound flights.
Rationale	All partners must share a common definition by grouping airports by area with a granularity related to the distance from the IOP area.

D.6.4 Airspace

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0005
Title	AOR and AOI definition sharing
Requirement	All IOP partners shall share the definition the airspace of the Area of Responsibility and the Area of Interest for all IOP partners.
Rationale	All IOP partners must be able to compute the list of crossed AOR's and list of crossed AOI's.

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0006
Title	Content of information shared for airspace
Requirement	For all common airspace volumes, the following data shall be shared: • Designation • Lateral limits • Vertical limits • Airspace composition • ATS Unit name
Rationale	All IOP partners must be able to compute the list of crossed AOR's and list of crossed AOI's

D.6.5 Route

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0007
Title	Geographical scope of information shared for airways
Requirement	All airways crossing the IOP expansion area must be shared among partners.
Rationale	Any airway crossing this area might be referenced in a flight plan.

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0008
Title	Content of information shared for airways
Requirement	The following information shall be shared in relation to airways:

Subje	Property	Sub-Proper	Description	Modelling Reference	EAIMS Data Breakdown	Decision for IOP	Minimum Geographical Coverage
Route						!	
ATS Route			A specified ATS route designed for channelling the flow of traffic as necessary for the provision of air traffic services, from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.			!	
	Designator		Designators for ATS routes according to Annex 11 Appendix 1 (or Appendix 3 for standard departure and arrival routes).	AIXM 5.1	AIS	YES	World Wide
	Designator Prefix		A prefix for the route designator (upper, Helicopter, etc.).	AIXM	AIS	YES	World Wide
Military Route			A specified MIL route designed for channelling the flow of traffic as necessary for the provision of air traffic services, from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.			!	
	Designator		Designators for MIL routes.	AIXM 5.1 Core	AIS	YES	World Wide
Route Segment			A portion of a route to be flown usually without an intermediate stop, as defined by two consecutive significant points.			!	
	From Point		Reference to the first point of a route segment.			!	
		Name	The coded designators or name-codes of significant point.	AIXM 5.1 Core	AIS	YES	World Wide
	To Point		Reference to the second point of a route segment.			!	
		Name	The coded designators or name-codes of significant point.	AIXM 5.1 Core	AIS	YES	World Wide
	Upper Limit		The Upper Limit of the route segment. The vertical position of the route segment ceiling.	AIXM 5.1 Core + ADR Extension	AIS	YES	NM Area+ ECAC+
	Lower Limit		The Lower Limit of the route segment. The vertical position of the route segment floor.	AIXM 5.1 Core + ADR Extension	AIS	YES	NM Area+ ECAC+
	Direction of Cruise Level		Indication on the direction of the cruising level (even, odd, NIL).			!	
		Forward	Indication on the direction of the cruising level (even, odd, NIL) from first point to second point of route segment.	AIXM 5.1 Core	AIS	YES	ECAC
		Backward	Indication on the direction of the cruising level (even, odd, NIL) from second point to first point of route segment.	AIXM 5.1 Core	AIS	YES	ECAC
	Controlling Unit		A generic term meaning variously all types of 'units' providing all types of services. This includes particularly Air Traffic Management/Control (ATM/ATC) Units.			!	
	Route Availability		The availability status of the Route/Route Segment (direction, cardinal direction, status, levels, including CDRs).	AIXM 5.1	AIS	X	World Wide

Rationale	

D.6.6 Arrival and Departure Procedures

A subset of information may be shared as AIM data concerning arrival and departure procedures. However, there is no requirement on the scope of these data as we can consider it is sufficient to rely on the information provided by the IOP partner in charge of the airport.

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0009
Title	Content of information shared for arrival and departure procedures
Requirement	For the agreed arrival and departure procedures, the following information shall be shared among IOP partners:

Subject	Property	Sub-Property	Description	Modelling Reference	EAIMS Data Breakdown	Decision for IOP	Minimum Geographical Coverage
Instrument Flight Procedure						!	
Procedure			A series of predetermined manoeuvres with specified protection from obstacles.			!	
	Identification		Procedure identification.			!	
		Runway	The runway designator of the landing and take-off direction. Examples: 27, 35L, 01R.	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
		Circling	Indication if a procedure is/ is not a circling approach.	AIXM 5.1	AIS	YES	NM Area+ECAC
		Name	Name of the instrument flight procedure.	AIXM 5.1	AIS	YES	NM Area+ECAC
	Plain Language Designation		Procedure plain language designation.			!	
		Basic Indicator	The basic indicator shall be the name or name-code of the significvant point where the standard deparutre route terminates.	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
	Coded Designation		Procedure indicators and designators.			!	
		Significant Point	The coded designator or name-code of the significant point.	AIXM 5.1	AIS	YES	NM Area+ECAC
		Validity Indicator	The Validity Indicator of the procedure.	AIXM 5.1	AIS	YES	NM Area+ECAC
		Route Indicator	The Route Indicator of the procedure.	AIXM 5.1	AIS	YES	NM Area+ECAC
	Procedure Type		Indication of the type of procedure (departure, arrival, approach, other).	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
	Aircraft Category		Indication of which aircraft categories the procedure is intended for.	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
	Procedure Transition		A group of consecutive segments that are part of a branch on an approach procedure, SID or STAR.			!	
		Type	The type of transition.	AIXM 5.1	AIS	YES	NM Area+ECAC
	PBN Requirements		Specific requirements related to a PBN procedure.			!	
		Identification	Identification of the navigation specification (RNAV 5, PBN 0.3 ...).	AIXM 5.1 Core	AIS	YES	ECAC
		Navigation Specification	Any navigation sensor limitations (GNSS required ...).	AIXM 5.1 Core	AIS	YES	ECAC
Procedure Segment						!	
Procedure Segment			A portion of a procedure as defined by two consecutive significant points (significant point - selection between a navaid system, a runway point, an airport reference point, an aiming point or a fix designated point).			!	
	Start Point		Identification of the start point of the segment.	AIXM 5.1	AIS	YES	NM Area+ECAC
	End Point		Identification of the end point or a description of the end of the segment.	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
	End Fix Role		Indication of the role of the end fix (MAPt, IF, IAF, FAF, MAHF, etc.).	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
	Procedure Altitude/Height		A specified altitude/height flown operationally a tor above the minimum altitude/height and established to accommodate a stabilized descent ata prescribed descent gradient/angle in the intermediate/final approach segment.	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
	Speed		Speed limit at a significant point, expressed in units of 10 knots applicable.	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
Missed Approach Segment			A type of Segment designed in accordance with the rules for missed approach segments having the properties specific to a missed approach segment.. The missed approach segment begins at DA and ends at the clearance limit.			!	
	Approach		(ICAO) A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable , from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.	AIXM 5.1 Core	AIS	YES	NM Area+ECAC
Procedure Holding						!	
Procedure Holding			A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.			!	
	Identification		Identification of the holding procedure.	AIXM 5.1 Core	AIS	YES	ECAC
	Fix		Geographical location that serves as a reference for a holding procedure.	AIXM 5.1 Core	AIS	YES	ECAC
	Inbound Course		Inbound true course.	AIXM 5.1 Core	AIS	YES	ECAC
	Outbound Course		Outbound true course.	AIXM 5.1 Core	AIS	YES	ECAC
	Leg Time		Outbound time of the leg.	AIXM 5.1 Core	AIS	YES	ECAC
	Turn Direction		Direction of the turn (LEFT, RIGHT, etc.)	AIXM 5.1 Core	AIS	YES	ECAC
	Minimum Altitude		Minimum holding level to the nearest higher 50 m or 100 ft/flight level.	AIXM 5.1 Core	AIS	YES	ECAC
	Maximum Altitude		Maximum holding level to the nearest higher 50 m or 100 ft/flight level.	AIXM 5.1 Core	AIS	YES	ECAC

