SESAR Solution PJ.0-W2-25.1 TS-IRS (Final) for V3

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PJ.02-W2 AART

SAFETY SUPPORT TOOLS FOR AVOIDING RUNWAY EXCURSIONS

This V3 TS/IRS[1] is part of a project that has received funding from the SESAR Joint Undertaking under grant agreement No 874477 under European Union's Horizon 2020 research and innovation programme.

Abstract of Solution PJ.02-W2-25.1

Solution PJ.02-W2-25.1 "Enhanced runway condition awareness for runway excursion prevention" addresses a safety issue, already studied in SESAR Wave 1 PJ.03b-06 solution, i.e. the risk of runway excursions during take-off and landing. Runway excursions are the most frequent type of runway safety accident (22% of all accidents over the 2010-2014 period according to IATA Safety Report [23]). The aim is to focus on how the risk of runway excursion can be mitigated by on-board and ground systems that could warn pilots, controllers and airport operator when appropriate. This solution requires a better knowledge of runway conditions based in particular on the ICAO Global Reporting Format relating to runway surface conditions, and, in addition to safety, can improve the runway capacity and runway capacity resilience in adverse weather situation through a better management of runway inspections and decontamination operations.

Solution PJ.02-W2-25.1 focuses on following ground and on-board capabilities addressing AO-0216 (Enhanced Runway Condition Awareness):

- RCAMS is a ground-based system operated by the Airport Operator. It performs a continuous assessment of current runway surface condition and provides a short-term forecast of runway conditions. Under Airport Operator control, it disseminates this information to other stakeholders (especially Tower ATCO).

- OBACS is an airborne system generating reports of runway surface condition as sensed by the braking aircraft.

This document describes the Technical Architecture and collects System Requirements (functional and non-functional) which shall guide the development and implementation of prototypes for avoiding runway excursions for solution PJ.02-W2-25.1. Such System Requirements are derived from the Operational Requirements collected by the specification of previous R&D projects and studies, and from SESAR project PJ.02-W2-25.1 "Enhanced runway condition awareness for runway excursion prevention" Table of Contents

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[1] The opinions expressed herein reflect the author's view only. Under no circumstances shall the SESAR Joint Undertaking be responsible for any use that may be made of the information contained herein.

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1 Executive summary

A runway excursion is defined as "an event in which an aircraft veers off or overruns the runway surface during either take-off or landing". The risk of a runway excursion is increased by wet and contaminated runways, in combination with gusts or strong cross or tailwinds.

The most straightforward way to prevent such events is to give to Flight Crews clear and objective information for them to make the right decisions in the preparation and execution of take-off, approach, and landing phases. While the main focus of services provided by solution PJ.02-W2-25.1 is to prevent overruns, caused by the wrong estimation of runway surface condition, it may also contribute to the prevention of other types of excursions by increasing the awareness of all involved actors.

The solution is compatible with the GRF [44], [49], [57] which uses the Runway Condition Assessment Matrix (RCAM) and resulting Runway Condition Code (RWYCC) as a mean to uniformly communicate the runway condition to all stakeholders. Solution PJ.02-W2-25.1 is built of two[2][3] cooperating systems that together aim to provide continuous awareness of the Current RWYCC as well as the Predicted RWYCC (a short term RWYCC forecast):

- RCAMS is a ground-based system operated by the Airport Operator. It performs a continuous assessment of current runway surface condition and provides a short-term forecast of runway conditions. Under Airport Operator control it disseminates this information to other stakeholders.
- OBACS is an airborne system generating reports of runway surface condition as sensed by the braking aircraft. The reports are in line with GRF.

The solution is designed to be implementable in all airport operating environments regardless of their complexity and layout.

Solution PJ.02-W2-25.1 mainly addresses runway overruns, is continuation of PJ.03b-06 solution which was part of SESAR IR wave 1, and has initial V2 maturity level. The PJ.03b-06 results are described in more detail in the PJ.03b-06 V2 VALR [72][56]. Although the concept has been validated with a promising outlook, there were some remaining technical issues addressed in the V3 phase activities:

- Precise RCAMS technical definition also in non-nominal or failure cases
- Validation of the RCAMS with OBACS combined solution operational and technical integration.

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[2] PJ.03b-06 has been comprised of four systems. It also validated ROAAS to V2 level. However, following the development in wave 1 DASSAULT has developed the system outside of SESAR. It is expected to mature independently to V3+ maturity (certified system ready in operational deployment). Moreover, this new instance of ROAAS is able to work with all RWYCC as opposed to dry/wet of PJ.03b-06. This is in line with PJ.03b-06 recommendations. As a result, ROAAS is now considered a part of working method but it is not developed in wave 2.

[3] The last missing system - TOMS has been moved to solution PJ.02-W2-25.2 due to low maturity level.

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2 Introduction

A runway excursion is the event in which an aircraft veers off or overruns the runway surface during either take-off or landing. Runway excursions have not been addressed at all in SESAR 1. However, they represent the most frequent accident category for worldwide accidents for the 2004-2009 period (IATA 2004-2009 RE Analysis report [45]). ICAO (Global Runway Safety Symposium 2011) has noted that the rate of runway excursions has not decreased during the past 20 years.

Wave 2 PJ.02-W2-25.1 solution continues the work done in Wave 1 PJ.03b-06 solution targeting V3 maturity.

2.1 Purpose of the document

This document is the Technical Specification (TS/IRS) for Solution PJ.02-W2-25.1 for V3 phase and represents one of the key deliverables of the SESAR Project PJ.02 AART Airport Airside and Runway Throughput data pack.

TS/IRS document provides the technical requirements specification of the PJ.02-W2-25.1 solution, covering functional, non-functional and interface requirements related to SESAR Solution. TS/IRS also specifies the functional description and the logical interfaces with external functional blocks and describes functional interface requirements addressing the "what" and not the "how".

2.2 Scope

This TS/IRS covers functional, non-functional and interface requirements related to SESAR Solution PJ.02-W2-25.1. The listed requirements shall comply with the operational requirements listed in the OSED document [39].

Final (present) version of this document includes outcomes of the following exercises:

- EXE-02-W2-25-V3-VALR-0001 - Integrated RCAMS-OBACS shadow mode;

2.3 Intended readership

This TS/IRS is written to provide useful information to the following audience:

- **SESAR JOINT UNDERTAKING (SJU)** as SESAR 2020 Programme coordinator.
- **Project PJ.02-W2 AART** (other Work Areas and Project Content Integration Team) to ensure consistency,
- **Project PJ.04-W2 TAM (Total Airport Management),** as PJ.02-W2-25.1 developments can be interesting for this project
- **PJ19 W2 CI (Content Integration)** responsible for managing the content integration process to ensure the needed coherency (in terms of operational concept, architecture) between the different SESAR 2020 projects.
- **Project PJ.20 W2 AMPLE (Master Planning)** responsible for ATM Master Plan maintenance.
- International Organizations (Standard setting Bodies, International Airport Associations, ICAO, etc.) can be interested in the standardization of functionalities and services specified in this document, and therefore plan to define specifications which could become industry standards.

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2.4 Background

The subject has already been studied by EUROCONTROL and the FAA, and is supported by the following initiatives:

- European Action Plan for the Prevention of Runway Excursions (EAPPRE) - Edition 1.0 - EUROCONTROL - January 2013 [50]
- A Study of Runway Excursions from an European Perspective, EUROCONTROL – March 2010 [54],
- Take Off and Landing Performance Assessment (TALPA) Initiative by the FAA [55].

Moreover, the baseline from which this document has been written consists of:

- SESAR 1 Technical Specification documents

    o "SESAR1, Airport Technical Architecture Description". Edition: 00.02.00, 17/06/2016.- [38]

- SESAR Wave 1 PJ.03b-06 delivered FINAL TS/IRS:

    o SESAR Solution PJ.03b-06 TS-IRS for V2 [61]

2.5 Structure of the document

The document is organised as described hereafter:

- Chapter 1: Executive Summary.
- Chapter 2: Introduction. This chapter contains a general introduction, the scope and purpose of the document. This chapter provides also the glossary of terms, acronyms and terminology used in this TS IRS document.
- Chapter 3: SESAR Solution Impacts on Architecture. This chapter describes the architecture and relationships with EATMA.
- Chapter 4: Technical Specifications. This chapter forms the majority of the document. It includes EATMA views and the functional and non-functional requirements for UPMS.
- Chapter 5: Implementation Options.
- Chapter 6 Assumptions.
- Chapter 7: References and Applicable Documents. This chapter lists the resources used throughout this document.
- Appendix A – Service Description Document (SDD).

2.6 Glossary of terms

Term	Definition	Source of the definition
Advanced Surface Movement Guidance and Control System (A-SMGCS)	A system providing routing, guidance and surveillance for the control of aircraft and vehicles in order to maintain the declared surface movement rate under all weather conditions within the aerodrome visibility	[43]

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	operational level (AVOL) while maintaining the required level of safety.	
AIR-REPORT	A report from an aircraft in flight prepared in conformity with requirements for position, and operational and/or meteorological reporting.	[44]
AIS	Aeronautical Information	[2]
Braking Action **BA**	A term used by pilots to characterize the deceleration associated with the wheel braking effort and directional controllability of the aircraft.	[46]
Computed Braking Action Computed BA	Braking Action value resulting from On-board and Aircraft based computation (OBACS), and reported using the standardized scale of Runway Condition Assessment Matrix.	[39]
Computed Current Runway **Condition**	Current Runway Condition computed by RCAMS	[39]
Computed Current RWYCC	Current RWYCC computed by RCAMS	[39]
Computed Predicted RWYCC	Predicted RWYCC computed by RCAMS	[39]
Contaminated runway	'Contaminated runway' means a runway of which a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed under the runway surface condition descriptors.	[40]
Current Runway Condition (RWY Condition)	Current RWYCC for each third of the runway, type, coverage and depth of the contaminants present on each third of the runway.	[61]

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Current Runway Condition Code Current RWYCC	The Runway Condition Code observed or validated computed RWYCC for a given Runway at the present time.	[61]
Current RWYCC input source data	Input source data used for Computed Current RWYCC calculation	[61]
Decontaminated runway	'Decontaminated runway' means a runway whose surface has been treated with deicers to prevent bonds from forming between snow and ice and moisture in the pavement, or to break those bonds once formed.	[61]
Dry runway	'Dry runway' means a runway whose surface is free of visible moisture and not contaminated within the area intended to be used.	[40]
Measured Surface Friction	A term used by ground staff for SNOWTAM reporting purposes to characterize the slipperiness of the runway surface due to presence of contaminants and prevailing weather conditions (μ).	[46]
Freezing Point	The freezing point is the temperature at which a liquid changes to a solid[4].	Encyclopaedia Britannica
In-flight Landing distance	Landing distance computed on board prior to any landing, taking into account updated parameters regarding the aircraft status (weight, configuration, etc.…) and airfield status (latest weather data, runway slope and any	[39]

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[4] 0° for pure water at sea level, lower value may be induced by chemical treatment previously applied on the surface.

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	eventual contamination, etc.), to be compared with Landing Distance Available (LDA) on destination runway.	
LDA	Landing Distance Available	[39]
LDR	Landing Distance Requested	[39]
Manually adjusted Current RWYCC	Manually Adjusted Current RWYCC is the Runway Condition Code value which the Airport Operator input when the Computed Current RWYCC value proposed by RCAMS is not convenient	[61]
Meteorological Forecast	EATMA definition	[2]
Meteorological Observation	EATMA definition	[2]
Non-stabilized approach	Approach trajectory or ground speed which could lead to a runway excursion.	[39]
On-board Computed Braking Action	Braking Action automatically reported by an OBACS equipped aircraft	[39]
Predicted Runway Condition	Predicted RWYCC for each third of the runway, type, coverage and depth of the contaminants present on each third of the runway.	[61]
Predicted RWYCC	The Runway Condition Code computed for a given Runway for a near future time.	[39]
Predicted RWYCC input source data	Input source data used for Computed Predicted RWYCC calculation	[61]
RCAMS	The Runway Surface Condition computing system	[61]
Reference RWYCC	The Runway Condition Code presented to the RCAMS as a reference value having precedence over computation. RCAMS should take into	[39]

	account the reference values in subsequent computation following any input of new reference value. Reference is generally a result of manual inspection.	
Runway Condition Code (RWYCC)	A number describing the runway surface condition to be used in the runway condition report. Note: The purpose of the runway condition code is to permit an operational aeroplane performance calculation by the flight crew. Procedures for the determination of the runway condition code are described in the PANS-Aerodromes (Doc 9981).	[40] [49]
Runway Condition Report	Runway condition report (RCR) means a comprehensive standardised report initiated by Airport Operator means relating to runway surface conditions and their effect on the aeroplane landing and take-off performance.	[40]
Runway Freezing Point	The freezing point of the substance covering the runway at the predefined location where this measurement is performed. The contaminated and decontaminated runway has different Freezing points.	[61]
Runway Friction Status	Current Runway Condition + Predicted Runway Condition	[61]
Runway Surface condition	Current RWYCC for each third of the runway + Predicted RWYCC for each third of the runway. Runway Surface condition is characterised by the state of	[40], [46]

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	the surface of the runway, either dry, wet or contaminated. Runway surface condition(s) means a description of the condition(s) of the runway surface used in the runway condition report which establishes the basis for the determination of the runway condition code for aeroplane performance purposes. Note 1: the runway surface conditions used in the runway condition report establish the performance requirements among the aerodrome operator, aeroplane manufacturer and aeroplane operator. Note 2: aircraft de-icing chemicals and other contaminants are also reported but are not included in the list of runway surface condition descriptors because their effect on runway surface friction characteristics and the runway condition code cannot be evaluated in a standardised manner.	
Runway surface condition descriptors	'Runway surface condition descriptors' means one of the following elements on the surface of the runway (note: the descriptions under (a) to (h) below are used solely in the context of the runway condition report and are not intended to supersede or replace any existing World Meteorological Organization (WMO) definitions): • (a) 'Compacted snow': snow that has been	[40]

	compacted into a solid mass such that aeroplane tires, at operating pressures and loadings, will run on the surface without significant further compaction or rutting of the surface. • (b) 'Dry snow': snow from which a snowball cannot readily be made. • (c) 'Frost': ice crystals formed from airborne moisture on a surface whose temperature is below freezing[5]; frost differs from ice in that the frost crystals grow independently and, therefore, have a more granular texture[6]. • (d) 'Ice': water that has frozen or compacted snow that has transitioned into ice, in cold and dry conditions. • (e) 'Slush': snow that is so water-saturated that water will drain from it when a handful is picked up or will splatter if stepped on forcefully. • (f) 'Standing[7] water': water of depth greater than 3 mm.	

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[5] "Below freezing" refers to air temperature equal to or lower than the freezing point of water (0 °C or less if chemical treatment of surface was used).

[6] Under certain conditions, frost can cause the surface to become very slippery, and it is then reported appropriately as 'reduced braking action'.

[7] Running water of depth greater than 3 mm is reported as 'standing water' by convention.

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	• (g) 'Wet ice': ice with water on top of it or ice that is melting[8]. (h) 'Wet snow': snow that contains enough water to be able to make a well-compacted, solid snowball, but water will not squeeze out.	
Significant Current RWYCC or Significant Predicted RWYCC	Different Computed Current RWYCC (or Computed Predicted RWYCC) are qualified as significant (or considered as a set of Significant Current RWYCC (or Significant Predicted RWYCC)) when their associated probabilities are similar and one of them is of maximum probability.	[61]
Surface Condition Sensor	Sensor installed on each third of each runway of an airport able to continuously measure some basic environmental parameters (e.g. ground temperature, freezing point). The more advanced version of those sensors provides continuous estimate of the type and depth of surface contaminant	[61]
Surveillance based friction estimate	Computed runway friction estimate by analysing ground trajectory and deceleration behaviour of landing aircraft based on available surveillance data. This methodology is not viable for all surveillance sources.	[39]

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[8] Freezing precipitation can lead to runway conditions associated with wet ice from an aeroplane performance point of view. Wet ice can cause the surface to become very slippery. It is then reported appropriately as 'reduced braking action'.

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Transmitted Braking Action PIREP	Braking Action ATC Input after a PIREP reported by a Flight Crew	[39]

Table 1: Glossary

2.7 Acronyms and Terminology

Term	Definition
ACARS	Aircraft Communications Addressing and Reporting System
ACC	Area Control Center or area control
Activities	EATMA definition: A logical process, specified independently of how the process is carried out
ADS-B	Automatic Dependant Surveillance - Broadcast
ADD	Architecture Description Document
AFTN	Aeronautical fixed telecommunication network
AIM	ATFCM Information Message
AIP	Aeronautical information publication
AIS	Aeronautical information services
AIREP	AIRcraft REPort (Automatic air report)
AN	Availability Note
ANSP	Air Navigation Services Provider
AO	Aircraft operator
AOC	Airline Operations and Control Centre
AOP	Airport Operations Plan
APOC	Airport Operations Centre
APP	Approach Control
APT	Airport
ARC	Aviation Rulemaking Committee (FAA)
ATC	Air Traffic Control
ATCO	Air Traffic Controller

ATCT	Air Traffic Control Tower
ATIS	Automatic Terminal Information Service
A-SMGCS	Advanced Surface Movement Guidance and Control System
ATM	Air Traffic Management
ATM-MET	Combination of ATM and MET, dervived from Air Traffic Management and Meteorological.
ATM MP	Air Traffic Management Master Plan
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Services
ATSU	Air Traffic Service Unit
AU	Airspace User
AVOL	Aerodrome Visibility Operational Level
AWOS	Automated Weather Observing System
BA	Braking Action
BACF	Braking Action Computation Function
CC	Capability Configuration
CEF	Cost Efficiency KPA
CFME	Continuous Friction Measuring Equipment: a device designed to produce continuous measurement of runway friction values
CNS	Communication Navigation and Surveillance
COM	Communications
CONOPS	Concept of Operations
CORSAIR	COntaminated Runway State Automatic Identification and Reporting: AIRBUS project aiming to provide on-board airplane based computed braking action.
CR	Change Request
CWP	Controller Working Position
D-ATIS	Data link Automatic Terminal Information Service

DH	Decision Height
EASA	European Aviation Safety Agency
EATMA	European ATM Architecture
E-ATMS	European Air Traffic Management System
EN	Enabler
ER	En Route
ESF	Estimated (runway) Surface Friction
EU	European Union
EUROCAE	European Organization for Civil Aviation Equipment
FAA	Federal Aviation Administration
FICON	FIeld CONdition (US equivalent of SNOWTAM)
FMS	Flight management system
FOC	Flight Operational Control / Flight Operations Centre
GDN	Gdansk-LW airport
GRF	Global Report Format
HMI	Human Machine Interface
HPAR	Human Performance Assessment Report
IBP	Industrial Based Platform
ICAO	International Civil Aviation Organisation
IEC	International Electrotechnical Commission
IER	Information Exchange Requirement
INTEROP	Interoperability Requirements
IP	Internet protocol
IRS	Interface Requirements Specification
ISO	International Organization for Standardization
ISRM	Information Services Reference Model
KPA	Key Performance Area

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KPI	Key Performance Indicator
LDA	Landing Distance Available
LW	Lech Wałęsa
MET	Meteorological or meteorology
METAR	METeorological Aerodrome Report
MF	Metering Fix
MSP	Multi Sector Planner
NAF	NATO Architecture Framework
NSOV	NAF Service Oriented View
Node	EATMA definition: A logical entity that performs Activities. Note: nodes are specified independently of any physical realisation
NOP	Network Operations Plan
NOTAM	Notice To Airmen
NOV	NAF Operational View
NPA	Notice of Proposed Amendment (EASA)
NSV	NAF System View
NWP	Numerical Weather Prediction
OBACS	On-board Braking Action Computation System
OI	Operational Improvement
OPS	Operations
OSED	Operational Service and Environment Definition
PAR	Performance Assessment Report
PIREP	PIlot REPort (Pilot air report)
PIRM	Programme Information Reference Model
QoS	Quality of Service
R/T	Radio-Telephony
RBT	Reference Business Trajectory
RCAM	Runway Condition Assessment Matrix

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RCAMS	Runway Condition Awareness and Monitoring System
RCC	TBD
RCR	Runway Condition Report
ROAAS	Runway Overrun Awareness and Alerting System[9]
ROT	Runway Occupancy Time
RPAS	Remotely Piloted Aircraft System
RWY	Runway
RWYCC	Runway Condition Code
SAC	Safety Criteria
SAFE	Safer Airports and Flights for Europe (SESAR Project PJ.03B)
SAR	Safety Assessment Report
SARP	Standard And Recommended Practice (ICAO)
SDD	Service Description Document
SecAR	Security Assessment Report
SESAR	Single European Sky ATM Research Programme
SHF	Super High Frequency [3 000 to 30 000 MHz]
SIP	Slot Improvement Proposal
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SNOWTAM	Snow-related NOTAM
SO	Safety Objective
SoaML	Service Oriented Architecture Modelling Language
SPR	Safety and Performance Requirements

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[9] Due to outside of SESAR developments ROAAS is now considered able to process all RWYCC as opposed to PJ.03b-06 documentation where special category "Advanced ROAAS" was defined. This is no longer necessary for wave 2.

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SR	Safety Requirement
SUR	Surveillance
SUT	System Under Test
SWIM	System Wide Information Model
TALPA	Take-off And Landing Performance Assessment
TCP	Transfer of control point
TOD	Top of Descent
TOMS	Take-off Monitoring System
TRL	Technology Readiness Level
TS	Technical Specification
TWR	Aerodrome control tower or aerodrome control
UAV	Unmanned Aerial Vehicle
UC	Use Case
UDPP	User Driven Prioritisation Process
UHF	Ultra High Frequency [300 to 3 000 MHz]
UML	Unified Modelling Language
V&V	Validation and Verification
VALP	Validation Plan
VALR	Validation Report
VALS	Validation Strategy
VHF	Very-High Frequency (radio spectrum band)
WMO	World Meteorological Organization
WSDL	Web Services Definition Language
Wx	Weather
XSD	XML Schema Definition

Table 2: Acronyms and terminology

3 SESAR Solution Impacts on Architecture

3.1 Target Solution Architecture

3.1.1 SESAR Solution(s) Overview

Runway Condition Awareness and Monitoring System (RCAMS) supports airport duty officers in facilitating the continuous runway condition awareness. Built-in runway sensors and a dedicated runway condition model are the core elements of this system. RCAMS is delivering a dedicated interface for duty officers equipped with both appropriate alerts and assistance in rapid Runway Condition Report (RCR) dissemination to critical stakeholders (e.g. Control Tower). RCAMS is fully compatible with the Global Reporting Format (GRF) introduced by ICAO.
The ground-based system is supported by an On-board Braking Action Computation System (OBACS) which estimates the runway condition during the landing roll. The resulting measurements are pushed automatically to RCAMS interface allowing for subsequent duty officer alerting if needed. OBACS output can also be used independently by the flight crew for PIREP (Pilot Report) assistance.

This solution is targeting all airport operating environments and is expected to reduce the probability of runway excursion occurrence.

PJ.02-W2-25.1 Solution OIs and Enablers:

SESAR Solution ID	SESAR Solution Title	OI Steps ID	OI Steps Title	Enabler ID	Enabler Title	OI Step/Enabler Coverage
PJ.02-W2-25.1	Enhanced runway condition awareness for runway excursion prevention	AO-0216	Enhanced runway condition awareness for runway excursion prevention	AIRPORT-57	Runway condition awareness management system based on manual assessment, weather information and runway sensors + PIREP + machine-learning based RWY condition model and predictions	Full coverage Required/Developed

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PJ.02-W2-25.1	Enhanced runway condition awareness for runway excursion prevention d	AO-0216	Enhanced runway condition awareness for runway excursion prevention	AIRPORT-59 (STD-090)	RCAMS system function to integrate aircraft observed runway braking action into runway condition information	Full coverage Optional/Developed
PJ.02-W2-25.1	Enhanced runway condition awareness for runway excursion prevention	AO-0216	Enhanced runway condition awareness for runway excursion prevention	A/C-84b	Braking action computation function in on-board braking action computation system (OBACS) for business jet	Full coverage Optional/Developed
PJ.02-W2-25.1	Enhanced runway condition awareness for runway excursion prevention	AO-0216	Enhanced runway condition awareness for runway excursion prevention	A/C-84a	Braking action computation function in on-board braking action computation system (OBACS) for airlines	Full coverage Optional/ Used
PJ.02-W2-25.1	Enhanced runway condition awareness for runway excursion prevention	AO-0216	Enhanced runway condition awareness for runway excursion prevention	A/C-64	Data transmission means supporting downlinked observed runway surface condition (aircraft side)	Full coverage Optional/used

| PJ.02-W2-25.1 | Enhanced runway condition awareness for runway excursion prevention | AO-0216 | Enhanced runway condition awareness for runway excursion prevention | SVC-071 | Runway Braking Action service | Full coverage Optional/Used |
| PJ.02-W2-25.1 | Enhanced runway condition awareness for runway excursion prevention | AO-0216 | Enhanced runway condition awareness for runway excursion prevention | SVC-061 | Runway condition report service | Full coverage Optional/developed |

Table 3: PJ.02.25.1 Solution Overview - Scope and related OI steps/enablers

3.1.1.1 Deviations with respect to the SESAR Solution(s) definition

Enabler	Opt/Req	Deviation
A/C-64_Data transmission means supporting downlinked observed runway surface condition (aircraft side)	Optional	CR-07236
A/C-84b_Braking action computation function in on-board braking action computation system (OBACS) for business jet	Optional	CR-07249
A/C-84a_Braking action computation function in on-board braking action computation system (OBACS) for airliners	Optional	CR-07233 CR-07234 CR-07235
AIRPORT-57_Runway condition awareness management system based on manual assessment, weather information and runway sensors + PIREP + machine-learning based RWY condition model and predictions	Required	CR-07237
AIRPORT-59_ RCAMS system function to integrate aircraft observed runway braking action into runway condition information	Optional	CR-07238
SVC-061_Runway condition report service	Develop	CR-07239 CR-07250
SVC-071_Runway Braking Action service	Develop	CR-07240

Table 4 : PJ.02-W2-25.1 Solution Overview – Deviations[10]

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[10] Those CRs are not already accepted, and will be submitted for DS-23

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3.1.1.2 Relevant Use Cases

Operational Use Case	Description
[NOV-5] Failure of local RCR dissemination via RCAMS	**Abstract** This Use Case describes the sequence of events in case the local dissemination function is disrupted. Local dissemination function of RCAMS is responsible for passing information to ATCO and within AO organisation. **Actors** - Duty Officer - Tower Controller - RCAMS System Admin **Assumptions** - RCAMS is installed and running on an airport - The roles of RCAMS System Admin is defined in Airport Operator organisation - The failure affects the local Tower. **Pre-conditions** - N/A **Triggering-event** - RCAMS detects inability to push data to local HMIs **Use Case Steps** 1. Affected RCAMS HMIs display appropriate alert and shut down. 2. An apropriate alert is presented to DO. 3. DO establishes fall-back R/T communication of RWY condition with ATCO. 4. Tower ATCO continues operation with runway condition to be communicated via R/T. 5. RCAMS System Administrator is advised of the issue. 6. RCAMS System Administrator investigates the issue and proceeds to manage necessary repairs. 7. Use case ends.
[NOV-5] Failure of Runway Condition Inference Function without Loss of Tower Communication / Issue with Input Quality / Data Source Loss	**Abstract** This Use Case describes the sequence of events in case one or more of the following non-nominal conditions occur: - Loss of RCAMS inference function (e.g. due to critical input failure), but dissemination function is active. - One or more RCAMS data sources are disabled (without significant bearing on the quality of Runway Condition inference) - An issue with a data quality occurs that is persistent – hence equivalent to data source loss.

	Actors - Duty Officer - RCAMS System Admin - RCAMS Data Supplier: o OBACS data handler o Local MET Data Provider o Local ANSP Assumptions - RCAMS is installed and running on an airport - The roles of RCAMS System Admin is defined in Airport Operator organisation - Airport Operator has means to contact any of the Data Suppliers on a short notice Pre-conditions N/A Triggering event RCAMS detects input data issue (either a connection issue or a QC failure) Use Case Steps 1. RCAMS informs operator (Duty Officer) of data source failure advising them that the system is still operational. 2. RCAMS System Administrator is advised of the issue. 3. RCAMS System Administrator investigates the issue and if necessary contacts RCAMS Data Supplier 4. The operation of the system continues as in Use Case PJ.02-W2-25-1 Alternative flow 1. This alternative flow is used in case when RCAMS main functionality – runway condition inference has been disabled but RCAMS secondary functionality (RCR dissemination) is operational. 2. RCAMS informs operator (Duty Officer) of primary function failure advising them that the dissemination sub-system is still operational. 3. RCAMS System Administrator is advised of the issue. 4. RCAMS System Administrator investigates the issue and if necessary contacts RCAMS Data Supplier 5. Airport operator continues operation as outlined by GRF but uses RCAMS only for dissemination.
[NOV-5] Transition from GRF to Solution Working Method	Abstract This Use Case describes the sequence of events occurring in two cases: either when the Solution is first deployed on the airport or final stages of recovery from general failure of RCAMS system to provide service. Actors

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	- Duty Officer - RCAMS System Admin - Tower Controller Assumptions - RCAMS is installed on an airport and fully functional - The roles of RCAMS System Admin is defined in Airport Operator organisation Pre-conditions RCAMS System Admin has completed successfully RCAMS set-up testing and diagnostics procedures Triggering event - RCAMS System Admin notifies Duty Officer that RCAMS is operational and ready to use - Duty officer acknowledges dedicated RCAMS message via HMI Use Case Steps 1. Duty Officer notifies Tower Controller that RCAMS is now operational 2. Use case ends.
[NOV-5] Elaborate Runway Condition Report	Abstract This use case describes the sequence of events occurring when contamination of the runway changes significantly whatever the initial condition. Automatic runway surface condition assessment performed continuously uses various data sources: automatic Surface Condition Sensors entries, weather data and forecast from MET Services. The aim of continuous runway surface condition assessment is to compute a Current RWYCC and a Predicted RWYCC. Surface Condition. This serves to maintain a degree of the runway condition awareness in-between two visual observations. It also permits to trigger a new visual inspection if condition change or are about to change shortly. Broadcasted Computed Braking Action is presented separately to the DO whenever available. In the following description, Current RWYCC and Predicted RWYCC are computed by RCAMS, which mainly covers AO-0216 of the PJ.02-W2-25.1 Solution. The DO always has to validate the computed Current RWYCC and Predicted RWYCC, based on manual inspection or other significant information, before further dissemination. Actors - Airport Operator, - Flight Crew (several), - Tower Runway Controller, - Tower Ground Controller. Assumptions

	- RCAMS offers a means for Local ATS (Tower) and Airport Operator to share runway condition information.
	- The Flight Crew may be assisted by an on-board system providing Braking Action assessment (OBACS).
	Pre-conditions
	- Current RWYCC and Predicted RWYCC values exist
	Triggering event
	- New ground data (Runway contaminant type and depth) is measured or observed:
	- OBACS output is received (requires A/C-84a , A/C-64, AIRPORT-59).
	- Originating from calibrated, accurate built-in runway sensors if such sensors are available on the runway,
	- Or through visual inspection and measurement. Visual measurement can be used in case of unavailability of entries from such sensors. Note: Runway contaminant nature and depth shall be periodically assessed by the Airport Operator and especially in adverse condition. As a result, the following events are a triggering events for this use case:
	- After a weather event which may have changed the runway condition status,
	- After decontamination or reopening, as runway condition status shall be re-assessed.
	- OBACS output is received (requires A/C-84a, A/C-64, AIRPORT-57 and AIRPORT-59).
	- MET Weather Short Forecast update is received (METEO-03c, METEO-04c).
	Nominal Flow
	1. The runway condition is automatically assessed:
	- Current Runway Condition is regularly computed,
	- Predicted Runway Condition is regularly computed,
	Data is continuously provided by automatic Surface Condition sensors AIRPORT-57 or (optionally) by visual inspection from the Airport Operator. MET is continuously provided.
	(optionally) Braking Action is provided:
	- Manually: when a Flight Crew of a just landed aircraft reports Braking Action, the Tower Runway Controller or the Tower Ground Controller report to the Airport Operator who then enters the Braking Action reported in the RCAMS;
	- Or automatically: computed braking action provided by equipped aircraft (A/C-64, A/C-84a, AIRPORT-59,).
	2. On any ground data or MET update (METEO-03c, METEO-04c) or new data given by Weather based RWYCC prediction model, the RCAMS re-evaluates a Predicted RWYCC based on last ground data or Braking Action received, Current RWYCC, and last Predicted RWYCC time series,
	3. New computed Runway Condition is compared to currently published RCR. Alerts are raised in case of differences.

	4. Airport Operator can decide on runway inspection. Runway closure is then coordinated with Tower. Runway inspection result is used in this case to validate RCAMS alerts. 5. In case RCAMS alert is correct, or any other significant discrepancy between the published RCR and current situation on the runway exists, Airport Operator, within its Duty Officer role, initiates the RCR update process. Otherwise, Runway Condition monitoring continues. Note: this use case only covers determination of the Current and Predicted Runway Condition. Any use and reporting are covered by other use cases. Post-conditions RCAMS maintains Current RWYCC, current runway condition and Predicted RWYCC, predicted runway condition, Airport Operator's awareness. Runway condition information is instantaneously disseminated and available to any stakeholder local to the airport who is connected directly to the RCAMS system (e.g. Tower Controllers, APOC, etc.).
[NOV-5] Decontamination execution	Abstract Runway decontamination operation is only changed by the Solution by the RCAMS provision of continuous runway condition and its very short term forecast which can be used to optimize the timing of the operation. RCAMS provides runway maintenance teams with direct access to synthetic information about runway condition and its near term forecast allowing for more precise planning of maintenance actions. This use case on the operational level is similar to the normal operations. The main change is introduced on the technical level. Actors - Airport Operator - Duty Officer - Winter Services Team - Tower Runway Controller - Tower Ground Controller Assumptions Winter Services Team is connected to limited RCAMS HMI offering live view of Duty Officer HMI. Pre-conditions Under Airport Operator control, the RCAMS has computed the Current RWYCC and Predicted RWYCC. Triggering event A significant negative change in runway condition is imminent or has just occurred.