Rationale	Any airway crossing this area might be referenced in a flight plan

D.6.7 Navaids and GEO objects

<table>
<tr><td>Identifier</td><td>REQ-18-02b-SPRINTEROP-AIMS.0010</td></tr>
<tr><td>Title</td><td>Geographical scope of information shared for Navaids and GEO objects</td></tr>
<tr><td>Requirement</td><td>All Navaids and GEO objects contained in the IOP expansion area as the ones corresponding to the first point outside the IOP expansion area on routes crossing this area shall be shared among partners.</td></tr>
<tr><td>Rationale</td><td>IOP partners must be able to compute a trajectory spanning the IOP expansion area which implies knowing the first point outside it on any route.</td></tr>
</table>

<table>
<tr><td>Identifier</td><td>REQ-18-02b-SPRINTEROP-AIMS.0011</td></tr>
<tr><td>Title</td><td>Content of information shared for Navaids</td></tr>
<tr><td>Requirement</td><td>The following information shall be shared about Navaids:
<table>
<tr><th>Subje</th><th>Property</th><th>Sub-Property</th><th>Description</th><th>Modelling Reference</th><th>EAIMS Data Breakdow</th><th>Decision for IOP</th></tr>
<tr><td colspan="2">Radio Navigation Aid</td><td></td><td></td><td></td><td></td><td>!</td></tr>
<tr><td colspan="3">Radio Navigation Aid</td><td>A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids (VOR, DME, ILS_DME, MLS_DME, SDF, etc.).</td><td></td><td></td><td>!</td></tr>
<tr><td></td><td>Type</td><td></td><td>Type of Radio Navigation Aid.</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
<tr><td></td><td>Identification</td><td></td><td>The identifying code given to the navaid.</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
<tr><td></td><td>Name</td><td></td><td>The long name given to the navaid.</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
<tr><td></td><td colspan="2">Magnetic Variation</td><td>The angular difference between True North and Magnetic North measured at a given position and date.</td><td></td><td></td><td>!</td></tr>
<tr><td></td><td>Position</td><td></td><td>Geographical location of the radio navigation aid.</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
</table></td></tr>
<tr><td>Rationale</td><td>IOP partners must be able to compute a trajectory spanning the IOP expansion area which implies knowing the first point outside it on any route.</td></tr>
</table>

<table>
<tr><td>Identifier</td><td>REQ-18-02b-SPRINTEROP-AIMS.0012</td></tr>
<tr><td>Title</td><td>Content of information shared for GEO Objects</td></tr>
<tr><td>Requirement</td><td>The following information shall be shared about GEO Objects:
<table>
<tr><th>Subje</th><th>Property</th><th>Sub-Proper</th><th>Description</th><th>Modelling Reference</th><th>EAIMS Data Breakdow</th><th>Decision for IOP</th></tr>
<tr><td colspan="2">Waypoint/Procedure Point</td><td></td><td></td><td></td><td></td><td>!</td></tr>
<tr><td colspan="3">Designated Point</td><td>A geographical location not marked by the site of a radio navigation aid, used in defining an ATS route, the flight path of an aircraft or for other navigation or ATS purposes.</td><td></td><td></td><td>!</td></tr>
<tr><td></td><td>Type</td><td></td><td>Waypoint (a point used for RNAV procedures/routes), Oceanic Entry/Exit (the Oceanic entry/exit attribute indicates whether the Significant Point is an oceanic entry point. The purpose of this attribute is to enable IFPS to recognise whether a point in a FPL is an oceanic entry point. Only ICAO Significant Points (Waypoint, Navigation Aid, Reference Point, and Geo Point) shall be defined as oceanic entry points.), Other.</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
<tr><td></td><td>Name</td><td></td><td>Names, coded designators or name-codes of significant waypoint.</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
<tr><td></td><td>Identification</td><td></td><td>The coded designator of the point. For example, the five-letter ICAO name of the point, etc..</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
<tr><td></td><td>Location</td><td></td><td>The geographical location of the waypoint.</td><td>AIXM 5.1 Core</td><td>AIS</td><td>YES</td></tr>
</table></td></tr>
<tr><td>Rationale</td><td>IOP partners must be able to compute a trajectory spanning the IOP expansion area which implies knowing the first point outside it on any route.</td></tr>
</table>

D.6.8 AIM data preparation process

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0013
Titles	Initial transmission of AIM data to NM
Requirement	All IOP Partners shall send the basic AIM data related to aerodromes, airspace, route, procedures, navaids and GEO objects at least 49 days before the AIRAC date.
Rationale	In order to get NM feedback at D-28 this is required