	Nominal Flow 1. Using instantaneous information availability Winter Services team makes assessment of the (imminent or just occurred) change in runway condition and decides on necessary maintenance actions. Duty Officer may also initiate the maintenance actions by requesting some part of the airport paved surfaces to be cleared. 2. All agreed maintenance actions requiring runway closure or temporary taxiway unavailability are coordinated with the Control Tower. 3. Winter Services Team executes maintenance actions. 4. Duty Officer makes runway condition assessment according to UC PJ.02-W2-25-1 5. Winter Services team takes into account the information passed by the Duty Officer and assesses the need to repeat maintenance. If the need is assessed positively use case is restarted. 6. End Use Case. Post-conditions All maintenance actions are completed. Winter services Team Goes back to runway monitoring.
[NOV-5] Runway Condition Dissemination	Abstract This use case describes the actions and behaviour of the Airport Operator, Local ATS and AIS to disseminate runway condition to end users. Some consideration needs to be given to the issue of SNOWTAM creation based on RCR. The exact roles of Airport Operator and AIS are not always very precisely defined in the regulations and some local differences may arise. Care should be taken in this regard when implementing this solution. Under Airport Operator control, RCAMS can then transmit the RCR equivalent: - To the APOC for any update of the AOP (Airport Operation Plan) - To the local ATS - To the AIS At the same time RCR equivalent can be transmitted to: - To the Flight Crew of the aircraft which is about to start or to arrive at the airport, provided Flight Crew has access to SWIM service - To ATS other than local - To the AOC RCR dissemination function is SWIM compliant and uses Information Service developed in frame of SESAR PJ.18-04b. Actors - Airport Operator, - Flight Crew,

	- Tower Runway Controller, - Executive Approach Controller, - Tower Supervisor, - APOC, - AOC. **Assumptions** Under Airport Operator control, the RCAMS has computed the Current RWYCC and Predicted RWYCC, and offers means for Airport Operator to share that information. **Pre-conditions** Runway condition is made available to Airport Operator by RCAMS. Airport Operator has undertaken steps to validate it. **Triggering event** Runway condition has changed significantly with respect to last published RCR. **Nominal Flow** 1. Airport Operator, within its Duty Officer responsibilities, verifies contents of RCR and supplements it with any additional information according to RCR definition in (the best reference please). 2. Airport Operator, within its Duty Officer responsibilities, validates the RCR content and activates the RCR dissemination. 3. RCAMS disseminates the RCR locally via automatic means, to: - APOC. In addition, if RCR contains information about snow, slush, standing water, ice or frost it is disseminated to AIS for subsequent SNOWTAM publication. In parallel the RCR is published via SWIM service available via subscriptions to: - Flight Crew, - Non local ATS (e.g. Executive Approach Controller), - AOC. 4. In case of change, especially sudden or unexpected, new runway condition is highlighted to strengthen Air Traffic Controllers awareness; if necessary, the Airport Operator may contact directly the Tower Runway Controller or the Tower Supervision Controller. 5. Tower Supervisor Controller broadcasts the information on runway condition via ATIS, and informs the Tower Runway Controller of the new runway condition. 6. If necessary, the Tower Runway Controller relays the information of the new runway condition to the Executive Approach Controller.

	7. Flight crew retrieves runway condition information and use it to monitor take-off or landing, using ROAAS and TOMS when available. Post-conditions RCR supplemented with runway condition expected trend information is provided to end users. This action is achieved locally using local RCAMS service and non-locally via dedicated SWIM service developed by PJ.18-04b.

Table 5 : PJ.02-W2-25.1 Solution Overview - Relevant Use Cases

System Process	Description
[NSV-4] Enabling of RCAMS Inference Function	
[NSV-4] Enabling of RCAMS Local Dissemination Function	
[NSV-4] Failure of RCAMS Inference Function	This NSV-4 diagram details the following diagram(s): - [NOV-5] Failure of Runway Condition inference function without loss of Tower communication/ Persistent issue with input quality / Data source loss - [NOV-5] General failure of RCAMS system to provide service
[NSV-4] Failure of RCAMS Local Dissemination Function	
[NSV-4] Landing Preparation, Descent and Landing Roll	Flight operating on aircraft ROAAS equipped are provided with Runway Excursion risk alert from descent preparation, approach and landing roll. This view describes the landing preparation and descent phases, linked to the following Uses Cases described in PJ_02-W2-25 INTEROP/OSED : - PJ.02-W2-25-2-0: Runway Condition dissemination Landing preparation is affected by runway contamination condition: do runway still complies with landing performance assessment at estimated time of landing, effected at time of dispatch? ROAAS may alert Flight Crew when a risk of Runway Excursion occurs, following EUROCAE ED-250 specification in its basic implementation, possibly amended by a Certification Review item from Airworthiness Authorities. According to PJ.02-W2-25-2-0 use case Runway Condition dissemination, the arriving aircraft can receive runway condition by : - Configuration Capability Control Tower by ATIS or R/T - Configuration Capability Airport Operations by SWIM RCR - Configuration Capability Approach ATS by R/T

	Runway condition can be updated at any time by the airport (following the validation of a new runway condition to be disseminated by the Airport Duty Officer) and before landing ROAAS should then be updated with the new expected runway condition at the time of landing.
[NSV-4] Loss of RCAMS Data Source	
[NSV-4] Runway Clearance from any Winter Contaminant	This view describes the Resources Connectivity for Solution PJ.02-W2-25.1 and includes the realization of SPR-INTEROP/OSED Use Cases: - PJ.02-W2-25-2-5: Decontamination execution All runway operations are managed by the Airport Duty Officer who is responsible of the Airport Snow and Ice Clearance Plan implementation. The Winter Service team, in coordination with the airport duty officer is in charge of clearing runways and taxiways from any winter contaminant. This view describes the decision and execution process of winter runway maintenance operation (chemical treatment or snow removal).
[NSV-4] Runway Condition Dissemination	This view describes the landing preparation and descent phases, linked to the following Uses Cases described in PJ_02-W2-25 INTEROP/OSED : - PJ.02-W2-25-2-0: Runway Condition dissemination Runway maintenance is under Airport Operator responsibility. Dissemination of runway surface condition information is manually triggered by Airport Duty Officer. This view describes the dissemination process of runway condition following manual validation of Airport Duty Officer.
[NSV-4] Runway Condition Report Elaboration	This NSV-4 functionality description diagram details the NOV-5 Elaborate Runway Friction Status diagram. This view describes the runway condition elaboration process where a complete configuration applies (RCC-4 here below). But configuration may be partial: - RCC-1 Runway condition awareness management system (RCAMS) based on manual assessment of contamination, weather information and runway sensors, - RCC-2 RCAMS in RCC-1 conf completed by Surveillance input data to assess runway condition, - RCC-3 RCAMS RCC-1 configuration completed by OBACS input, - RCC-4 RCAMS RCC-2 configuration completed by OBACS input.

Table 6 : PJ.02-W2-25.1 Solution Overview - System Process

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3.1.1.3 Applicable standards and regulations

This section identifies the list of standards and regulations that are applicable to the SESAR Solution PJ.02-W2-25.1. RCAMS developed in current SESAR Solution is expected to be a support for the airport authority to comply with the new requirements of the Global Reporting Format, transcript in EASA Notice of Proposed Amendment (NPA) 2018-14 [60]

Applicable standards and regulations	EASA Notice of Proposed Amendment (NPA) 2016-11
	EASA Notice of Proposed Amendment (NPA) 2018-14
	EU 2019/1387
	EU 2020/469
	EU 2020/767
	EU 2020/1176
	EASA Notice of Proposed Amendment (NPA) 2018-12
	EUROCAE ED-250
	EUROCAE WG-109 ED-292
	ICAO Annex 6, Part I
	ICAO Annex 8
	ICAO Annex 14, Vol1
	ICAO Annex 15
	ICAO Doc 4444
	ICAO Doc 9881
	ICAO Circular 355
	ICAO Doc 10066
	ICAO EUR NAT
	ICAO Doc 10064 (Aeroplane Performance Manual)

Table 7 : PJ.02-W2-25.1 Solution Overview - Applicable standards and regulations

EASA

- EASA NPA 2016-11 (Review of aeroplane performance requirements for commercial air transport operations) [70] proposes standards for runway surface condition reporting, airworthiness standards for landing performance computation at time of arrival, an in-flight assessment of landing performance at time of arrival as well as a reduced required landing distance for business aviation operations with performance class A aeroplanes and for performance class B aeroplanes operations.
- EASA NPA 2018-14 (Runway Safety) [60]. The objective of this NPA is to mitigate the safety risks associated with runway safety, from an aerodrome's perspective, focusing mainly on the prevention of runway incursions and on runway surface condition assessment and reporting, but also addressing issues such as ground collisions, runway confusion, foreign object debris (FOD)-related occurrences as well as runway pavements' maintenance.
- GRF implementation in EU:

  o EU 2019/1387 239[62] amending Commission Regulation N° 965/2012 AIR OPERATIONS.
  o EU 2020/469 [63] amending Commission Regulation N° 923/2012 SERA.

- o EU 2020/767 [64] amending Commission Regulations N° 2019/1387 and 2020/469: 6 months shift from 5 November 2020.
- o EU 2020/1176 [65] amending Commission Regulation N° 2019/1387: applicability set to 12 August 2021.

- EASA Notice of Proposed Amendment (NPA) 2018-12 - The objective of this NPA is to address the safety issue of runway excursions that occur during landings. This NPA proposes to require the installation of a runway overrun awareness and alerting system on new large aeroplane designs (CS-25), and on certain new large aeroplanes operated in commercial air transportation (CAT), and manufactured after a predetermined date (Part-26/CS-26). The proposed regulatory changes are expected to increase safety by supporting the flight crew during the landing phase in identifying and managing the risk of a runway excursion. This should reduce the number of runway excursions that occur during landings. [71]

EUROCAE

- ED-250 – Minimum Operational Performance Standard for a Runway Overrun Awareness And Alerting System [59]
- EUROCAE working group (WG109 – Runway Weather Information Systems - RWIS) conducts a standardization activity to draw up ED-292 MASPS (Minimum Aviation System Performance Standards) that defines the performances expected from the systems and the way of verifying that the latter reach them.

ICAO

- International Standards and Recommended Practices, Operation of Aircraft (Annex 6 to the Convention on International Civil Aviation, Part I Operation of Aircraft – International Commercial Air Transport - Aeroplanes) [47].
- International Standards and Recommended Practices, Airworthiness of Aircraft (Annex 8 to the Convention on International Civil Aviation) [48].
- International Standards and Recommended Practices, Aerodromes — Aerodrome Design and Operations (Annex 14, Volume I to the Convention on International Civil Aviation) [49].
- International Standards and Recommended Practices, Aeronautical Information Services (Annex 15 to the Convention on International Civil Aviation) [57].
- Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM), ICAO Doc 4444 [66]
- Procedures for Air Navigation Services — Aerodromes (PANS-Aerodromes, Doc 9981): The TALPA ARC proposals is available in ICAO Doc 9981 [44]
- Guidance: Circular 355 [58] (detailed procedures for generating condition reports are available in the PANS-Aerodromes. This is revised Circular 329 [46] with updated guidance material and the new Aeroplane Performance Manual).
- Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066): Harmonization of AIS/AIM procedures; and SNOWTAM format. From the Solution perspective, important part of the document is: Appendix 4. SNOWTAM format in ICAO Doc 10066 [67]
- ICAO EUR NAT: Guidance on the Issuance of SNOWTAM [68]
- ICAO Doc 10064 Aeroplane Performance Manual. This manual was developed to combine guidelines on certification and operational requirements regarding aeroplane performance. It was developed in the context of the Friction Task Force of the Aerodrome Operations and Services Working Group on the basis of existing and proposed national regulations, Annex 6 Attachment C

and the proposals of the FAA Take-off and Landing Performance Aviation Rulemaking Committee (TALPA ARC). [69]

- International Civil Organization (ICAO) State Letters AN 10/1.1, AN 11/1.3.33, AN 11/6.3.32, AN 3/5.13, AN 4/1.2.29, AN 2/2.7, AN 13/2.1, AN 4/27 and AN 2/33-20/73 – Amendments 45 to Annex 6, Part I; 107 to Annex 8; 16 to Annex 14, Volume I; 42 to Annex 15; 10 to PANS-ATM (ICAO Doc 4444); 4 to PANS-Aerodromes (ICAO Doc 9981); and 2 to PANS-AIM (ICAO Doc 10066): applicabilty set to 4 November 2021.
- International Civil Aviation Organization (ICAO) State Letters 2016/12 and 2016/29
- ICAO Vision on use of PIREP for Runway Surface Condition Reporting.

FAA

As related applicable or coming standard/regulations, the following ones may be named:

- AC91-79A: Mitigating the Risks of a Runway Overrun Upon Landing [51],
- AC 150/5200-30D: Airport Field Condition Assessments and Winter Operations Safety
- Mention in AC 150/5200-28F - Notices to Airmen (NOTAMs) for Airport Operators
- AC25-32: Landing Performance Data for Time-of-Arrival Landing Performance Assessments [52].

TALPA ARC group submitted its proposals for changes to FAA regulation in May 2009. TALPA proposals have been integrated into a series of advisory documents. Safety Alert For Operators 16009 list the main sources relevant to airlines, while guidance for manufacturers and airports is the object of several Advisory Circulars (part 25 for certification, and part 150 for airports).

3.1.2 Capability Configurations required for the SESAR Solution

Runway Condition Report Elaboration			Airport	
CC	Op Env	Capability	Node	Stakeholder
Aerodrome ATM-MET (PJ02-W2-25)	Airport;	Meteorological Observation and Forecasting Provision;	Meteorological Service Provision;	Airport Operator; Civil MET Service Provider; Civil MET Service Provider; Military MET Service Provider.
Airport (PJ02-W2-25)	Airport;	Runway Excursion Avoidance; Surface Condition Awareness;	Airport Ops Support; Airport Vehicle	Civil APT operator; Military APT operator

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Airport Data Service Provider	Airport;	Surface Condition Awareness;	Data Integrator	
Civil and Military Aircraft (PJ02-W2-25)	Airport;	Runway Excursion Avoidance; Surface Condition Awareness;	Flight Deck;	Civil Business Aviation-Fixed Wing; Civil Business Aviation-Rotorcraft; Civil Scheduled Aviation.
Communication Infrastructure	Airport; En-Route; Network; Terminal Airspace;			Civil CNS Service Provider; Military CNS Service Provider.
Surveillance Infrastructure Airport (PJ02-W2-25)	Airport;	Detection/Tracking of Mobiles (surface) from Composite Surveillance and/or Alternative Sources;	Aerodrome ATS;	Civil CNS Service Provider; Military CNS Service Provider.
TWR (PJ02-W2-25)	Airport;	Surface Condition Awareness;	Aerodrome ATS;	Civil ATS Aerodrome Service Provider; Military ATS Aerodrome Service Provider.

Table 8 : PJ.02-W2-25.1 Solution Overview - Capability Configuration for Runway Friction Status Elaboration

Runway Condition Information Use			Airport	
CC	Op Env	Capability	Node	Stakeholder

Airport (PJ02-W2-25)	Airport;	Runway Excursion Avoidance; Surface Condition Awareness;	Airport Ops Support; Airport Vehicle;	Civil APT operator; Military APT operator.
Civil and Military Aircraft (PJ02-W2-25)	Airport;	Runway Excursion Avoidance; Surface Condition Awareness;	Flight Deck;	Civil Business Aviation-Fixed Wing; Civil Business Aviation-Rotorcraft; Civil Scheduled Aviation.
Civil and State AU Operations Centre (PJ02-W2-25)	Airport;	Surface Condition Awareness;	Airspace User Ops Support;	Airspace User; Civil Flight Operations Centre.
Communication Infrastructure	Airport; En-Route; Network; Terminal Airspace.			Civil CNS Service Provider; Military CNS Service Provider.
Regional AIM (PJ02-W2-25)	Airport; En-Route; Network; Terminal Airspace.	Surface Condition Awareness;	Aeronautical Information Service Provision.	Network Manager.
TWR (PJ02-W2-25)	Airport;	Surface Condition Awareness;	Aerodrome ATS;	Civil ATS Aerodrome Service Provider; Military ATS Aerodrome Service Provider.

Table 9 PJ.02-W2-25.1 Solution Overview - Capability Configuration for Runway Friction Status Use

RCAMS Non-nominal and Transition Connectivity	Airport

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CC	Op Env	Capability	Node	Stakeholder
Airport (PJ02-W2-25)	Airport;	Runway Excursion Avoidance; Surface Condition Awareness;	Airport Ops Support; Airport Vehicle.	Civil APT operator; Military APT operator.
Communication Infrastructure	Airport; En-Route; Network; Terminal Airspace;			Civil CNS Service Provider; Military CNS Service Provider.
TWR (PJ02-W2-25)	Airport;	Surface Condition Awareness;	Aerodrome ATS;	Civil ATS Aerodrome Service Provider; Military ATS Aerodrome Service Provider.

Table 10 : PJ.02-W2-25.1 Solution Overview – Capability Configuration for RCAMS non-nominal and transition connectivity

3.1.2.1 Aerodrome ATM-MET (PJ.03b-06)

Implemented by designated MET service providers. The Aerodrome ATM MET CC of an aerodrome provides services to address the ICAO obligation for MET service provision for aviation (METAR, etc.).

This CC also delivers data services necessary for enhanced Surface Condition Awareness. Those services include access to AWOS data in real time, provision of numerical weather forecasts and weather radar imagery.

3.1.2.2 Airport (PJ.03b-06)

Implemented by the civil and military Airport Operator at the airport to manage the airside operations that interface with the ATM at the airport (e.g. runway closure coordination needed for runway inspection or runway maintenance).

3.1.2.3 Civil and Military Aircraft (PJ.03b-06)

Reflects the generic implementation of the Aircraft Technical System by a Civil Airspace User to perform its operations in the Air or on the APRON / Runway / Taxiway.

In the context of the Solution (Runway Excursion avoidance), any kind of aircraft is concerned: civil, military, RPAS.

Runway condition is to consider for take-off and landing performance assessment, and to set-up ROAAS. Braking Action reported by PIREP / Computed Braking Action (if OBACS equipped)

automatically computed and transmitted to Airport are used by Airport to consolidated runway condition assessment.

3.1.2.4 TWR (PJ.03b-06)

Implemented by the civil and military ATS ANSP in an Air Traffic Control Tower at an aerodrome to forward Civil Aircraft and Military Aircraft runway condition for take-off and landing performance assessment (same role is devoted to En-Route ACC and APP ACC).

Control Tower ATS ANSP is also in charge of runway closure coordination, following Airport request (runway inspection or maintenance needed).

3.1.2.5 Surveillance Infrastructure Airport (PJ02-W2-25)

Implemented by Surveillance Service providers for Airport and consists of sensors and any other technical systems to ensure that A/C position, identity and other aircraft parameters are available to the ground systems. This data eventually were proved to be unnecessary for this concept.

3.1.2.6 REGIONAL AIM (PJ.02-W2-25.1)

Implemented by the AIS Service Provider this CC is tasked with delivering the usual AIS information (NOTAM, SNOWTAM, etc.) to Airspace Users.

No change should concern this CC, which is listed here only because AIM is a consumer of information necessary for publishing SNOWTAM. As a result, this CC is treated as a black-box in the present document.

3.1.2.7 Civil and State AU Operations Centre (PJ.03b-06)

Implemented by Civil Airspace Users realizing manned or unmanned flight operations of civil aircraft (as defined by ICAO).

In the context of the Solution (Runway Excursion avoidance), any kind of operation is concerned: civil, military, RPAS, which now integrate runway condition provided by airport.

3.2 Changes imposed by the SESAR Solution on the baseline Architecture

Enabler	Element type	Element name	Impact	Change

A/C-64	Data transmission means supporting downlinked observed runway surface condition (aircraft side)			
	Function	Aircraft Computed Braking Action Dissemination	Introduce	
A/C-84 (CR)	Braking action computation function in On-board Braking Action Computation System (OBACS)			
	Function	Compute Braking Action	Introduce	OBACS introduction to provide Airport with on-board computed friction measurement at landing (Braking Action which can be measured when friction was limited during braking - anti-skid activated)
	Function	Display Computed Braking Action	Introduce	OBACS introduction to provide Airport with on-board computed friction measurement at landing (Braking Action which can be measured when friction was limited during braking - anti-skid activated)
AIRPORT-57 (CR)	Runway condition awareness management system based on manual assessment, weather information and runway sensors + PIREP + machine-learning based RWY condition model and predictions			
	Sys	Runway Condition Awareness and Monitoring System	Introduce	
AIRPORT-59 (CR)	Airport ATC Subsystem (RCAMS) updated to integrate aircraft observed runway braking action into runway condition information			
	Function	Display Alert on Aircraft Braking Action Reception	Introduce	(see Function description)
	Function	Parse OBACS Data	Introduce	(see Function description)
SVC-061 (create CR)	Runway condition report service			
	Service	RunwayConditionReport		
SVC-071 (create CR)	Runway Braking Action service			
	Service	RunwayBrakingAction		

Table 11 : PJ.02-W2-25.1 Changes on the baseline's Architecture

4 Technical Specifications

4.1 Functional architecture overview (general introduction)

Role	Functional Block	Function
[NSV-4] Enabling of RCAMS Inference Function		
Airport Duty Officer (PJ02-W2-25)		Acknowledge RCAMS Monitoring Readiness; Confirm RCAMS Inference Activation.
RCAMS Administrator		Acknowledge RCAMS Activation; Coordinate RCAMS Inference Setup; Initiate RCAMS Inference;
	RCAMS HMI	Display RCAMS Inference Active.
	RCAMS Inference	Broadcast RCAMS Inference Active; Switch On Inference.
[NSV-4] Enabling of RCAMS Local Dissemination Function		
Airport Duty Officer (PJ02-W2-25)		Acknowledge Local Dissemination Readiness; Confirm RCAMS Local Dissemination Initiation; Coordinate Local Dissemination Initiation; Start Regular Usage of RCAMS Local Dissemination.
	Controller Human Machine Interaction Management Aerodrome ATC (PJ02-W2-25)	Display Local Dissemination On-Line.
RCAMS Administrator		Coordinate Airport RCAMS Startup.
	RCAMS Data Dissemination	Broadcast Message Local Dissemination On-Line; Switch On Local Dissemination.
	RCAMS HMI	Display Local Dissemination On-Line.
[NSV-4] Failure of RCAMS Inference Function		
Airport Duty Officer (PJ02-W2-25)		Initiate Repairs Coordination; Monitor Runway Condition Manually; Switch to Manual Runway Condition.

RCAMS Administrator		Initiate RCAMS Emergency Maintenance.
	RCAMS HMI	Display Inference Loss Alert.
	RCAMS Inference	Broadcast Error Message to Endpoints.
[NSV-4] Failure of RCAMS Local Dissemination Function		
Airport Duty Officer (PJ02-W2-25)		Establish Fallback Runway Condition Transmission; Initiate Repairs Coordination.
	Controller Human Machine Interaction Management Aerodrome ATC (PJ02-W2-25)	Display RCR Reception Loss Alert.
RCAMS Administrator		Initiate RCAMS Emergency Maintenance.
	RCAMS Data Dissemination	Broadcast Error Message.
	RCAMS HMI	Display Local Dissemination Loss Alert.
Tower Runway Controller (PJ02-W2-25)		Acknowledge Runway Fallback Communication.
[NSV-4] Loss of RCAMS Data Source		
Airport Duty Officer (PJ02-W2-25)		Initiate Repairs Coordination.
RCAMS Administrator		Initiate RCAMS Emergency Maintenance.
	RCAMS Data Acquisition	Broadcast Loss of Data Warning.
	RCAMS HMI	Display Critical Data Loss Alert; Display Data Loss Warning.
	RCAMS Inference	Broadcast Critical Data Loss Alert; Estimate Data Source Loss Influence on Quality.
[NSV-4] Landing Preparation, Descent and Landing Roll		
	Alerts (PJ02-W2-25)	Provide ROAAS Alert.
	Displays and Controls (PJ02-W2-25)	Capture ROAAS Setup Parameters; Display ROAAS Indicators.

Flight Crew (PJ02-W2-25)		Monitor Aircraft Stopping Capability; Prepare and Brief Expected Approach and Landing; ROAAS Setup.
	Runway Overrun Awareness and Alerting (PJ02-W2-25)	Assess Aircraft Stopping Capability from DH to Stopping Point.
[NSV-4] Runway Clearance from any Winter Contaminant		
Airport Duty Officer (PJ02-W2-25)		Asses Runway Maintenance Needs; Confirm Significant Change of RWY Conditions; Monitor Runway Condition; Request Runway Closure slot for Runway Maintenance.
Airport Tower Supervisor (PJ02-W2-25)		Plan Runway Closure.
Airport Winter Service Team		Perform Runway Decontamination.
	RCAMS HMI	Display Relevant Data Related to RWY Conditions.
[NSV-4] Runway Condition Dissemination		
Airport Duty Officer (PJ02-W2-25)		Confirm Significant Change of RWY Conditions; Prepare RCR; Provide SNOWTAM to AIS; Validate RCR Dissemination.
Airport Tower Supervisor (PJ02-W2-25)		ATIS Update and Publication.
	Controller Human Machine Interaction Management Aerodrome ATC (PJ02-W2-25)	Alert on New RCR; Display RCR.
	RCAMS Data Dissemination	Disseminate RCR Externally; Disseminate RCR Locally; Disseminate SNOWTAM to AIS.
	RCAMS HMI	Display RCR; Initiate RCR Dissemination; Initiate SNOWTAM Dissemination; RCR Input.
Tower Runway Controller (PJ02-W2-25)		Communicate Runway Conditions.

[NSV-4] Runway Condition Report Elaboration		
	Airport Data Processing	Parse OBACS Data.
Airport Duty Officer (PJ02-W2-25)		Asses Runway Maintenance Needs; Coordinate Runway Inspection; Monitor Runway Condition; Prepare RCR; Receive Runway Inspection Results; Request Runway Closure Slot for Inspection.
Airport Runway Inspection Team		Perform Runway Inspection.
Airport Tower Supervisor (PJ02-W2-25)		PIREP Braking Action Dissemination; PIREP-Braking Action reception; Plan Runway Closure.
	Displays and Controls (PJ02-W2-25)	Display Computed Braking Action.
Flight Crew (PJ02-W2-25)		Braking Action Pilot Assessment; Communicate Braking Action.
	On-Board Braking Action Computation	Aircraft Computed Braking Action Dissemination; Compute Braking Action.
	RCAMS Data Acquisition	Monitor RCAMS Inputs; Pre-process RCAMS Input.
	RCAMS HMI	Compare Computed RWY Conditions to Published RWY Conditions; Display Alert on Aircraft Braking Action Reception; Display Alert on Significant Change of RWY Conditions; Display No Alert; Display Relevant Data Related to RWY Conditions.
	RCAMS Inference	Compare Computed RWY Conditions to Published RWY Conditions; Compute RWY Conditions.

Table 12 : Functional Architecture – Roles, Functional Blocks & Functions

4.1.1 Resource Connectivity view [NSV-1] – **Runway Condition Report Elaboration**

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This view summarizes the information exchanges used when elaborating the runway status in the SPR-INTEROP/OSED Use Case PJ.02-W2-25.1-1: Elaborate Runway Condition Report.

This view describes the Resources Connectivity for Solution PJ.02-W2-25.1 and includes the realization of SPR-INTEROP/OSED UC PJ.02-W2-25.1-1 Elaborate Runway Condition Report.
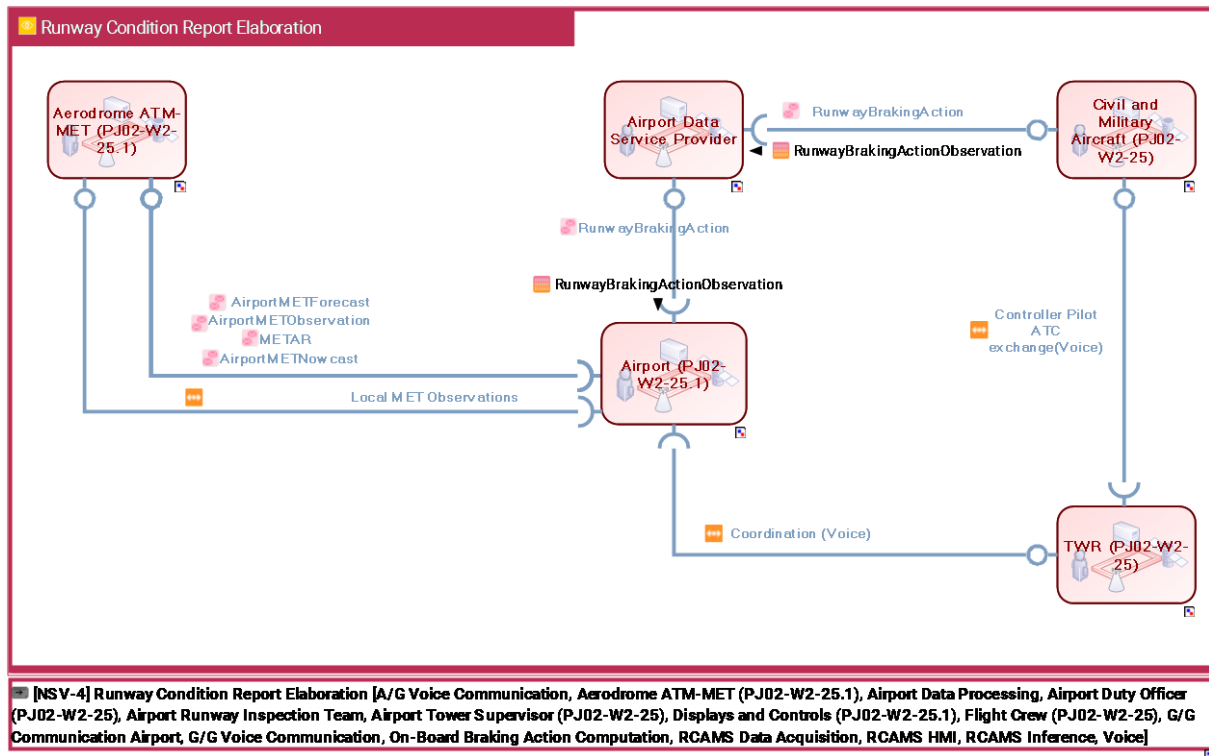
Figure 1 : [NSV-1] Resource Connectivity Model - **Runway Condition Report Elaboration**

4.1.1.1 Resource Infrastructure view [NSV-2] – **Runway Condition Report Elaboration**

This view describes the infrastructure connectivity diagram for the solution PJ.02-W2-25.1 and the realization of the use-case PJ.02-W2-25.1-1 Elaborate Runway Condition Report.

[NSV-4] Runway Condition Report Elaboration [A/G Voice Communication, Aerodrome ATM-MET (PJ02-W2-25.1), Airport Data Processing, Airport Duty Officer (PJ02-W2-25), Airport Runway Inspection Team, Airport Tower Supervisor (PJ02-W2-25), Displays and Controls (PJ02-W2-25.1), Flight Crew (PJ02-W2-25), G/G Communication Airport, G/G Voice Communication, On-Board Braking Action Computation, RCAMS Data Acquisition, RCAMS HMI, RCAMS Inference, Voice]

Figure 2 : [NSV-2] Infrastructure connectivity model - Runway Condition Report Elaboration

4.1.1.2 Resource Orchestration view [NSV-4] – Runway Condition Report Elaboration

This NSV-4 functionality description diagram details the NOV-5 Elaborate Runway Friction Status diagram.

This view describes the runway condition elaboration process where a complete configuration applies (RCC-4 here below). But configuration may be partial:

- RCC-1 Runway condition awareness management system (RCAMS) based on manual assessment of contamination, weather information and runway sensors,
- RCC-2 RCAMS in RCC-1 conf completed by Surveillance input data to assess runway condition,
- RCC-3 RCAMS RCC-1 configuration completed by OBACS input,
- RCC-4 RCAMS RCC-2 configuration completed by OBACS input.

Figure 3 : [NSV-4] Runway Condition Report Elaboration

New or modified functions have cyan background.

Function	Description
Aircraft Computed Braking Action Dissemination	Once computed, Braking Action is automatically sent to the airport to enhance Airport Duty Officer´s situational awareness and support decision making process (e.g. application of downgrade criteria), and displayed to Flight Crew when relevant to assist PiREP.
Asses Runway Maintenance Needs	Airport Duty Officer shall assess if significant change of runway conditions requires also runway maintenance.
Braking Action Pilot Assessment	Human assessment of experienced Braking action at landing, taking into account Aircraft Computed Braking Action when available.
Communicate Braking Action	Braking Action is reported by Flight Crew when runway condition experienced at landing was worse than expected.
Compare Computed RWY Conditions to Published RWY Conditions	Comparison of computed RWY conditions (by RCAMS Inference) with the last published RCR to detect change of runway conditions.
Compute Braking Action	Braking action computation associated with braking limitation information (friction limited braking or not).
Compute RWY Conditions	RCAMS inference to provide current and predicted runway conditions based on integration of all available RCAMS inputs (runway built-in sensors data, ground trajectory from surveillance data, MET observation and forecast).
Coordinate Runway Inspection	Airport Duty Officer, as responsible of all airside operations of the platform, coordinates Runway Inspection team activities.
Display Alert on Aircraft Braking Action Reception	Each received OBACS report with computed braking action from landed aircraft shall be displayed on RCAMS DUTY OFFICER HMI.
Display Alert on Significant Change of RWY Conditions	If RWY conditions changed significantly with respect to published RWY conditions (from the last RCR), RCAMS DUTY OFFICER HMI will display alert on significant change of runway conditions to attract Airport Duty Officer attention. The alert shall be active (e.g. blinking) until acknowledgment from Airport Duty Officer.
Display Computed Braking Action	When braking was limited and OBACS was able to compute the experienced Braking Action at landing, the result is made available for the Flight Crew, to support its own Braking Action assessment.

Display No Alert	If RCAMS and all RCAMS inputs work properly and computed runway conditions do not indicate any significant change, „No Alert" shall be displayed on RCAMS DUTY OFFICER HMI.
Display Relevant Data Related to RWY Conditions	RCAMS DUTY OFFICER HMI displays all relevant data related to RWY conditions. That includes valid RCR, outputs from RCAMS Inference (computed RWY conditions including RWYCC, contaminant coverage, type and depth and its short-term prediction) as well as some data from sensors (e.g. runway temperature, freezing point temperature, precipitation etc.).
Monitor RCAMS Inputs	All RCAMS inputs should be monitored. In case of any failure of an input link of data (loss of data source connection), this shall be detected by this monitoring function to report Airport Operator (Duty Officer) about the most probable degradation effects on the RCAMS assessment of Runway Condition to switch to respective non-nominal Use Case.

Part of the Technical Supervision, RCAMS monitoring gathers RCAMS input failures detected by the Monitoring RCAMS function and Runway Surface Condition consolidated from these different inputs to raise alerts to the Duty Officer.

Preliminary inputs quality check is also an important part of the monitoring process. |
Monitor Runway Condition	Duty Officer is responsible for runway condition assessment and reporting. Airport Duty Officer continuously monitors information on RCAMS DUTY OFFICER HMI, receives results from runway inspection, PIREPs and makes final assessment of runway conditions (e.g. confirmation or rejection of significant changed identified by RCAMS Inference or PIREP).
Parse OBACS Data	Airport Data Service Provider transfers to Airport RCAMS the OBACS data coming from Aircraft through datalink.
Perform Runway Inspection	Runway inspection is performed by the runway maintenance team managed by the Duty Officer, after coordination with the Control Tower.
PIREP Braking Action Dissemination	PIREP transmitted by voice from Tower Controller to Airport Operator.
PIREP-Braking Action reception	PIREP transmitted by voice to Tower Controller.

Airport Operator can also ask Tower to systematically ask for Braking Action report from pilots in adverse weather situation |

Plan Runway Closure	Airport traffic analysis; departure, arrival Tower controllers coordination, Approach controllers coordination; to define the runway closure slot which should fit to the airport operator needs (for runway inspection).
Prepare RCR	After Airport Duty Officer confirms significant change of runway conditions, he is responsible also to prepare new RCR reflecting this change.
Preprocess RCAMS Input	It consolidates data from all input sources to be further processed by RCAMS Inference and/or RCAMS HMIs.
Receive Runway Inspection Results	Runway inspection results are reported to Airport Duty Officer.
Request Runway Closure Slot for Inspection	Before any Airport Operator activity on the runway, Airport Duty Officer or activity's responsible person will need to coordinate runway closure with TWR.

Table 13 : NSV-4 Runway Condition Report Elaboration

4.1.2 Resource Connectivity view [NSV-1] – **Runway Condition Information Use**

This node view summarizes the information exchanges used when disseminating the runway status.