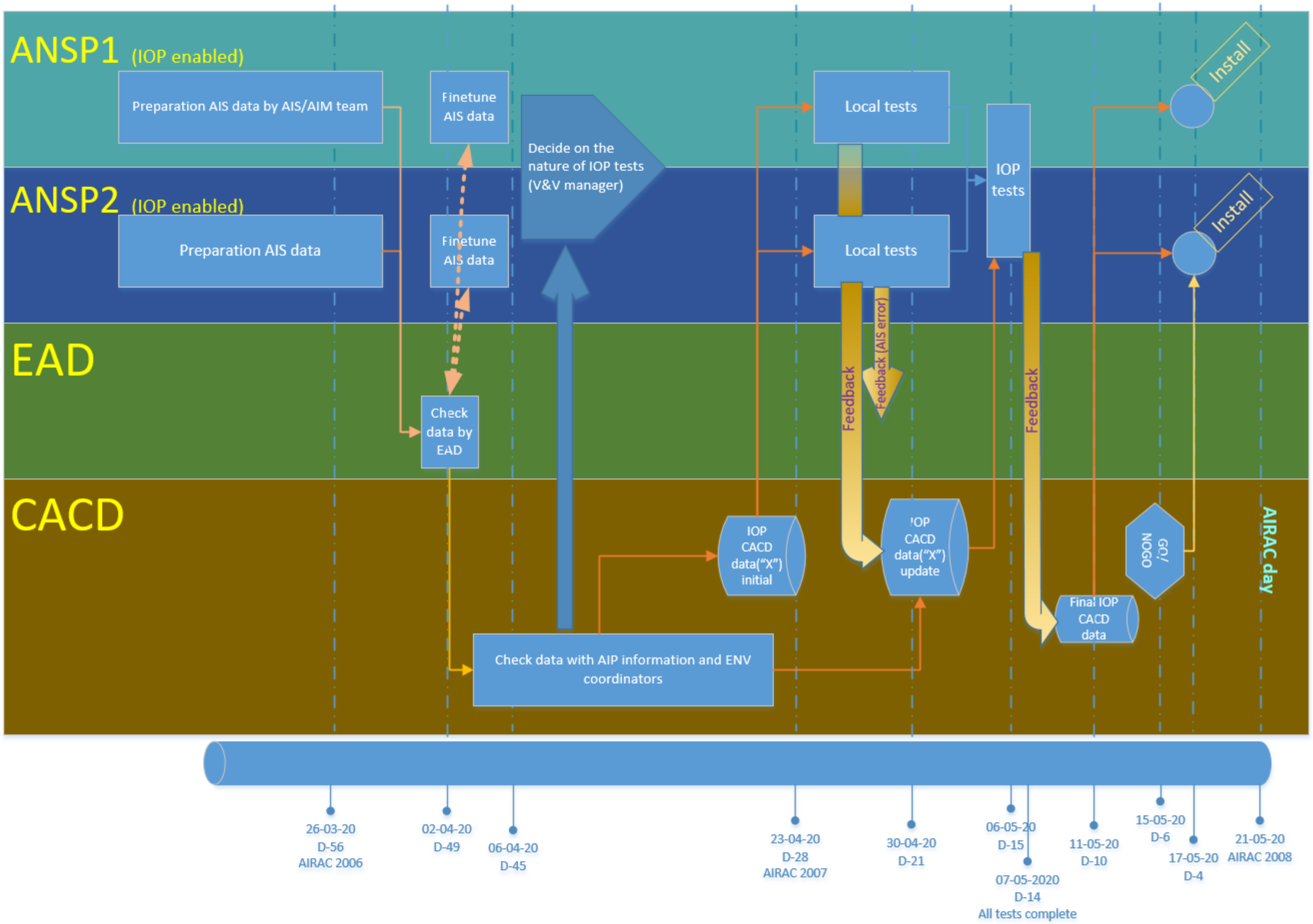
Identifier	REQ-18-02b-SPRINTEROP-AIMS.0014
Titles	Provision of AIM test tape by NM
Requirement	Provided all the data for IOP partners have been received before D-49, NM shall provide an initial set of IOP CACD data to IOP partners at D-28.
Rationale	

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0015
Title	AIM common IOP testing
Requirement	Based on specialists assessment, when deemed necessary, the IOP partners shall organize common IOP testing with the new AIRAC data at least 15 days before the AIRAC day.
Rationale	

Identifier	REQ-18-02b-SPRINTEROP-AIMS.0016
Titles	Distribution of final AIRAC data
Requirement	NM shall provide the final AIRAC data to all IOP partners at least 10 days before AIRAC day.
Rationale	

D.7 Overview of AIM data preparation and distribution process distribution process

The following diagram provides a time sequence of the steps to prepare the AIM data, taking as example the activities before AIRAC 2008



Appendix E Future work

E.1 Future Use Cases

UC#	Title	Main thread described
UC#0116	Undo-Assume/Reclaim	
UC#0121	Release by upstream, downstream and release request	
UC#0132	Route negotiation	
UC#0134	Cancellation of a Request on frequency	
UC#0135	Negotiation of Rate of Climb/Rate of Descent	
UC#0137	Undo Force-assume	
UC#0220	Gradient constraint management	
UC#0221	Management of time constraints CTA/CTO TTA/TTO CTOT	
UC#0229	Offset management	
UC#0238	Sharing of complex clearances (closed heading, offset...)	
UC#0241	Use of level constraint associated to a CFL	
UC#0242	Inclusion of Surface movements	
UC#0246	Sharing current cleared route	
UC#0507	External RE-Skip/Unskip (control goes to other Unit)	
UC#0508	Automatic IOP Unit delegation	
UC#0512	Release in delegation, before and modified during Delegation	
UC#0514	Automatic Skip of an IOP Unit in favour of the downstream	
UC#0515	Unskip of an IOP Unit skipped in favour of the downstream	
UC#0516	Manual Skip of an IOP Unit in favour of the downstream	

UC#	Title	Main thread described
UC#0517	Coordination data change in a SKIP	
UC#0806	Request to assign the IOP_DSSR	
UC#0901	Complex negotiations between more than 2 IOP Units	
UC#0902	Negotiation with a skipped Responsible Entity	
UC#0903	Negotiation with a Delegator (and Delegatee)	
UC#0904	Update of the negotiation	
UC#1301	Sharing of an EPP report	
UC#1302	Sharing discrepancy between the planned and airborne trajectory	

Table 128: Future Use Cases

E.1.1 Full IOP Requirements

This section presents the requirements related to Full interoperability. It has to be considered as an initial capability date which means that Basic IOP requirements will be still valid for Full IOP. If it eases the technical implementation, a requirement assigned to a later step of deployment may be implemented in an earlier step.