This view describes the Resources Connectivity for Solution PJ.02-W2-25.1 and includes the realization of SPR-INTEROP/OSED Use Cases:

- PJ.02-W2-25-2-0: Runway Condition dissemination

- PJ.02-W2-25-2-5: Decontamination execution
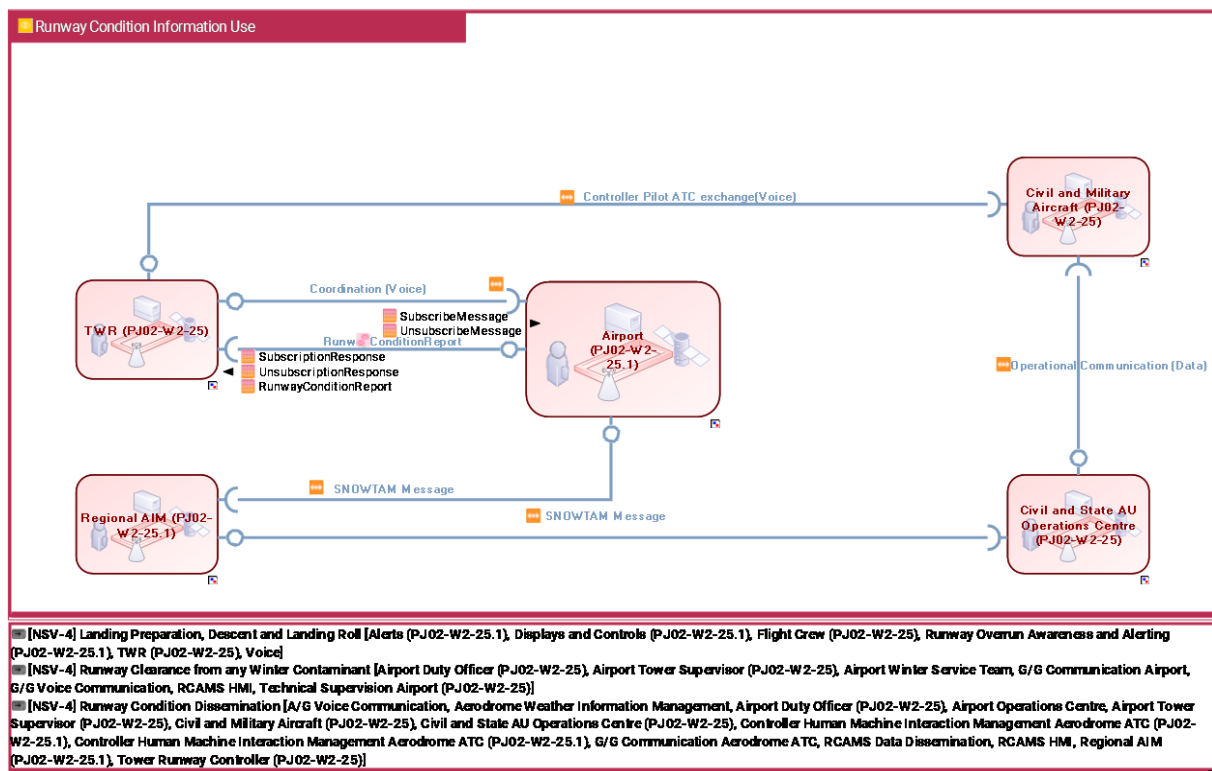
Figure 4 : [NSV-1] Resource Connectivity Model - Runway Condition Information Use

4.1.2.1 Resource Infrastructure view [NSV-2] – **Runway Condition Information Use**

This node view summarizes the information exchanges used when disseminating the runway status.
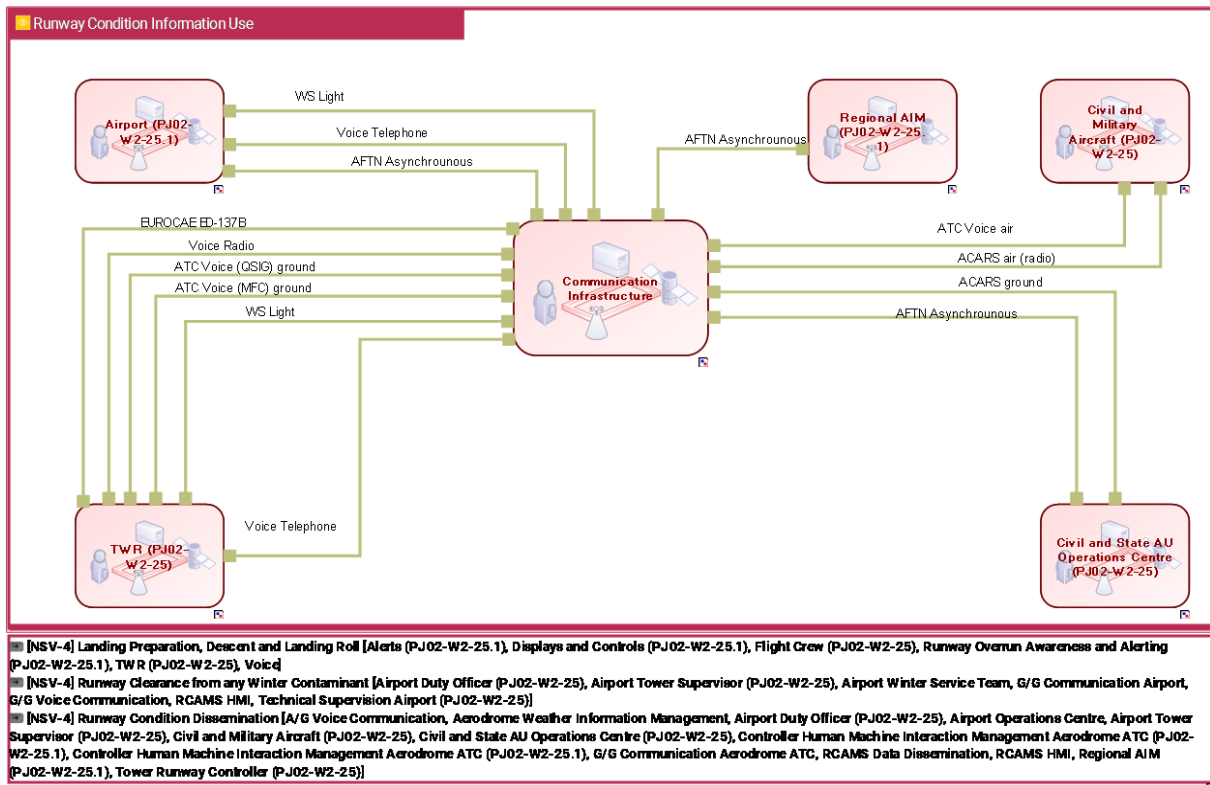
Figure 5 **: [NSV-2] Infrastructure connectivity model - Runway Condition Information Use**

4.1.2.2 Resource Orchestration views [NSV-4]s – **Runway Condition Information Use**

4.1.2.2.1 Resource Orchestration view - [NSV-4] Runway Condition Dissemination

This view describes the landing preparation and descent phases, linked to the following Uses Cases described in PJ_02-W2-25 INTEROP/OSED : PJ.02-W2-25-2-0: Runway Condition dissemination

Runway maintenance is under Airport Operator responsibility.

Dissemination of runway surface condition information is manually triggered by Airport Duty Officer. This view describes the dissemination process of runway condition following manual validation of Airport Duty Officer.

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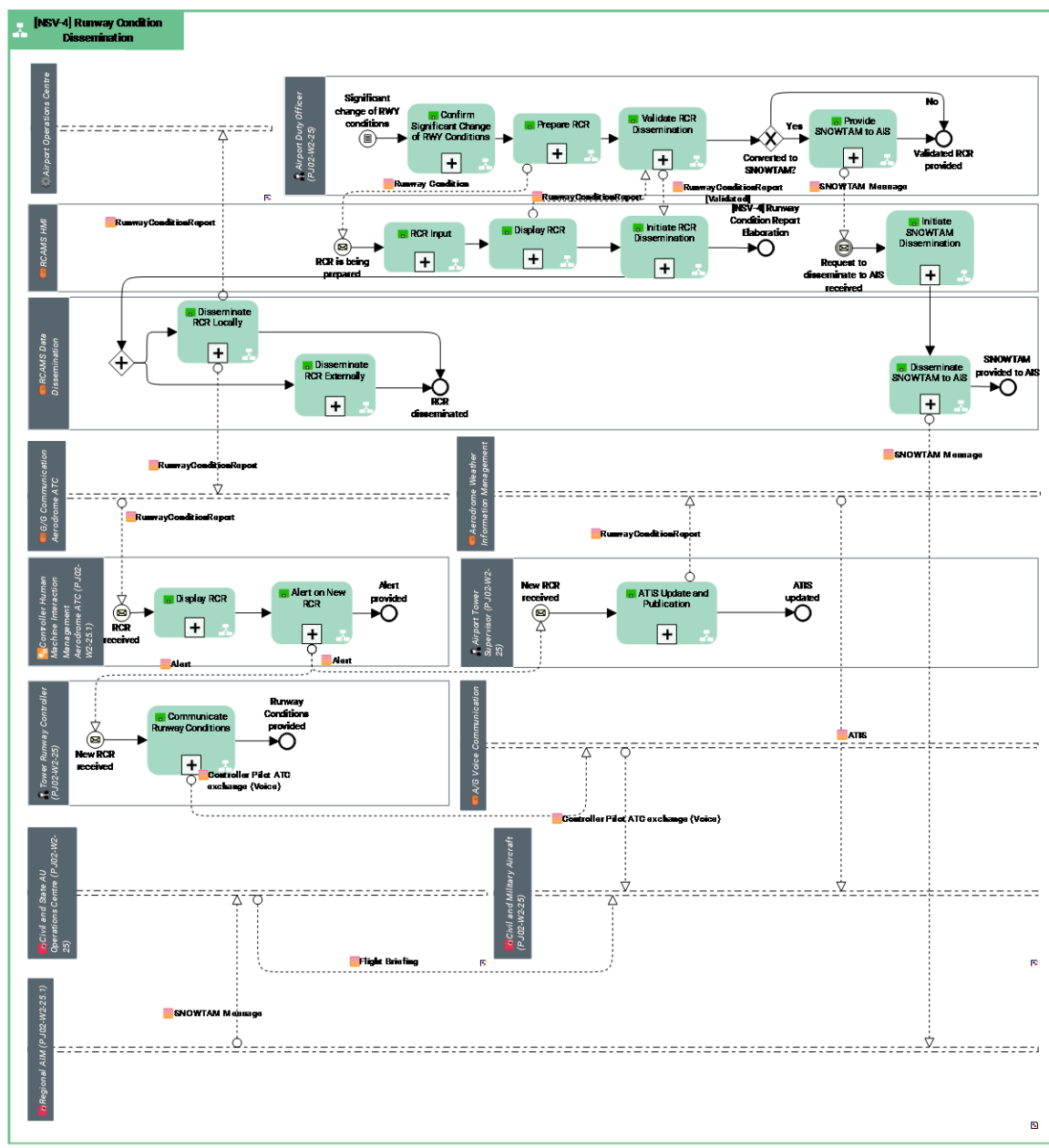
Figure 6 : [NSV-4] Runway Condition Dissemination

New or modified functions have cyan background.

Function	Description
Alert on New RCR	This Function displays an alert on new RCR to attract ATCO attention.
ATIS Update and Publication	ATIS / D-ATIS update on airport weather update, runway configuration update, runway condition update.

Communicate Runway Conditions	Runway conditions are transmitted by voice to Flight Crew.
Confirm Significant Change of RWY Conditions	Duty Officer is responsible for final confirmation of significant change of runway conditions identified by RCAMS Inference or PIREP.
Display RCR	This Function shall display the last RCR.
Disseminate RCR Externally	Dissemination of Runway Condition Report after Duty Officer validation outside the airport (e.g., to Approach Controller).
Disseminate RCR Locally	Dissemination of Runway Condition Report after Duty Officer validation locally at the airport (to APOC and TWR).
Disseminate SNOWTAM to AIS	RCAMS disseminates SNOWTAM to AIS.
Initiate RCR Dissemination	Airport Duty Officer initiates RCR dissemination using RCAMS DUTY OFFICER HMI.
Initiate SNOWTAM Dissemination	Airport Duty Officer initiates SNOWTAM dissemination using RCAMS DUTY OFFICER HMI.
Prepare RCR	After Airport Duty Officer confirms significant change of runway conditions, he is responsible also to prepare new RCR reflecting this change.
Provide SNOWTAM to AIS	Airport Duty Officer decides if the RCR needs to be converted to SNOWTAM. {In order to disseminate RCR to SNOWTAM, it shall be sent to AIS.}
RCR Input	Interface with RCR template enabling to compose RCR in compliance with ICAO GRF.
Validate RCR Dissemination	Airport Duty Officer has to validate RCR before dissemination (especially, if RCR has been prepared automatically based on computed runway conditions)

Table 14 : NSV-4 Runway Condition Dissemination

4.1.2.2.2 Resource Orchestration view - [NSV-4] Landing Preparation, Descent and Landing Roll

Flight operating on aircraft ROAAS equipped are provided with Runway Excursion risk alert from descent preparation, approach and landing roll.

This view describes the landing preparation and descent phases, linked to the following Uses Cases described in PJ_02-W2-25 INTEROP/OSED : PJ.02-W2-25-2-0: Runway Condition dissemination

Landing preparation is affected by runway contamination condition: do runway still complies with landing performance assessment at estimated time of landing, effected at time of dispatch?

ROAAS may alert Flight Crew when a risk of Runway Excursion occurs, following EUROCAE ED-250 specification in its basic implementation, possibly amended by a Certification Review item from Airworthiness Authorities.

According to PJ.02-W2-25-2-0 use case Runway Condition dissemination, the arriving aircraft can receive runway condion by :

- o   Configuration Capability Control Tower by ATIS or R/T
- o   Configuration Capability Airport Operations by SWIM RCR
- o   Configuration Capability Approach ATS by R/T

Runway condition can be updated at any time by the airport (following the validation of a new runway condtion to be disseminated by the Airport Duty Officer) and before landing ROAAS should then be updated with the new expected runway condition at the time of landing.

Figure 7 : [NSV-4] Landing Preparation, Descent and Landing Roll

New or modified functions have cyan background.

Function	Description
Assess Aircraft Stopping Capability from DH to Stopping Point	The system calculates the landing performance for the conditions selected during the setup, compares with actual landing distance available at destination, and triggers indications and alerts to flight crew if necessary to improve safety at landing.

Capture ROAAS Setup Parameters	
Display ROAAS Indicators	
Monitor Aircraft Stopping Capability	Monitor Aircraft stopping point in order to take appropriate actions to avoid runway excursion.
Prepare and Brief Expected Approach and Landing	The Flight Deck briefing concerns the following tasks: - obtain weather and landing information for destination and alternate airports - check current aircraft approach trajectory and landing runway - check up to date aircraft parameters at landing (weight, …)
Provide ROAAS Alert	
ROAAS Setup	ROAAS setup consists - to select the runway - to select the RWYCC value estimated at landing

Table 15 : NSV-4 Landing Preparation, Descent and Landing Roll

4.1.2.2.3 Resource Orchestration view - [NSV-4] Runway Clearance from any Winter Contaminant

This view describes the Resources Connectivity for Solution PJ.02-W2-25.1 and includes the realization of SPR-INTEROP/OSED Use Cases : PJ.02-W2-25-2-5: Decontamination execution

All runway operations are managed by the Airport Duty Officer who is responsible of the Airport Snow and Ice Clearance Plan implementation.

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The Winter Service team, in coordination with the airport duty officer is in charge of clearing runways and taxiways from any winter contaminant.

This view describes the decision and execution process of winter runway maintenance operation (chemical treatment or snow removal).

Figure 8 : [NSV-4] Runway Clearance from any Winter Contaminant

New or modified functions have cyan background.

Function	Description
Asses Runway Maintenance Needs	Airport Duty Officer shall assess if significant change of runway conditions requires also runway maintenance.

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Confirm Significant Change of RWY Conditions	Duty Officer is responsible for final confirmation of significant change of runway conditions identified by RCAMS Inference or PIREP.
Coordinate Runway Decontamination	Runway decontamination operation are performed by Winter Service Team under the Airport Duty Officer authority.
Display Relevant Data Related to RWY Conditions	RCAMS DUTY OFFICER HMI displays all relevant data related to RWY conditions. That includes valid RCR, outputs from RCAMS Inference (computed RWY conditions including RWYCC, contaminant coverage, type and depth and its short-term prediction) as well as some data from sensors (e.g. runway temperature, freezing point temperature, precipitation etc.).
Monitor Runway Condition	Duty Officer is responsible for runway condition assessment and reporting. Airport Duty Officer continuously monitors information on RCAMS DUTY OFFICER HMI, receives results from runway inspection, PIREPs and makes final assessment of runway conditions (e.g. confirmation or rejection of significant changed identified by RCAMS Inference or PIREP).
Perform Runway Decontamination	Runway decontamination is performed by the Winter Service Team under the Airport Duty Officer authority.
Plan Runway Closure	Airport traffic analysis; departure, arrival Tower controllers coordination, Approach controllers coordination; to define the runway closure slot which should fit to the airport operator needs (for runway inspection).
Request Runway Closure slot for Runway Maintenance	Before any Airport Operator activity on the runway, Airport Duty Officer or activity's responsible person will need to coordinate runway closure with TWR.

Table 16 : NSV-4 Runway Clearance from any Winter Contaminant

4.1.3 Resource Connectivity view [NSV-1] – **RCAMS non-nominal and transition connectivity**

This node view summarizes the RCAMS behaviour in non-nominal situations and system failures.