E.1.2 Coordination and Transfer

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0102
Title	Full IOP C&T Negotiable Data
Requirement	The following C&T Functional data **shall** be shared between The Transferring and Receiving REs • Offset value and direction (right/left) • Release as defined by requirement **Error! Reference source not found.**provided by the Transferring RE • Release as defined by requirement **Error! Reference source not found.**provided by the Receiving RE
Status	<In Progress>
Rationale	Transfer conditions may rely on any combination of the described data which supplement the one described in requirement REQ-18-02b-SPRINTEROP-COTR.0027.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX

<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0111
Title	Full IOP C&T Functional data
Requirement	The Reclaim as a C&T Functional data **shall** be shared between The Transferring and Receiving REs.
Status	<In Progress>
Rationale	Transfer conditions may rely on the Reclaim, in addition to the described data in requirement REQ-18-02b-SPRINTEROP-COTR.0110.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0127
Title	Acknowledgement of not agreed changes in CAP and NP
Requirement	In CAP and NP, should a non-agreed change be acknowledged, that acknowledgement **shall** be shared.
Status	<In Progress>
Rationale	It is useful for the RE who made a non-agreed change in NP to be informed that the coordination partner noticed the change. This information exchange should be extended to the CAP as some Units might decide to also highlight non-agreed changes in CAP.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0055
Title	Force-assume by any IOP Unit
Requirement	Any RE receiving the flight information (even not expected to control the flight) **shall** be able to force-assume a flight.
Status	<In Progress>
Rationale	An RE should be able to take full control of a flight when he's contacted by the flight crew, independently of any other system configuration (frequency change status or predefined control sequence).

Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Frequency change

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0038
Title	Undo-assume
Requirement	Receiving RE **shall** be able to perform an undo-Assume.
Status	<In progress>
Rationale	Assumption could be made by mistake and ATCO should then have a means to correct his error. It may only happen after a frequency change.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0039
Title	Undo-assume consequences
Requirement	After an undo-assume, the transfer of communication **shall** be set to 'initiated' and the coordination phase **shall** be the one before the assumption, unless next phase should have been triggered in the meantime.
Status	<In Progress>
Rationale	As the undo-assume functionality aims at correcting an error, it should reset the scene as it was before the wrong assumption.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Request on Frequency

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0105
Title	ROF cancellation
Requirement	The IOP Unit requesting the flight on frequency **shall** be able to cancel this request before the flight has been transferred to his frequency.
Status	<In Progress>
Rationale	The downstream IOP Unit may no longer need the aircraft urgently on his frequency.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Reclaim

The reclaim functionality offers, in full IOP scope, the ability for the upstream to request its downstream to get the flight back on its frequency after the assumption by the downstream.

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0045
Title	Reclaim
Requirement	The Transferring RE **shall** be able to request an aircraft on frequency (reclaim) to the Receiving RE only after the flight has been assumed by the Receiving RE.
Status	<In Progress>
Rationale	An ATCO who wrongly transfer on frequency a flight to his downstream (who already assumed it) should be able to ask him to get it back on frequency if needed.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0047
Title	End of reclaim availability
Requirement	The Transferring RE **shall** be able to reclaim a flight until the aircraft has left its AoR.
Status	<in Progress>
Rationale	It is not permitted to request to have back on frequency an aircraft which has already been transferred twice.

Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0049
Title	Reclaim end by transfer of frequency
Requirement	Frequency change from a Receiving RE to the Transferring RE **shall** terminate the Reclaim it has been addressed to.
Status	<In progress>
Rationale	Transferring the flight to the upstream frequency satisfies the reclaim request which should then be closed.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0185
Title	C&T data latency after FORCE-ASSUME
Requirement	The C&T data between the force-assumed sector and its downstream should be maintained until the stolen flag has been acknowledged.
Status	<In Progress>
Rationale	Should a flight be force assumed, the control sequence and related C&T data **shall** not be updated until the stolen flag is acknowledged (by the robbed RE).
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Release

The Release provided by an RE determines the degree of freedom offered by this RE to another RE in order to control the aircraft inside its AoR.

In Full IOP, the Release scope is expected to integrate additional qualifiers than “Release for Climb or Descent ” which restrict the Full Release according to the air traffic situation:

- Release for Turn, either Right or Left, with or without a maximum angle expressed in degrees,

- Release within a Corridor with a maximum distance from the planned trajectory expressed in NM,
- Release for Speed with or without a limit expressed either in knots or Mach,
- Release for Rate of Climb or Descent, with or without a maximum rate expressed in feet per minute,

The global package of Release qualifiers can be associated to one or more aircraft identifier(s) the release conditions are subject to.

A Release is defined for any RE controlling the flight outside its own airspace, whether it's:

- the Receiving RE in an anticipated frequency change,
- the Transferring RE in a late frequency change,
- the RE controlling the flight inside a skipped airspace,
- the Delegatee RE inside the Delegator's airspace.

The release functionality is a key element of the management of a flight in the airspace of another IOP Unit and will bring full benefits when implemented with the Skip and the Delegation functionalities.

The release status is displayed on the controller HMI in both REs. This could be graphical or textual. The information may also be input into controller tools, for example to highlight a clearance that would breach the release qualifier. The use of release information in controller tools is, however, a local implementation matter, and subject to validation.

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0066
Title	Release data in Full IOP
Requirement	It **shall** be possible to provide a Release containing one or more of the following data: • Release for turn in angle, • Release within a corridor, • Release for speed, • Release for rate of climb or descent. • One or more aircraft identifier(s) the release conditions are subject to.
Status	<In Progress>
Rationale	These data describe the needed parameters to offer a degree of freedom to the adjacent IOP Unit.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0067
Title	Release for turn
Requirement	Release for turn **shall** allow a direction limitation to the right and/or to the left with the additional possibility to limit the release to (a) specific angle(s) expressed in degrees.
Status	<In Progress>
Rationale	Description of a release for turn.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0113
Title	Release within a corridor
Requirement	Release within a corridor **shall** define a lateral distance to each side of the route in which the controller is allowed to clear the aircraft.
Status	<In Progress>
Rationale	This release is related to the route and not to the position of the aircraft.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0069
Title	Release for Speed
Requirement	Release for Speed **shall** allow a limitation expressed in knots or Mach maximum or minimum.
Status	<Validated>
Rationale	Description of a release for speed.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0070
Title	Release for rate
Requirement	Release for Rate **shall** allow a rate limitation (climb or descent) expressed in feet per minute maximum or minimum.
Status	<In Progress>
Rationale	Description of a release for rate
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0073
Title	Release request from Transferring
Requirement	Transferring IOP Unit **shall** be able to ask for a specific release item to the Receiving IOP Unit.
Status	<In Progress>
Rationale	To be able to manage a flight in someone else's airspace, release might be requested to the owner of the airspace.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0074
Title	Release request from Receiving
Requirement	Receiving IOP Unit **shall** be able to ask for a specific release item to the Transferring IOP Unit.
Status	<In Progress>
Rationale	Any release data should be negotiable.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0085
Title	Release request from Delegatee
Requirement	The Delegatee **shall** be able to ask for a specific release item to the Delegator.
Status	<In Progress>
Rationale	Any release data should be negotiable.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ18-02b
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0114
Title	Release modification by the Skippee
Requirement	The RE to which the skip was granted **shall** be able to modify the Release conditions provided by the skipped RE.
Status	<In Progress>
Rationale	It's a local IOP Unit responsibility not to violate the release conditions provided by the skipped RE.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0160
Title	Release for climb
Requirement	An IOP unit **shall** be able to provide a Release for climb.
Status	<In Progress>
Rationale	A Release for climb is provided when the RE providing it wants to define the possible climb clearances in its airspace.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0161
Title	Release for descent
Requirement	An IOP unit **shall** be able to provide a Release for descent.
Status	<In Progress>
Rationale	A Release for descent is provided when the RE providing it wants to define the possible descent clearances in its airspace.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0165
Title	Release for climb request
Requirement	An IOP unit **shall** be able to request a Release for climb from its coordination partner.
Status	<In Progress>
Rationale	In Basic IOP, the Receiving RE might need a release for climb from the Transferring RE to manage the flight after an early transfer. Even though less frequent, this is also valid for the Transferring to the Receiving in case of late transfer. The content of the Release for Climb is defined in COTR.0068
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0166
Title	Release for descent request
Requirement	An IOP unit **shall** be able to request a Release for descent from its coordination partner.
Status	<In Progress>
Rationale	In Basic IOP, the Receiving RE might need a release for descent from the Transferring RE to manage the flight after an early transfer. Even though less frequent, this is also valid for the Transferring to the Receiving in case of late transfer. The content of the Release for Descent is defined in COTR.0099

Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0068
Title	Release for climb parameters
Requirement	Release for Climb **shall** contain one of the following parameter: • Unlimited • Maximum level • Minimum and maximum levels.
Status	<In Progress>
Rationale	Description of a release for climb.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0099
Title	Release for descent parameters
Requirement	Release for Descent **shall** contain one of the following parameter: • Unlimited • Minimum level • Minimum and maximum levels.
Status	<In Progress>
Rationale	Description of a release for descent.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Negotiation

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0128

Title	Negotiation in Full IOP
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the offset.
Status	<In progress>
Rationale	An offset might be negotiated between the two coordination partners.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0094
Title	Negotiation between multiple partners
Requirement	Negotiations **shall** be possible between more than two successive IOP Units.
Status	<In Progress>
Rationale	There's a need in Full IOP to involve more than two partners in a negotiation.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0095
Title	Third party in negotiation
Requirement	Negotiations **shall** be able to include a third party RE, which could be either: • A third party RE within an IOP Unit that is on the control sequence, or • An RE within a third party Unit that is not on the control sequence.
Status	<In Progress>
Rationale	There's a need in Full IOP to involve a non-crossed partners in a negotiation.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-WIFO.0007
Title	Agreement revision
Requirement	It **shall** be possible for any involved RE to modify or reject a negotiation until it is closed.
Status	<In Progress>
Rationale	In Full IOP, there might be more than two partners involved in the negotiation. As it may take more time to get a final agreement, a partner who already answered might change his mind and either reject or make a counter-proposal.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-WIFO.0011
Title	Negotiation of trajectory elements
Requirement	It **shall** be possible for any negotiation between two IOP units to include elements from the trajectory.
Status	<In progress>
Rationale	In a long term view, in order to replace verbal negotiations by electronic negotiation, the IOP negotiation should be able to focus on one or several items of the following categories: • C&T Data, • elements of the Flight Script defining the planned trajectory, • the RE control sequence. This capability will be progressively deployed among IOP units according to bilateral agreements.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-WIFO.0012
Title	Negotiation of control sequence elements
Requirement	It **shall** be possible for any negotiation between two IOP units to include elements from the control sequence.
Status	<In progress>

Rationale	In a long term view, in order to replace verbal negotiations by electronic negotiation, the IOP negotiation should be able to focus on one or several items of the following categories: • C&T Data, • elements of the Flight Script defining the planned trajectory, • the RE control sequence. This capability will be progressively deployed among IOP partners according to bilateral agreements.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-WIFO.0013
Title	Negotiation of a combination of different elements
Requirement	It **shall** be possible for any negotiation between two IOP units to include a combination of one or several elements from C&T data, Trajectory and/or control sequence.
Status	<In progress>
Rationale	In a long term view, in order to replace verbal negotiations by electronic negotiation, the IOP negotiation should be able to focus on one or several items of the following categories: • C&T Data, • elements of the Flight Script defining the planned trajectory, • the RE control sequence. This capability will be progressively deployed among IOP units according to bilateral agreements.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0091
Title	Negotiation of planned trajectory
Requirement	Transferring RE & Receiving RE **shall** be able to negotiate the planned trajectory
Status	<In progress>
Rationale	Description of the needed negotiable items.
Category	<Interoperability>

Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0206
Title	Route Negotiations eligibility
Requirement	Negotiation of the route modification through electronic dialogues between two successive units **shall** be performed in a time frame from the beginning of the CAP until the end of the NP.
Status	<In Progress>
Rationale	The negotiation phase ends once the flight is assumed by the downstream unit
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Undo Force-Assume

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0159
Title	Undo-Force-Assume
Requirement	After having performed a force-assumption, an IOP Unit **shall** be able to undo-Force-Assume a flight until the stolen flag has been acknowledged.
Status	<in Progress>
Rationale	After erroneous force-assumption, the ATCO should be able to correct the mistake. There should be mitigations to minimize the occurrences of erroneous Force-assumptions.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-COTR.0059
Title	Stolen information cancelled by undo-force-assume

Requirement	After an undo-force-assume, the Stolen information caused by this force-assumption **shall** be cancelled.
Status	<In Progress>
Rationale	As the undo-force-assume functionality corrects a wrong force-assumption, the stolen information coming from this force-assumption should be cancelled.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

E.1.3 Management of FO Flight script

Expansion of the Procedures

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0006
Title	Approach
Requirement	The expanded route **shall** be enriched with every described point of the approach procedure.
Status	<In Progress>
Rationale	The shared information will encompass the arrival phase
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0089
Title	Approach
Requirement	In case of missed approach, the expanded route **shall** be amended with a route amendment containing every described points of the missed approach procedure.
Status	<In Progress>
Rationale	The shared information will encompass the missed approach phase if applicable
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0007
Title	Surface Movement
Requirement	The shared flight information **shall** encompass the description of the surface movements.
Status	<In Progress>
Rationale	Surface movement will be included in the shared information if available (taxiing and apron movements)
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Speed and rate constraints