This view describes the Resources Connectivity for Solution PJ.25-W2-25.1 and includes the realization of SPR-INTEROP/OSED Use Cases:

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- PJ.02-W2-25-3: Failure of Runway Condition inference function without loss of Tower communication/ Persistent issue with input quality / Data source loss

- PJ.02-W2-25-4: General failure of RCAMS system to provide service

- PJ.02-W2-25-5: Transition from GRF to Solution working method

- PJ.02-W2-25-6 Failure of local RCR dissemination via RCAMS
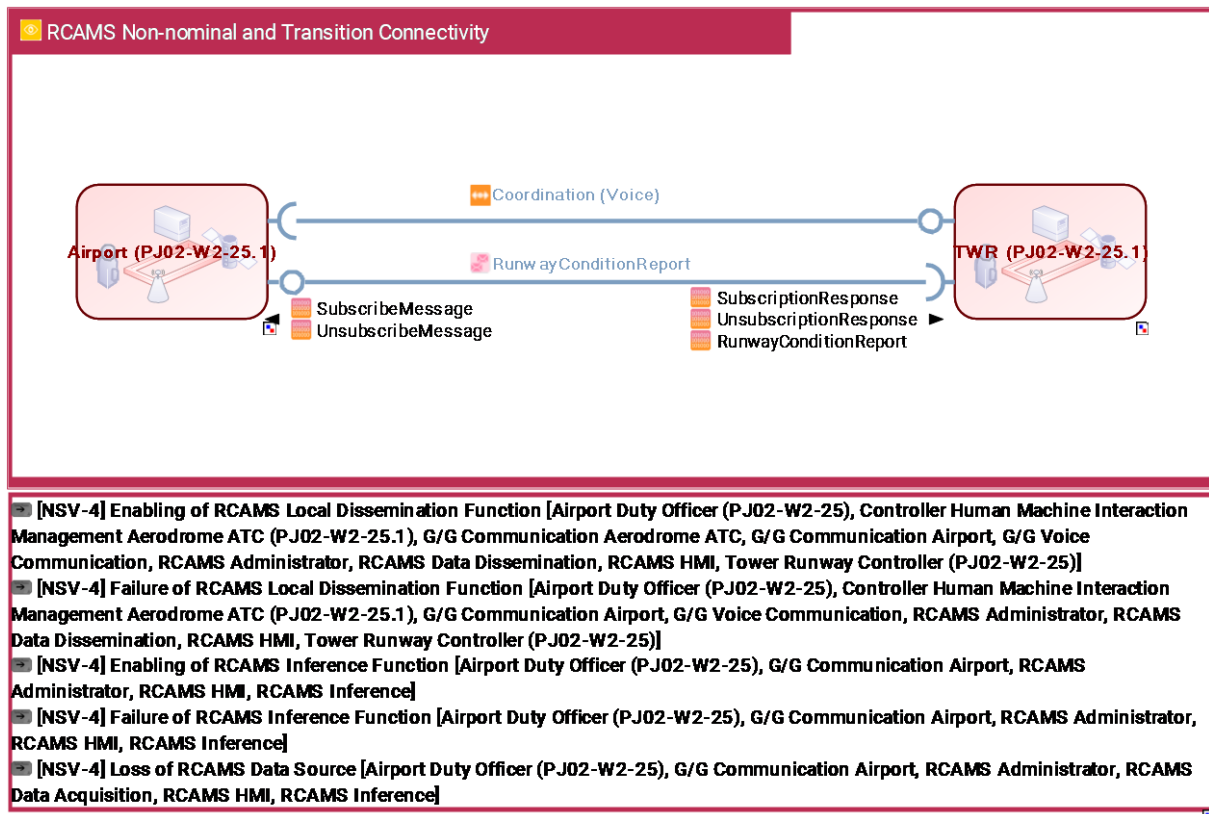
Figure 9 : [NSV-1] Resource Connectivity Model - **RCAMS non-nominal and transition connectivity**

4.1.3.1 Resource Infrastructure view [NSV-2] – **RCAMS non-nominal and transition connectivity**

This node view summarizes the information exchanges used when disseminating the runway status.

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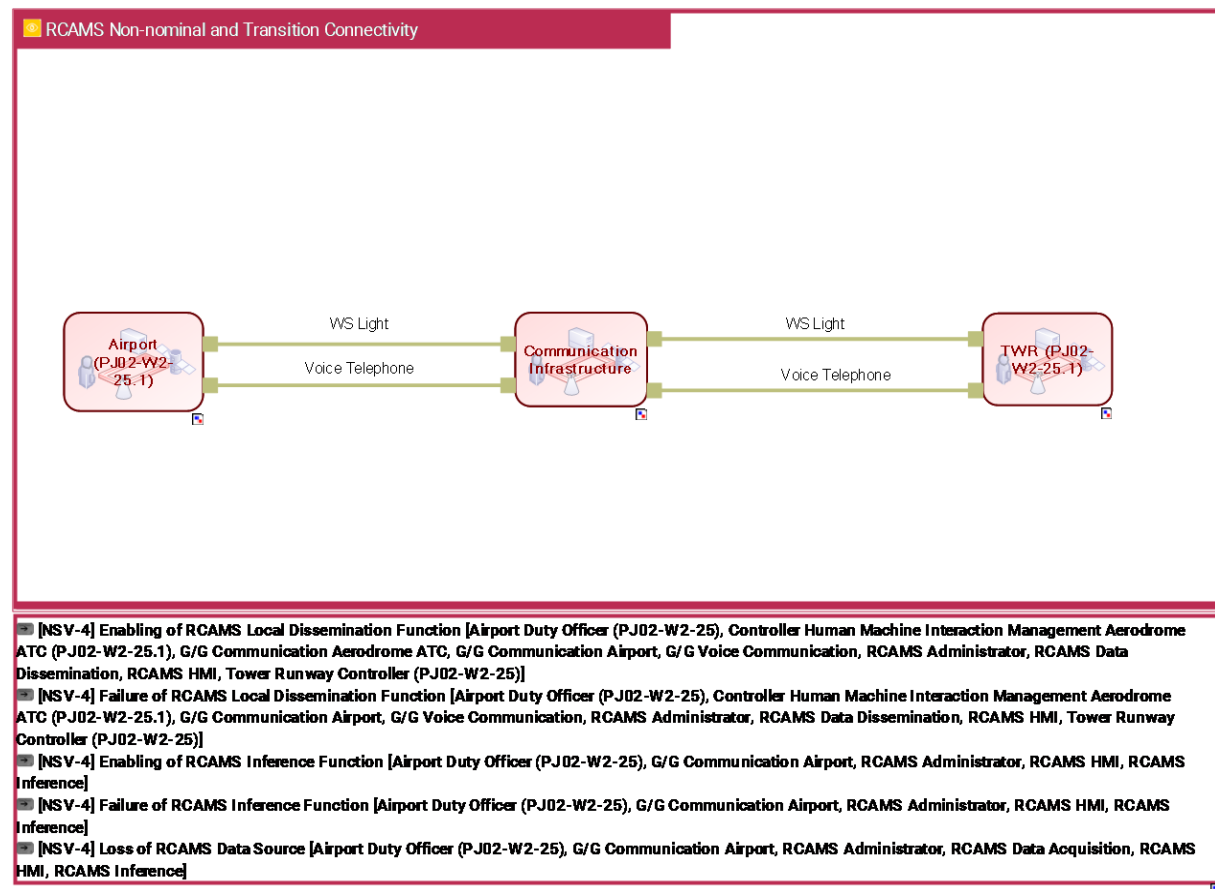
Figure 10 : [NSV-2] Infrastructure connectivity model - **RCAMS non-nominal and transition connectivity**

4.1.3.2 Resource Orchestration views [NSV-4]s – **RCAMS non-nominal and transition connectivity**

4.1.3.2.1 Resource Orchestration view - [NSV-4] Failure of RCAMS inference function

This NSV-4 diagram details the following diagram(s):

- [NOV-5] Failure of Runway Condition inference function without loss of Tower communication/ Persistent issue with input quality / Data source loss

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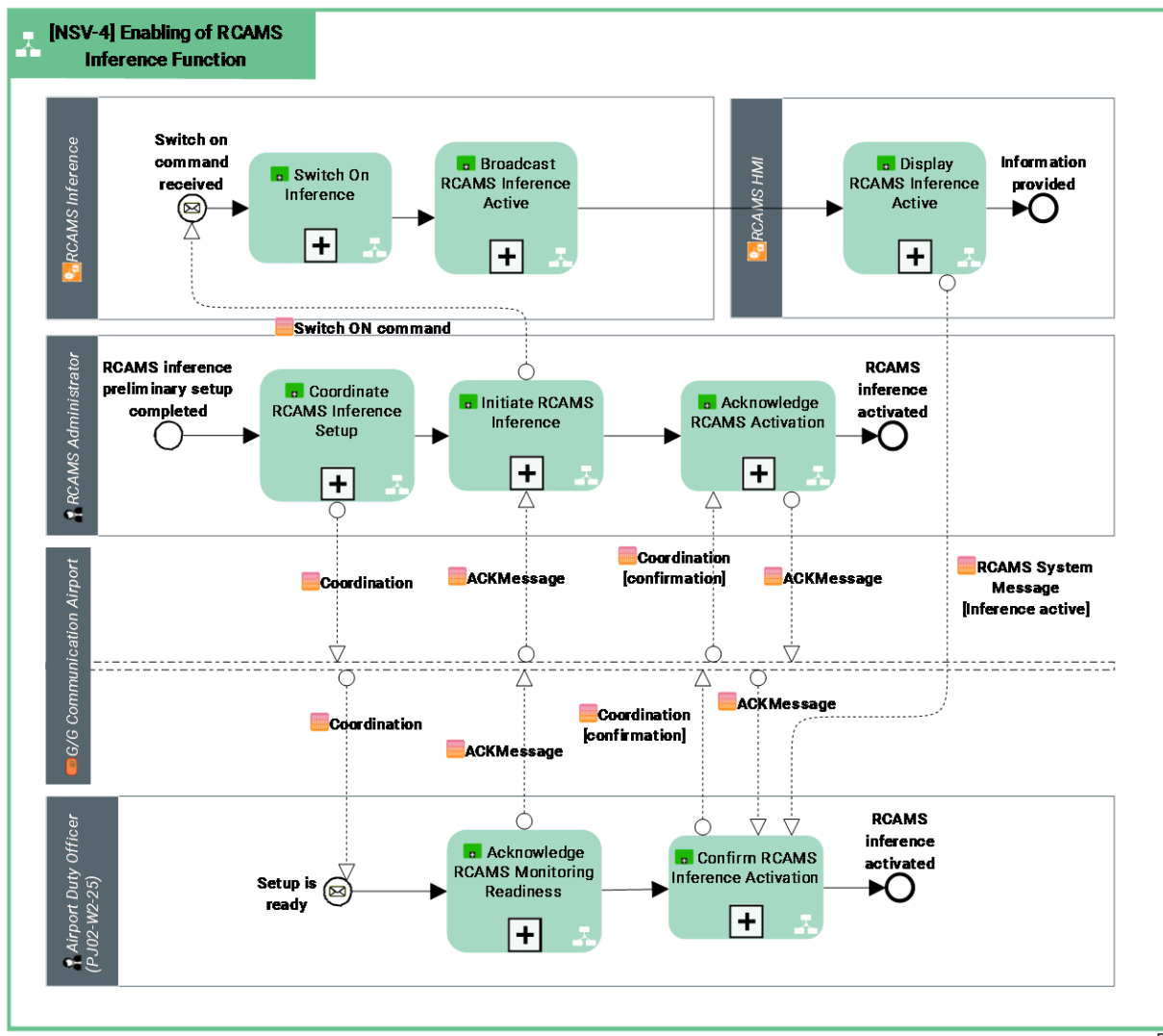
Figure 11 [NSV-4] for RCAMS inference failure

New or modified functions have cyan background.

Function	Description
Acknowledge RCAMS Activation	RCAMS Admin confirms that RCAMS inference has been successfully initiated.

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Acknowledge RCAMS Monitoring Readiness	Duty Officer confirms that they are ready to monitor RCAMS for runway condition advisory.
Broadcast RCAMS Inference Active	Upon start up RCAMS inference sends appropriate message to other RCAMS components.
Confirm RCAMS Inference Activation	Duty Officer confirms that RCAMS DUTY OFFICER HMI has properly activated.
Coordinate RCAMS Inference Setup	RCAMS Admin coordinates RCAMS inference start up with Duty Officer.
Display RCAMS Inference Active	RCAMS DUTY OFFICER HMI informs Duty Officer that RCAMS inference is now active.
Initiate RCAMS Inference	RCAMS Admin initiates RCAMS inference function.
Switch On Inference	The inference function is switched on.

Table 17 NSV-4 RCAMS inference failure

4.1.3.2.2 Resource Orchestration View – [NSV-4] Loss of RCAMS data source

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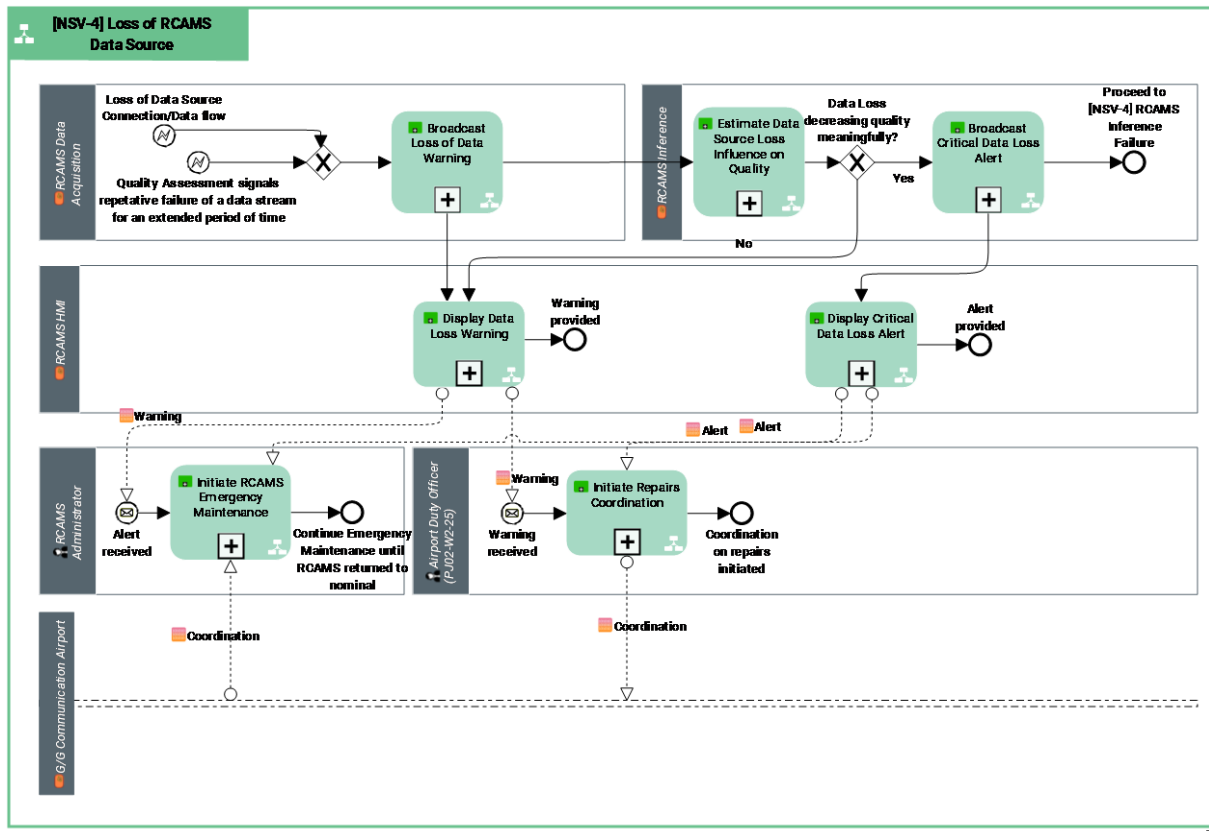
Figure 12 [NSV-4] Loss of RCAMS data source

New or modified functions have cyan background.

Function	Description
Broadcast Critical Data Loss Alert	Once RCAMS inference estimates the lost data to be critical for inference process, the critical data loss message is generated and broadcast to relevant RCAMS components.
Broadcast Loss of Data Warning	RCAMS Data Acquisition subroutine sends a data loss message to other relevant RCAMS components.
Display Critical Data Loss Alert	Once RCAMS Admin and Airport Duty Officer HMIs receive critical data loss message they display relevant alerts for operators.
Display Data Loss Warning	Data source loss warning is an information message alerting Airport Duty Officer that some data is missing but RCAMS inference is still able to perform its function without significant degradation.
Estimate Data Source Loss Influence on Quality	As data loss message arrives, the RCAMS inference is estimating the influence of the missing data in the inference process and categorizes the lost data into either critical or non-critical.

Initiate RCAMS Emergency Maintenance	RCAMS Admin initiates the emergency maintenance that addresses the identified failure leading to inference loss function.
Initiate Repairs Coordination	Airport Duty Officer coordinates with RCAMS Admin the necessary repairs.

Table 18 [NSV-4] Loss of RCAMS data source

4.1.3.2.3 Resource Orchestration View – [NSV-4] Failure of RCAMS local dissemination function
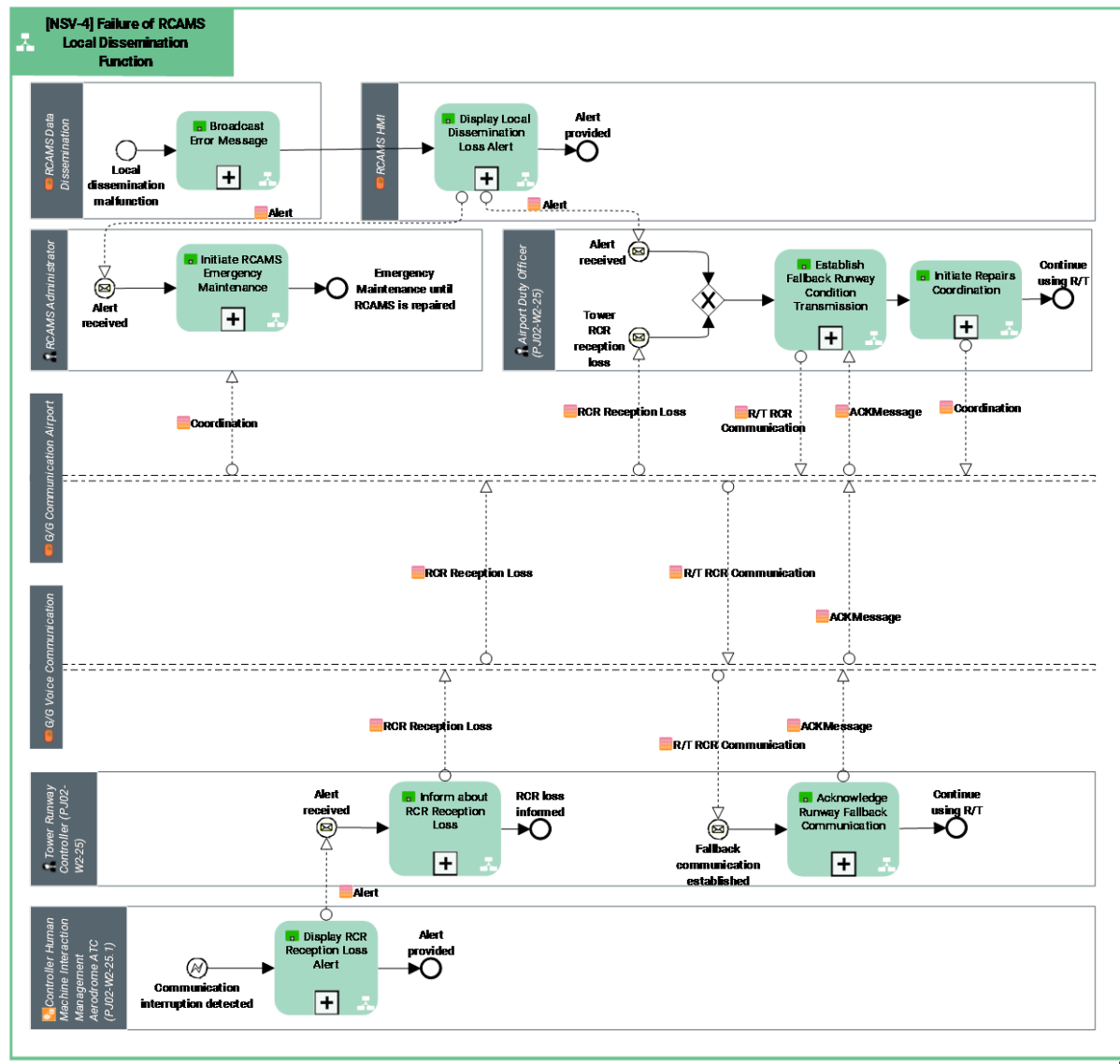
Figure 13 [NSV-4] Failure of RCAMS local dissemination function

New or modified functions have cyan background.

Function	Description

Acknowledge Runway Fallback Communication	ATCO confirms runway condition reception via R/T readiness to Airport Duty Officer.
Broadcast Error Message	Broadcast error message and metadata regarding local dissemination loss event.
Display Local Dissemination Loss Alert	An alert with relevant metadata shows up on Airport Duty Officer and RCAMS Admin HMIs regarding local dissemination loss.
Display RCR Reception Loss Alert	The Function is able to detect loss of connection with RCAMS server and inform Tower Runway Controller of loss of local runway condition dissemination function in form of a dedicated alert.
Establish Fallback Runway Condition Transmission	Airport Duty Officer establishes fallback R/T communication of the RWY condition to Tower.
Inform about RCR Reception Loss	Tower ATCO informs Airport Duty Officer of RCAMS dissemination loss.
Initiate RCAMS Emergency Maintenance	RCAMS Admin initiates the emergency maintenance that addresses the identified failure leading to inference loss function.
Initiate Repairs Coordination	Airport Duty Officer coordinates with RCAMS Admin the necessary repairs.

Table 19 [NSV-4] Failure of RCAMS local dissemination function

4.1.3.2.4 Resource Orchestration View – [NSV-4] Enabling of RCAMS local dissemination function
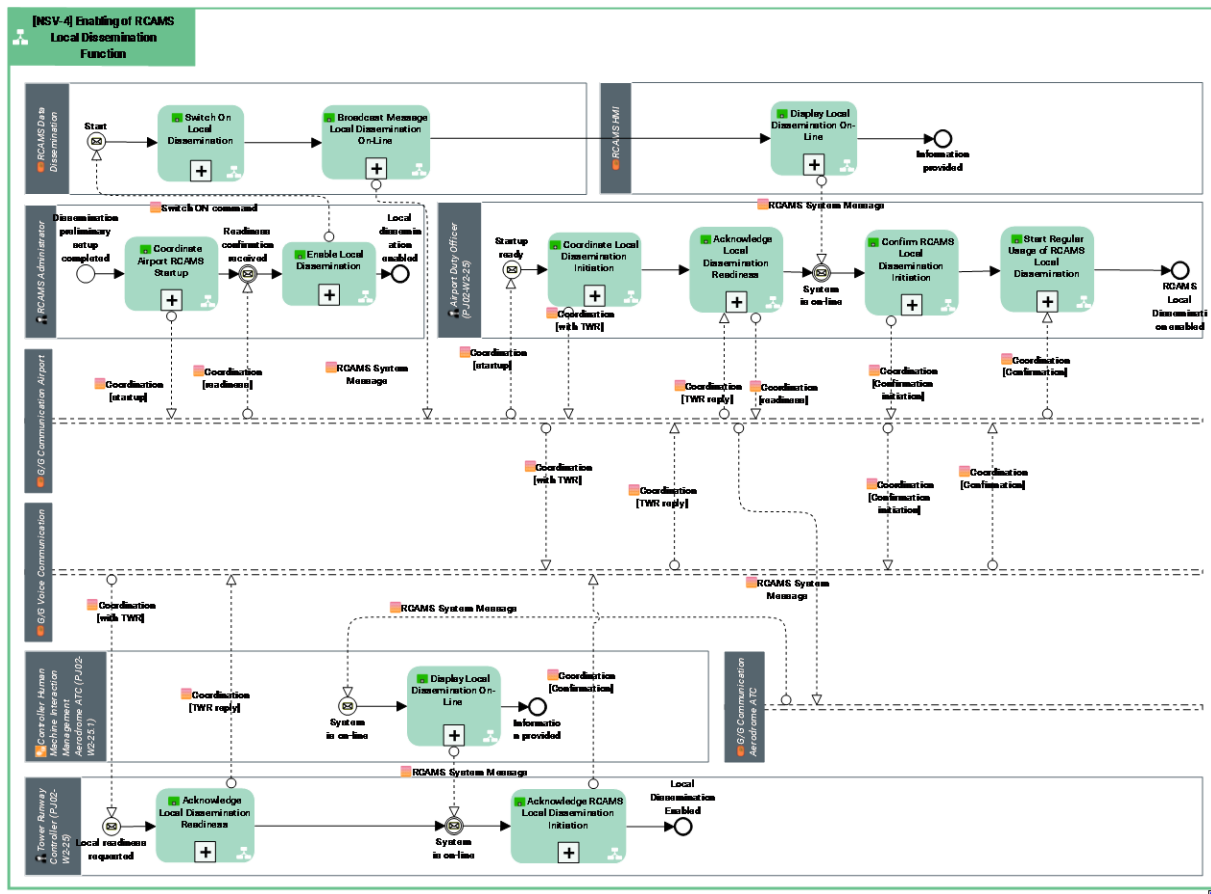
Figure 14 [NSV-4] Enabling of RCAMS local dissemination function

New or modified functions have cyan background.

Function	Description
Acknowledge Local Dissemination Readiness	Duty Officer confirms that both Airport Operations ad Tower are ready to initiate local runway condition dissemination via RCAMS.
Acknowledge RCAMS Local Dissemination Initiation	Tower Runway Controller confirms Tower readiness to switch runway condition dissemination mode to RCAMS.
Broadcast Message Local Dissemination On-Line	RCAMS local dissemination is on line and a message with appropriate metadata is sent to relevant RCAMS component.
Confirm RCAMS Local Dissemination Initiation	Duty Officer confirms that RCAMS is ready to disseminate runway condition.

Coordinate Airport RCAMS Startup	RCAMS Admin coordinates with all airport stakeholders but especially with Duty Officer the RCAMS start up.
Coordinate Local Dissemination Initiation	Duty Officer coordinates with Tower the RCAMS local dissemination function initiation.
Display Local Dissemination On-Line	Information that RCAMS is ready to support local dissemination is displayed on Airport Duty Officer and Tower Runway Controller HMIs.
Enable Local Dissemination	RCAMS Admin enables the RCAMS connection with Tower HMI.
Start Regular Usage of RCAMS Local Dissemination	Airport Duty Officer continues to regularly use RCAMS for local dissemination.
Switch On Local Dissemination	

Table 20 [NSV-4] Enabling of RCAMS local dissemination function

4.1.3.2.5 Resource Orchestration View – [NSV-4] Enabling of RCAMS inference function

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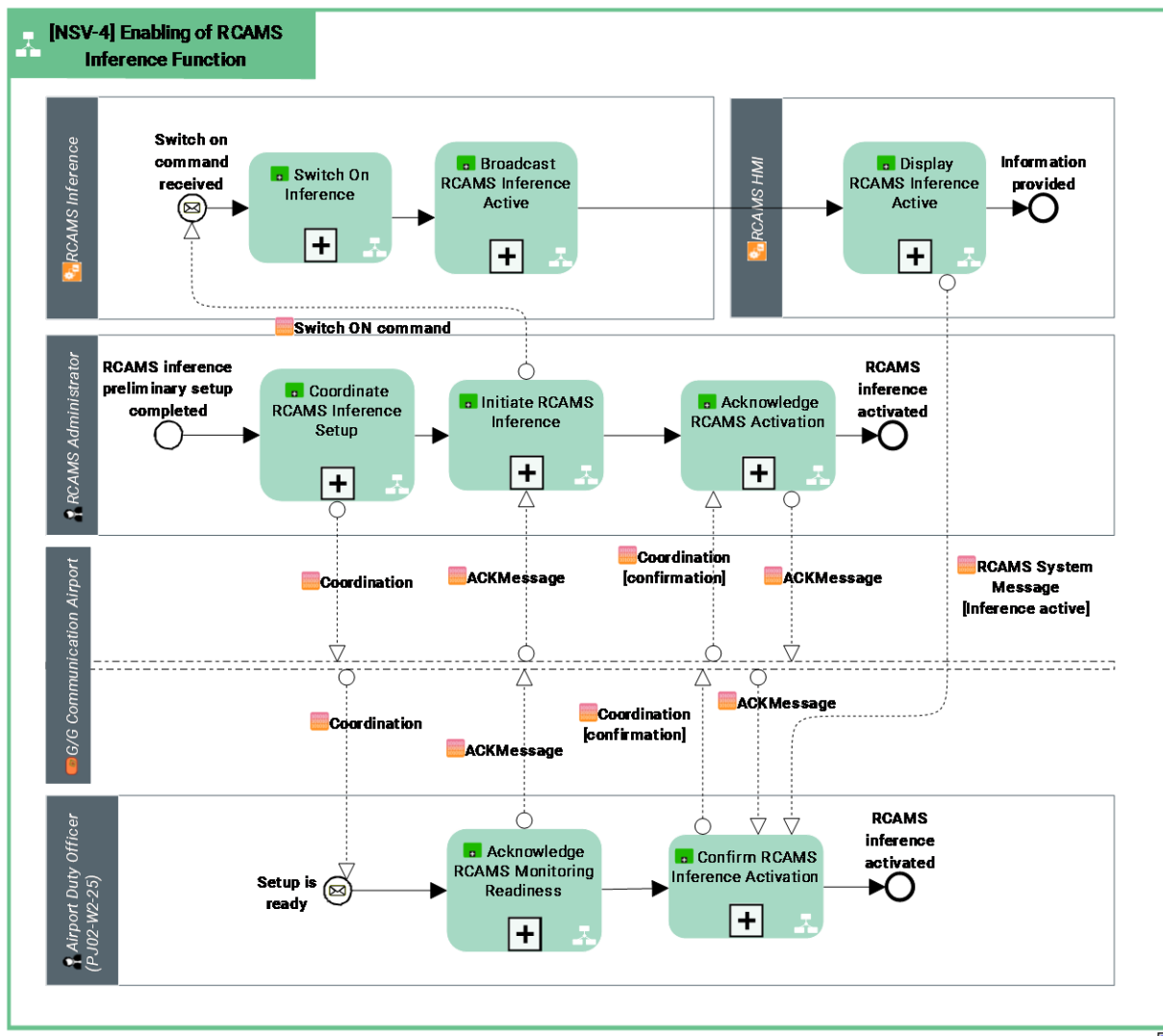
Figure 15 [NSV-4] Enabling of RCAMS inference function

New or modified functions have cyan background.

Function	Description
Acknowledge RCAMS Activation	RCAMS Admin confirms that RCAMS inference has been successfully initiated.
Acknowledge RCAMS Monitoring Readiness	Duty Officer confirms that they are ready to monitor RCAMS for runway condition advisory.
Broadcast RCAMS Inference Active	Upon start up RCAMS inference sends appropriate message to other RCAMS components.

Confirm RCAMS Inference Activation	Duty Officer confirms that RCAMS DUTY OFFICER HMI has properly activated.
Coordinate RCAMS Inference Setup	RCAMS Admin coordinates RCAMS inference start up with Duty Officer.
Display RCAMS Inference Active	RCAMS DUTY OFFICER HMI informs Duty Officer that RCAMS inference is now active.
Initiate RCAMS Inference	RCAMS Admin initiates RCAMS inference function.
Switch On Inference	

Table 21 [NSV-4] Enabling of RCAMS inference function

4.1.4 Resource Composition

Capability Configuration	Technical System	Role / Functional Block	Function
Aerodrome ATM-MET (PJ02-W2-25) Implemented by designated MET service providers. The Aerodrome ATM MET CC of an aerodrome provides services to address the ICAO obligation for MET service provision for aviation. In particular, this CC processes local sensor inputs.			
Airport (PJ02-W2-25) Implemented by the civil and military Airport Operator at the airport to manage the airside operations that interface with the ATM at the airport (e.g. runway closure coordination needed for runway inspection or runway maintenance).			
	Airport Operations Centre (PJ02-W2-25) Deals with the strategic and tactical management of airport operations in coordination with other ATM actors. In this respect, the system is the 'focal point' for the AOP		

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Capability Configuration	Technical System	Role / Functional Block	Function
	and NOP management at the airport. The main changes impacting the Airport Operations Centre Technical System within SESAR 1 are: · the integration of the AOP with the NOP; · the interface with UDPP to take the airspace users priorities into account in the Airport Activity In particular, the evolution of the AOP will address: · the finalisation of AOP-NOP information sharing that would ultimately lead the European standardisation; · the procedures to support AOP-NOP collaborative process, including AOP-NOP information quality requirements and · the exchange of AOP-NOP information through SWIM.		
	Runway Condition Awareness and Monitoring System		

Capability Configuration	Technical System	Role / Functional Block	Function
	Runway Condition Awareness and Monitoring System performs two functions: it assists in rapid dissemination of runway condition information (RCR) to local ATC stakeholders and it provides the Airport Duty Officer (and other relevant local airport stakeholders) with up to date estimation of runway condition and its nowcast. The core of the system is located at the airport, and as a result, is a part of the Airport Capability Configuration. Despite this, RCAMS also provides dedicated interfaces for Tower and APP controllers that facilitate runway condition dissemination. RCAMS is dependent on a set of data inputs in performing its function. The data RCAMS consumes are provided by other technical systems that may not be local to the airport.		
		RCAMS Data Acquisition Functions associated with acquiring and	Broadcast Loss of Data Warning ; Monitor RCAMS

Capability Configuration	Technical System	Role / Functional Block	Function
		preliminary evaluation of input data.	Inputs ; Preprocess RCAMS Input ;
		RCAMS Data Dissemination Dissemination of RCR and runway condition tendency to local airport stakeholders, local ANSP and stakeholders outside of airport.	Broadcast Error Message ; Broadcast Message Local Dissemination On-Line ; Disseminate RCR Externally ; Disseminate RCR Locally ; Disseminate SNOWTAM to AIS ; Switch On Local Dissemination ;
		RCAMS HMI Human-machine interface of RCAMS dedicated for Duty Officer or RCAMS Administrator (with privileged control access to the system).	Display Alert on Aircraft Braking Action Reception ; Display Alert on Significant Change of RWY Conditions ; Display Critical Data Loss Alert ; Display Data Loss Warning ; Display Inference Loss Alert ; Display Local Dissemination Loss Alert ; Display Local Dissemination On-Line ; Display No Alert ; Display RCAMS Inference Active ; Display RCR ; Display Relevant Data Related to RWY Conditions ; Initiate RCR Dissemination ; Initiate SNOWTAM Dissemination ; RCR Input ;
		RCAMS Inference RCAMS inference engine providing updates of current and predicted	Broadcast Critical Data Loss Alert ; Broadcast Error Message to Endpoints ; Broadcast

Capability Configuration	Technical System	Role / Functional Block	Function
		runway condition estimation.	RCAMS Inference Active ; Compare Computed RWY Conditions to Published RWY Conditions ; Compute RWY Conditions ; Estimate Data Source Loss Influence on Quality ; Switch On Inference ;
		Airport Duty Officer (PJ02-W2-25) The airport company has to operate the airport in accordance with international and national regulations and has to keep the airport in a safe condition. Airport operations are carried out by Airport Duty Officers. The Airport Duty Officer is the responsible manager for the daily operations, entitled by the airport operator to be in charge of assuring that the airport is operated in accordance with its national licensing conditions and international regulations. The main interactions are with the Aircraft Operators, ATC and Airport Operations. Responsibilities The Airport Duty Officer's main responsibilities are:	Coordinate Runway Decontamination ; Coordinate Runway Inspection ; Monitor Runway Condition ; Request Runway Closure Slot for Inspection ; Request Runway Closure slot for Runway Maintenance ; Receive Runway Inspection Results ; Prepare RCR ; Assess Runway Maintenance Needs ; Confirm Significant Change of RWY Conditions ; Validate RCR Dissemination ; Provide SNOWTAM to AIS ; Switch to Manual Runway Condition ; Initiate Repairs Coordination ; Monitor Runway Condition Manually ; Establish Fallback Runway Condition Transmission ; Coordinate Local Dissemination Initiation ;