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0020
Title	Speed constraint description
Requirement	When an IOP Unit shares a speed constraint, it **shall** define how to be compliant with the constraint among the following solutions: • To remain in a speed band (between a minimum and a maximum speed), • To fly at the minimum speed (lowest), • To fly at the maximum speed (highest). In addition to the ones defined in REQ-18-02b-SPRINTEROP- FSMG.0019.
Status	<In Progress>
Rationale	Speed constraints will include a description of how they should be implemented.
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0084
Title	Rate of Climb/Descent

Requirement	When an IOP Unit shares a rate constraint, it **shall** define: • An instruction to fly at the highest possible rate of climb or descent (expedite)*. In addition to the parameters specified in REQ-18-02b-SPRINTEROP-FSMG.0086.
Status	<In Progress>
Rationale	Vertical rate constraints will include a description of how they should be implemented.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Gradient constraint

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0088
Title	Gradient
Requirement	When an IOP Unit shares a gradient constraint, it **shall** define: • A maximum gradient to respect (at or less), or • A minimum gradient to respect (at or greater).
Status	<In Progress>
Rationale	Most of the SIDs are defined with a gradient which, compared to the rate of climb, do not depend on the speed of the aircraft.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Time constraints

Time constraints are always planning or executive constraints (no strategic time constraint).

A time constraint can be open or closed. A TTA/TTO is open (execution phase), a CTA/CTO is open until transmitted to the pilot and acknowledged, a CTA/CTO is closed when the pilot committed to respect a CTA/CTO.

A CTOT is considered as a closed constraint.

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0021

Title	Time Constraints
Requirement	An IOP Unit which shares a time constraint **shall** define its type among the following types: • Calculated Take-off Time (CTOT) • Calculated Time of Arrival (CTA) • Calculated Time Over (CTO) • Target Time of Arrival (TTA) • Target Time Over (TTO)
Status	<In Progress>
Rationale	Time constraints will include a description of how they should be implemented
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0044
Title	Multiple Time Constraints
Requirement	An IOP Unit **shall** be able to handle several planning time constraints.
Status	<In Progress>
Rationale	In the ground system, more than one time constraint can exist at the same time
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0022
Title	CTA/O
Requirement	When accepted by the flight crew CTA or a CTO **shall** be taken in to account in the trajectory.
Status	<In Progress>
Rationale	Before acceptance the CTA/CTO will be considered as an open constraint.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0023
Title	TTA/O
Requirement	For flights in the execution phase (post-departure), the target times **shall** be shared as open constraints (i.e. time constraints which do not model the trajectory)
Status	<In Progress>
Rationale	Target times are considered as information only
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0042
Title	Time constraint
Requirement	A time constraint **shall** encompass all the following items: • A point of the expanded route where the constraint has to be respected, • A time to be respected • A qualifier on the way the time restriction has to be respected ([at], [at or later], [at or before]. Optionally, a duration in case of time interval to be respected can be added.
Status	<In Progress>
Rationale	Time constraints will include a description of how they should be implemented
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Clearances

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0027
Title	Sharing Clearances
Requirement	It **shall** be possible to share every clearance entered into the system, including a cancellation of a clearance, among the IOP Units.

Status	<In Progress>
Rationale	Clearances and their cancelation will be shared
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

For the following requirement, it might be interesting to remember that sometimes, a constraint can be linked to another constraint. This link has to be defined and shared so that any IOP Unit modifying a constraint is aware of this link and take appropriate action regarding this linked constraint.

For example, a Cleared Flight Level (CFL) can be associated to another level constraint as mentioned in the following CPDLC message: "CLIMB TO FL300, CROSS XYZ AT OR ABOVE FL250". If the downstream ATCO modifies the CFL, it has to be aware that this new instruction should take into account the linked one and either, will confirm its validity or cancel it.

Requirement **Error! Reference source not found.**is not limited to level or executive constraints and is e nlarged to any type of constraint.

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0038
Title	Linked constraints
Requirement	An IOP Unit **shall** be able to create, share and have access to linked constraints.
Status	<In Progress>
Rationale	Any actor intending to modify a constraint should be aware of an existing link between several constraints.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Deferred Clearances

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0030
Title	Sharing of a Deferred Clearance
Requirement	An IOP Unit **shall** be able to share a deferred clearance when they provide the parameters to calculate the position on the route where it will start to be applicable.
Status	<In Progress>
Rationale	The partners can provide a position where clearances are applied from.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0031
Title	Start point for a Deferred Clearance
Requirement	When an IOP Unit shares a deferred clearance, the parameters to calculate the position on the route where the clearance will start to be applicable **shall** be one of the following: • A specific point on the route, • an absolute time, • a level.
Status	<In Progress>
Rationale	In this context, a “specific” point is defined as an existing point of the expanded route, or a latitude/longitude on the expanded route, or a distance from an existing point of the expanded route.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0032
Title	Validity of Previous Clearances in case of deferred clearance
Requirement	When a deferred clearance is issued, the previous clearance of the same type (CFL, level, speed, rate, heading, offset or route) **shall** remain valid until the point of the expanded route where the deferred clearance applies.
Status	<In Progress>

Rationale	This requirement ensures that issuing a deferred clearance does not cancel the previous one. It does not prevent the previous one to no longer be applicable before the application of the deferred one for any other reason (e.g. level off).
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

Sharing Cleared Route

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0117
Title	Sharing Cleared Route
Requirement	The current cleared route **shall** be available to all IOP units whose AOI is crossed by the IOP planned trajectory
Status	<In Progress>
Rationale	To enable downstream tools to build a tactical trajectory for portions of the flight where the updated IOP trajectory has not yet been cleared to the aircraft – i.e. where there is a difference between the IOP planned route and the current cleared route
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-FSMG.0118
Title	Calculating planned trajectory where un-cleared portion exists
Requirement	In the case that the planned and cleared routes differ, the IOP Trajectory **shall** be aligned with the un-cleared (planned) portion of the route.
Status	<In Progress>
Rationale	To ensure that the IOP planned trajectory reflects the agreed plan, even if part of that plan is currently un-cleared
Category	<Interoperability>
Implementation	Mandatory

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

E.1.4 Control sequence handling

DELEGATE

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0003
Title	Delegation proposal by Delegator
Requirement	A crossed IOP Unit **shall** be able to propose to delegate a portion of a flight, to a non-crossed IOP Unit, for part or whole of the crossing in their area
Status	<In Progress>
Rationale	An IOP Unit planned to control the flight can indicate a third party to whom the flight will be transferred for a portion of the flight. This can be for the whole of their area of responsibility or only a part .
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0074
Title	Negotiation of the Delegation releases
Requirement	Delegator and Delegatee **shall** be able to negotiate the content of the releases provided by the Delegator.
Status	<In Progress>
Rationale	During the Delegation, negotiation is the way for the Delegator to suggest a change in his airspace to the controlling Delegatee, and for the Delegatee to ask for a change to the Delegator if this change exceeds the offered releases.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0075
Title	Negotiation beyond Delegator's Release

Requirement	When a negotiation in progress modifies the trajectory inside the Delegator's airspace beyond the Releases provided, the Delegator **shall** be included in the negotiation.
Status	<In Progress>
Rationale	A negotiation between the Delegatee and Delegator's up/downstream should not modify the trajectory beyond the degree of freedom offered by the Delegator without asking for his approval.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0065
Title	Delegation implementation according to a LoA
Requirement	An IOP Unit **shall** be able to implement a delegation automatically, based on a Letter of Agreement.
Status	<In Progress>
Rationale	In order to have a relevant control sequence, the Delegation might be implemented before every concerned IOP Unit is in SAP.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

E.1.5 RE SKIP

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0103
Title	Default release upon RE SKIP
Requirement	When an RE is skipped, a default release covering at least the level band between entry and exit transfer flight levels **shall** be provided
Status	<In Progress>
Rationale	The RE controlling the flight in the skipped airspace must be allowed to provide the clearances expected to be given in this airspace. The release allows the skipped RE to maintain separation against the skipped flight
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0104
Title	RE SKIP
Requirement	It **shall** be possible for an RE planned to control the flight to be SKIPed.
Status	<In Progress>
Rationale	A SKIPed user indicates that the RE IOP Unit will not take the aircraft on the frequency (channel).
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0086
Title	Skipped RE upstream the Receiving RE
Requirement	In case of external RE SKIP, an IOP Unit planned to control the flight **shall** indicate every skipped RE of its Unit which is upstream of its Receiving RE.
Status	<In Progress>
Rationale	The Transferring RE must be aware of any skipped RE between him and the Receiving RE.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0087
Title	Skipped RE downstream the Transferring RE
Requirement	In case of RE SKIP, an IOP Unit planned to control the flight **shall** indicate every skipped RE of this Unit which is downstream of its Transferring RE.
Status	<In Progress>
Rationale	The Receiving RE must be aware of any skipped RE between the Transferring RE and himself.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0117
Title	unSKIP of a flight in upstream RE
Requirement	It **shall** be possible for a skipped RE to unSKIP itself while the flight is under control of any upstream RE.
Status	<In Progress>
Rationale	A SKIPed RE is able to revert itself to the unSKIPed state. All data related to the UNSKIP (eg RELASE conditions) are then removed
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0107
Title	unSKIP of a flight in downstream RE
Requirement	It **shall** be possible for a skipped RE to unSKIP itself while the flight is under control of any downstream RE.
Status	<In Progress>
Rationale	A SKIPed RE is able to revert itself to the unSKIPed state. The unSKIP function must remain after the frequency change to next IOP Unit (e.g. in order to be able to perform a Reclaim). All data related to the UNSKIP (eg RELASE conditions) are then removed
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0108
Title	RE Unskip by the Unit expected to control
Requirement	The RE expected to control the flight on behalf of a skipped RE of another IOP Unit **shall** be able to UNSKIP the skipped RE.
Status	<In Progress>

Rationale	When the traffic conditions have changed since the SKIP implementation, the IOP Unit expected to control the flight might decide that the additional workload associated with the SKIP is no longer appropriate.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0109
Title	C&T data update in case of RE unskip
Requirement	In case of UNSKIP of an RE skipped in favour of an RE belonging to another IOP Unit the control sequence **shall** be updated and shared between both RE's, and C&T data re-evaluated, taking into account current aircraft position in relation to boundary.
Status	<In Progress>
Rationale	This applies only to the case of an RE skipped in favour of the upstream. In case of UNSKIP where the boundary is already overflown the original C&T contractual data at the boundary might be obsolete, e.g. when the flight is in climb/descend.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0110
Title	Downstream RE is proposed to be SKIPed
Requirement	Both the Transferring RE and the Receiving RE **shall** be able to propose the Receiving RE to be skipped in favour of the upstream.
Status	<In Progress>
Rationale	This covers the following requests: T.RE proposes skipping R.RE and T.RE to manage the flight R.RE proposes skipping R.RE and T.RE to manage the flight
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0111
Title	Upstream RE is proposed to be SKIPed
Requirement	Both the Transferring RE and the Receiving RE **shall** be able to propose the Transferring RE to be skipped in favour of the downstream.
Status	<In Progress>
Rationale	This covers the following requests: T.RE proposes skipping T.RE and R.RE to manage the flight R.RE proposes skipping T.RE and R.RE to manage the flight
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0112
Title	Transfer to a skipped RE
Requirement	If a change of frequency input is made to a skipped RE, the SKIP **shall** be undone.
Status	<In Progress>
Rationale	The controlling ATCO must be able to cancel the SKIP of an RE by transferring the flight to the skipped RE.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0113
Title	Force-Assume by a RE belonging to a skipped IOP Unit
Requirement	If a skipped RE force-assumes the flight the SKIP **shall** be undone.
Status	<In Progress>
Rationale	If the flight is assumed by a skipped RE, the SKIP must be undone.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0114
Title	Automatic SKIP implementation
Requirement	When the conditions are compliant with the ones defined in a Letter of Agreement, an IOP Unit **shall** be able to automatically implement an external SKIP.
Status	<In Progress>
Rationale	In order to have a relevant control sequence, the SKIP might be implemented based on a Letter of Agreement, e.g. before every concerned IOP Unit is in SAP.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0115
Title	SKIP negotiation
Requirement	When conditions are not compliant with the ones defined in a Letter of Agreement, an IOP Unit **shall** be able to implement an external Skip after receiving a positive response (manual or automatic) to its proposal.
Status	<In Progress>
Rationale	When it involves two different IOP Units, the SKIP must be approved by both parties before being implemented, unless foreseen in a Letter of Agreement or verbally agreed (see REQ-18-02b-SPRINTEROP-SEQM.0095).
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-SEQM.0116
Title	Verbally agreed SKIP
Requirement	When conditions are not compliant with the ones defined in a Letter of Agreement, an IOP Unit **shall** be able to implement an external Skip by indicating that the Skip proposal was verbally agreed.
Status	<In Progress>
Rationale	The implementation of an external Skip must be agreed by both parties as another IOP Unit takes the control responsibility. The agreement can be defined in a letter of agreement (SEQM.0094) thanks to an electronic dialogue (SEQM.0018) or here, by phone.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management

E.1.6 AIR/GROUND

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0001
Title	Sharing Aircraft View of Planned Trajectory
Requirement	An IOP Unit **shall** share ADS-C information including the Extended Projected Profile (EPP) received from the aircraft upon receiving a new report containing the information.
Status	<In Progress>
Rationale	The aircraft view needs to be made accessible to other interested stakeholders (both ATS units and NM) so that the air and ground trajectories can be synchronized and other ground stakeholders can take advantage of the information to improve their trajectory prediction or other functions that use trajectory information.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG03.0100
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Communications (AGDC)
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Services (AGDS)
<ALLOCATED_TO>	<Functional block>	Trajectory Prediction & Mgt (TP&M)

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0002
Title	Sharing Consistency Check Indication
Requirement	An IOP Unit performing the air/ground synchronization process **shall** indicate the point of the trajectory where its local planned trajectory is no longer synchronized with the aircraft view.
Status	<In Progress>
Rationale	Downstream ATS units may be interested in the consistency status of those ATS units which lie upstream to determine the potential validity of using the EPP information or performing some i4D operations within the AoR (e.g. suitability of EPP ETAs for AMAN, validity of requesting the ETA min/max or agreeing a CTA with the flight crew, etc.).
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG5a.0100
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Services (AGDS)

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0003
Title	Share ETA Min/Max request
Requirement	An IOP Unit **shall** be able to share an ETA min/max request, indicating on which point of the trajectory it applies.
Status	<In Progress>
Rationale	To enable the operation if the downstream IOP Unit does not have the necessary air/ground interoperability.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Services (AGDS)

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0004
Title	Share ETA Min/Max
Requirement	The requesting IOP Unit **shall** share the ETA min/max received from an aircraft for a significant point specified by a downstream IOP Unit.
Status	<In Progress>
Rationale	To enable the operation if the downstream IOP Unit does not have the necessary air/ground interoperability.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Services (AGDS)

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0005
Title	Notification of a CTA/CTO rejection by ATC
Requirement	An IOP Unit **shall** share a rejection of a CTA/CTO request from another IOP Unit.
Status	<In Progress>
Rationale	The arrival IOP Unit needs to know the status of the CTA proposal.

Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG06.0600
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Coordination & Transfer (C&T)
<ALLOCATED_TO>	<Functional block>	CHMI Mgt

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0006
Title	Notification of CTA/CTO Status
Requirement	The IOP Unit **shall** share the airborne acceptance, rejection or stand-by response to the CTA instruction.
Status	<In Progress>
Rationale	The arrival IOP Unit needs to know the status of the CTA proposal.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG06.0500
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Communications (AGDC)
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Services (AGDS)
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Coordination & Transfer (C&T)
<ALLOCATED_TO>	<Functional block>	CHMI Mgt

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0007
Title	Request CTA/CTO Cancellation
Requirement	The IOP Unit that initiated a CTA/CTO instruction or is controlling the aircraft **shall** be able to cancel this instruction.
Status	<In Progress>
Rationale	The trajectory should not be constrained with a CTA if it is no longer needed.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG05.0500
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Coordination & Transfer (C&T)
<ALLOCATED_TO>	<Functional block>	CHMI Mgt

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0008
Title	Notify CTA/CTO Cancellation
Requirement	When a CTA/CTO closed constraint (i.e. approved by the aircraft) is cancelled, the IOP Unit **shall** share the acknowledgement of the cancellation by the aircraft.
Status	<In Progress>
Rationale	The IOP Units need to know the status of the CTA.
Category	<Interoperability>
Implementation	

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG08.0300
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Communications (AGDC)
<ALLOCATED_TO>	<Functional block>	Air-Ground Datalink Services (AGDS)
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Coordination & Transfer (C&T)
<ALLOCATED_TO>	<Functional block>	CHMI Mgt

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0009
Title	CTA/CTO instruction request
Requirement	An IOP Unit **shall** be able to request the provision of a CTA/CTO to the IOP Unit logged to the Aircraft.
Status	<In Progress>
Rationale	For DCB reasons, a downstream IOP Unit should be able to instruct a controlled time to an aircraft before controlling it.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG06.0600
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Coordination & Transfer (C&T)
<ALLOCATED_TO>	<Functional block>	CHMI Mgt

[REQ]

Identifier	REQ-XX-XX-SPRINTEROP-AGSY.0010
Title	CTA/CTO instruction management
Requirement	An IOP Unit **shall** be able to manage CTAs and CTOs.
Status	<In Progress>
Rationale	IOP must support the exchange, the set and cancellation of CTAs/CTOs.
Category	<Interoperability>
Implementation	Optional

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJXX-XX
<SATISFY>	<Information Exchange>	Flight Information Distribution
<SATISFIES>	<ATMS Requirement>	REQ-05.06.01-OSED-SG06.0600
<ALLOCATED_TO>	<Functional block>	G/G IOP Management
<ALLOCATED_TO>	<Functional block>	Coordination & Transfer (C&T)
<ALLOCATED_TO>	<Functional block>	CHMI Mgt

E.1.7 Requirements for Air-Ground Trajectory Synchronization

ETA Min/max

The following table describes the information subsequently referenced in the requirements associated to the Request ETA Min/Max process.

Information Element	Description
ETA min/max	ETA min/max provided by the aircraft identifies: - The computation time for the trajectory information - The ETA for the specified significant point - The significant point to which the ETA min/max information applies - Minimum ETA, indicating the earliest estimated time at which the aircraft could reach the associated significant point with high probability - Maximum ETA, indicating the latest estimated time at which the aircraft could reach the associated significant point with high probability

Table 129: ETA Min/Max

CTA

The following table describes the information subsequently referenced in the requirements associated to the Propose CTA and Cancel CTA processes.

Information Element	Description
CTA	Details of the CTA time constraint provided through an ATC instruction that is issued to a flight or provided in advance of such issue: - Identification of the significant point on which the CTA should be applied - The time (to a precision of seconds) - A tolerance indicating the accuracy with which the CTA time needs to be met
CTA Status	An indication as to whether the CTA time constraint is proposed, accepted, rejected or cancelled

Information Element	Description
CTA Cancellation	An ATC instruction that is issued to a flight to cancel a CTA

Table 130: CTA related information

Cancel CTA

During the Execute CTA process, if it is determined that the CTA is no longer operationally required or it is recommended to revert to normal operations, the CTA constraint needs to be cancelled. By removing the constraint, the aircraft no longer has to constrain its profile in order to (try to) meet the CTA.

When the flight is currently under the jurisdiction of an upstream IOP Unit, the request to cancel the CTA needs to be shared. The IOP Unit with current control authority over the flight will need to issue the instruction to cancel the CTA to the flight crew.

-END OF DOCUMENT-