Capability Configuration	Technical System	Role / Functional Block	Function
		- Supervision of local flight restrictions. - Changes to the Airport infrastructure, including the manoeuvring area under the delegated authority of the Tower Supervisor. - Initiating airport-related aeronautical publications and information. - Establishing airport policies and requirements. - Managing the implementing the Airport snow and ice clearance plan. - In case of accidents and emergencies acting as on-scene commander in coordination with the rescue services. - Ensuring the best interest of passengers and airlines are met.	Acknowledge Local Dissemination Readiness ; Confirm RCAMS Local Dissemination Initiation ; Start Usage of RCAMS Local Dissemination ; Acknowledge RCAMS Monitoring Readiness ; Confirm RCAMS Inference Activation
		Airport Runway Inspection Team The Runway Inspection team, under the direction of the airport duty officer is in charge of runways and taxiways inspection. Inspection may be visual and use manual measurements; or may use tools (friction	Perform Runway Inspection

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Capability Configuration	Technical System	Role / Functional Block	Function
		measurement devices, mobile sensors, etc.)	
		Airport Winter Service Team The Winter Service team, under the direction of the airport duty officer is in charge of clearing runways and taxiways from any winter contaminant.	Perform Runway Decontamination ;
		RCAMS Administrator	Acknowledge RCAMS Activation ; Coordinate Airport RCAMS Startup ; Coordinate RCAMS Inference Setup ; Enable Local Dissemination ; Initiate RCAMS Emergency Maintenance ; Initiate RCAMS Inference ;
Airport Data Service Provider			
	Airport DSP		
		Airport Data Processing	Parse OBACS Data ;
APP ACC (PJ02-W2-25) Implemented by the Civil and Military ATS ANSP in an Air Traffic Control Centre (Approach). It includes Sequence Management Technical System			

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Capability Configuration	Technical System	Role / Functional Block	Function
	En-Route / Approach ATC (PJ02-W2-25) Gathers the ground based automated means, used in En-Route and Approach ATC Centres, to support the air traffic controllers in the provision of the following main Air Traffic Services: · Update and distribution of flight plan data, potentially correlated with track data built from surveillance sources (mode 3/A code or 24 bit ICAO address - Aircraft Identification (Mode S or ADS-B), when available) · Distribution of warnings and alerts upon detection of danger areas / separation criteria infringement, or on non-conformance between aircraft behaviour and corresponding flight plan data, · Medium-term and tactical conflicts detection, conflicts resolution assistance and local traffic complexity assessment		

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Capability Configuration	Technical System	Role / Functional Block	Function
	· Sequencing of arrival aircraft on aerodromes or groups of aerodromes, · Ground-ground and air-ground exchanges of flight and environment data.		
Civil and Military Aircraft (PJ02-W2-25) Reflects the generic implementation of the Aircraft Technical System by a Civil Airspace User to perform its operations in the Air or on the APRON / Runway / Taxiway. In the context of the Solution (Runway Excursion avoidance), any kind of aircraft is concerned: civil, military, RPAS. Runway condition is to consider for take-off and landing performance assessment to set-up TOMS and ROAAS. Braking Action reported by PIREP / Computed Braking Action (if OBACS equipped) automatically computed and transmitted to Airport are used by			

Capability Configuration	Technical System	Role / Functional Block	Function
Airport to consolidated runway condition assessment.			
	Aircraft (PJ02-W2-25) Represents the Aircraft (Civil or Military or UAV) operating from the end to end, on the airport surface and in the air. The main groupings of functionalities are the ones dealing with ATM: · Communication (voice, air ground data link, information domain); · Navigation (Flight path management gate to gate, flight control, position determination); · Surveillance (traffic, weather, terrain); · Other A/C functions (displays and controls, alerts, recording, databases, sensors and antennas, information domain display).		
		Alerts (PJ02-W2-25) The function providing Visual and/or Audio Alerts to the Flight Crew.	Alerts Management ; Provide ROAAS Alert ;

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Capability Configuration	Technical System	Role / Functional Block	Function
		Displays and Controls (PJ02-W2-25) The function centralising HMI related functions for avionics including graphic user interface.	Capture ROAAS Setup Parameters ; Display Computed Braking Action ; Display ROAAS Indicators
		On-Board Braking Action Computation On-board braking action computing system which uses the aircraft as a runway condition assessment mean.	Aircraft Computed Braking Action Dissemination ; Compute Braking Action ;
		Runway Overrun Awareness and Alerting (PJ02-W2-25) Aircraft functionality to monitor aircraft runway excursion risk during landing approach and roll, and provide indications and alerts to flight crew. Used only (not developed by this solution).	Assess Aircraft Stopping Capability from DH to Stopping Point ;
		Flight Crew (PJ02-W2-25) For Flight Crews, new roles and responsibilities in an airline with a FOC will exist: - During the planning phase: the Flight Crew receives the planning restrictions from the FOC and specific instructions for the flight ("fly as filed" or try to adhere to planning TTs, in function of business model for the specific flight). The	A/G Voice Communication ; Braking Action Pilot Assessment ; Communicate Braking Action ; Prepare and Brief Expected Approach and Landing ; ROAAS Setup ; Monitor Aircraft Stopping Capability

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Capability Configuration	Technical System	Role / Functional Block	Function

		Flight Crew also receives his planned Take Off time, if leaving from an airport inside the horizon from destination AMAN – or as in planning.
		
		- The Flight Crew is informed when the SBT/SMT becomes RBT/RMT (airline's decision to go to "Reference" trajectories)
		
		- The Flight Crew is involved in different CDM processes (just with controlling ATCO or with several actors) :
		    o Acting on Take Off time to meet Arrival Time restrictions
		    o Revision process
		
		- The Flight Crew may perform new types of manoeuvres/procedures:
		    o ASPA FIM with CDTI assistance (ASAS)
		    o fly the speed as filed or try to adhere to TTs restrictions from the planning phase (depending on airline's decision)
		    o Execute CTA for Arrival Management Process following CTA uplink
		
		- The Flight Crew will integrate in his decision process new information resulting from increased situational awareness on the ground (standard operations and low	

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Capability Configuration	Technical System	Role / Functional Block	Function
		visibility operations) : o Airport surface lay-out and traffic/vehicles on surface during taxi-in/-out o Runway incursion/excursion prevention o Airport Safety Nets integration o Runway Occupancy time management - The Flight Crew will integrate in his decision process new information resulting from increased situational awareness during the flight (latest available data for Flight Crew) : o Better knowledge of surrounding traffic o Integration of 4DWx Cube data o Airspace information (e.g. ARES) and other data for flight optimization and arrival preparation If A/C is equipped, the Flight Crew will update ROAAS with the most up to date runway condition data.	
Civil and State AU Operations Centre (PJ02-W2-25) Implemented by Civil Airspace Users realizing manned or unmanned flight operations of civil			

Capability Configuration	Technical System	Role / Functional Block	Function
aircraft (as defined by ICAO). In the context of the Solution (Runway Excursion avoidance), any kind of operation is concerned: civil, military, RPAS, which now integrate runway condition provided by airport.			
	Civil AU Flight Operations Centre (FOC) (PJ02-W2-25) Supports Airspace Users performing manned or unmanned flight operations of civil aircraft (as defined by ICAO). The FOC Technical System represents the 'Flight Operations' domain as part of the whole operations of the Airspace User. The domain 'Flight Operations' covers all activities that deal with the flights operated by the Airspace Users. These activities refer to the medium- and short-term planning and the execution phases of the flights.		

Capability Configuration	Technical System	Role / Functional Block	Function
Regional AIM (PJ02-W2-25) Related to the provision of Aeronautical Information Services at regional (European) level. The European AIM database (EAD) is an example of a Regional AIM Capability Configuration providing complete AIS services; Commercial AIS service providers (e.g. Jeppesen or others) are other examples of such CCs providing AIS services.			
	AIM (PJ02-W2-25) Implements functionalities to collect, process, validate and verify, store, integrate, exchange and deliver quality-assured aeronautical data and aeronautical information (static and dynamic) as stipulated in the State obligations in ICAO Annex 15 (e.g. AIP, NOTAM).		
Surveillance			

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Capability Configuration	Technical System	Role / Functional Block	Function
Infrastructure Airport (PJ02-W2-25) Implemented by Surveillance Service providers for Airport and consists of sensors and any other provisions to ensure that A/C position, identity and other aircraft parameters are available to the ground systems.			
TWR (PJ02-W2-25) Implemented by the civil and military ATS ANSP in an Air Traffic Control Tower at an aerodrome.			
	Aerodrome ATC (PJ02-W2-25) Supports the ATC controllers at an aerodrome and provides the following main functionalities: - surface routing and guidance, - infrastructure (weather, lighting, datalink) management, - safety nets, - aerodrome surveillance,		

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Capability Configuration	Technical System	Role / Functional Block	Function
	- flight data processing, - departure management.		
		Controller Human Machine Interaction Management Aerodrome ATC (PJ02-W2-25) This functional block provides controllers with a graphical user interface and with the means to interact with the Aerodrome ATC system. The CHMIM Functional Block collects and integrates different Human Machine Interfaces developed for the different airport systems into just one homogenous set of configurable and customisable Tower Human Machine Interfaces.	Alert on New RCR ; Display Local Dissemination On-Line ; Display RCR ; Display RCR Reception Loss Alert
		Airport Tower Supervisor (PJ02-W2-25) The Tower Supervisor is responsible for the safe and efficient provision of air traffic services by the Tower crew. He decides on staffing and manning of Controller Working Positions in accordance with expected traffic demand. He represents the Tower when coordinating with the	ATIS Update and Publication ; PIREP Braking Action Dissemination ; PIREP-Braking Action reception ; Plan Runway Closure ;

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Capability Configuration	Technical System	Role / Functional Block	Function
		Airport Operator on operational issues. Main Responsibilities The Tower Supervisor's main responsibilities are: - Provide and maintain resource management of the Tower - Decide on runway(s) for landing and take-off in cooperation with all concerned partners - Maintain close liaison with the Airport Operator with respect to the daily inspection of the movement area, the aerodrome lighting system, the marking of obstructions, snow clearance etc. - Coordinate with the Airport Operator regarding traffic emergencies/incidents on the movement area - Coordinate with the ACC/Approach/TMA Supervisors and Local Traffic Manager regarding the implementation of traffic smoothing measures (i.e. spacing between same direction departures) - Implement and discontinue limited visibility operations (CAT II or CAT III) after liaison with Airport Operator	

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Capability Configuration	Technical System	Role / Functional Block	Function
		and ACC/Approach/TMA Supervisors	
		Tower Runway Controller (PJ02-W2-25) The Tower Runway Controller is responsible for the provision of Air Traffic Services to aircraft within the control zone, or otherwise operating in the vicinity of controlled aerodromes (unless transferred to Approach Control/ACC, or to the Tower Ground Controller), by issuing clearances, instructions and permission to aircraft, vehicles and persons as required for the safe and efficient flow of traffic. The Tower Runway Controller will be assisted by arrival, departure and surface management systems, where available. Main Responsibilities: The Tower Runway Controller's main responsibilities are: - Issue clearance to enter/ leave/ cross the control zone. - Issue clearance to enter the traffic circuit. - Issue clearance for VMC Approach to IFR flights	Acknowledge Local Dissemination Readiness ; Acknowledge RCAMS Local Dissemination Initiation ; Acknowledge Runway Fallback Communication ; Communicate Runway Conditions ; Inform about RCR Reception Loss ;

Capability Configuration	Technical System	Role / Functional Block	Function
		- Sequence departures. - Ensure sufficient spacing between successive departures. - Issue landing clearance to arriving flights and the runway exit point, as appropriate. - Issue instructions to arriving flights to go-around when it is unsafe to land (e.g. runway still occupied). - Provide information on runway breaking action. - Provide information wind direction and speed on final approach. - Give instructions to taxi to the take-off position for departing flights and operate the stop bars if required. - Issue take-off clearance to departing flights. - Operate the aerodrome lighting system in cooperation with the Tower Ground Controller. - Trigger additional runway inspections in case of suspected Foreign Object Debris (FOD) or unexpected pollution of the runway surface.	

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Capability Configuration	Technical System	Role / Functional Block	Function
		- Issue essential local traffic information and essential aerodrome information. - Provide reports/observations of significant weather changes from that published. - Trigger alert and intervention of emergency vehicles in case of incident or accident - Manage integration of departures in the arrival sequence in mixed-mode operations.	

Table 22 Resource Composition

4.1.5 Service view

4.1.5.1 Service description

Service	Service description
RunwayConditionReport	Dissemination of runway condition assessment to be used by various stakeholders. Runway condition RCR (Runway Condition Report of ICAO defined SNOWTAM) plus complementary prediction on runway condition.
RunwayConditionReport	Dissemination of runway condition assessment to be used by various stakeholders. Runway condition RCR (Runway Condition Report of ICAO defined SNOWTAM) plus complementary prediction on runway condition.
AirportMETForecast	A service providing MET parameters forecasted at the airport.
AirportMETNowcast	Service to provide a now cast for an airport.
AirportMETObservation	A service providing MET parameters observed at the airport.
METAR	A service providing the METAR bulletin according to ICAO Annex 3 requirements
RunwayBrakingAction	Braking action provided by OBACS equipped aircraft; or input by Tower controller from a PIREP.

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Table 23 Service Description

4.1.5.2 Service Provisioning

Interaction	Consumer CC	Consumer System	Provider CC	Provider System
Operational Communication (Data).Civil and Military Aircraft (PJ02-W2-25)_CC and Civil and State AU Operations Centre (PJ02-W2-25)_CC	Civil and Military Aircraft (PJ02-W2-25)	Aircraft;	Civil and State AU Operations Centre (PJ02-W2-25)	Civil AU Flight Operations Centre (FOC);
Coordination (Voice).TWR (PJ02-W2-25) and Airport (PJ02-W2-25)	Airport (PJ02-W2-25)	Airport Operations Centre;	TWR (PJ02-W2-25)	Voice;
Controller Pilot ATC exchange(Voice).Civil and Military Aircraft (PJ02-W2-25)_CC and APP ACC (PJ02-W2-25)_CC	Civil and Military Aircraft (PJ02-W2-25)	Aircraft;	APP ACC (PJ02-W2-25)	Voice;
RunwayBrakingAction.Airport Data Service Provider_CC and Airport (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System;	Airport Data Service Provider	Airport DSP;
AirportMETNowcast.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System; Airport Airside Operations; Airport Operations Centre;	Aerodrome ATM-MET (PJ02-W2-25)	4DWxCube;
AirportMETForecast.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System; Airport Airside Operations; Airport Operations Centre;	Aerodrome ATM-MET (PJ02-W2-25)	4DWxCube;

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Interaction	Consumer CC	Consumer System	Provider CC	Provider System
METAR.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System; Airport Airside Operations; Airport Operations Centre;	Aerodrome ATM-MET (PJ02-W2-25)	4DWxCube;
AirportMETObservation.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System; Airport Airside Operations; Airport Operations Centre;	Aerodrome ATM-MET (PJ02-W2-25)	4DWxCube;
Local MET Observations.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System;	Aerodrome ATM-MET (PJ02-W2-25)	4DWxCube; Standard MET Sensors; Enhanced MET Sensors;
RunwayBrakingAction.Airport (PJ02-W2-25)_CC and Civil and Military Aircraft (PJ02-W2-25)	Airport Data Service Provider	Airport DSP;	Civil and Military Aircraft (PJ02-W2-25)	Aircraft;
Controller Pilot ATC exchange(Voice).Civil and Military Aircraft (PJ02-W2-25)_CC and TWR (PJ02-W2-25)	TWR (PJ02-W2-25)	Voice;	Civil and Military Aircraft (PJ02-W2-25)	Aircraft;
Aircraft and Vehicle position reports and target information.Airport (PJ02-W2-25)_CC and Surveillance Infrastructure Airport (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System; Airport Airside Operations;	Surveillance Infrastructure Airport (PJ02-W2-25)	Surface Movement Radar; ADS-B Ground Station; Airport Multilateration; Multistatic Primary Radar; Video Surveillance;
Coordination (Voice).Airport (PJ02-W2-25)_CC and TWR (PJ02-W2-25)_CC	Airport (PJ02-W2-25)	Airport Operations Centre;	TWR (PJ02-W2-25)	Voice;

Interaction	Consumer CC	Consumer System	Provider CC	Provider System
Controller Pilot ATC exchange(Voice).Civil and Military Aircraft (PJ02-W2-25)_CC and TWR (PJ02-W2-25)_CC	Civil and Military Aircraft (PJ02-W2-25)	Aircraft;	TWR (PJ02-W2-25)	Voice;
SNOWTAM Message.Civil and State AU Operations Centre (PJ02-W2-25)_CC and Regional AIM (PJ02-W2-25)_CC	Civil and State AU Operations Centre (PJ02-W2-25)	Civil AU Flight Operations Centre (FOC);	Regional AIM (PJ02-W2-25)	AIM;
SNOWTAM Message.Regional AIM (PJ02-W2-25)_CC and Airport (PJ02-W2-25)_CC	Regional AIM (PJ02-W2-25)	AIM;	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System; Airport Airside Operations;
RunwayConditionReport.TWR (PJ02-W2-25)_CC and Airport (PJ02-W2-25)_CC	TWR (PJ02-W2-25)	Aerodrome ATC;	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System;
RunwayConditionReport.APP ACC (PJ02-W2-25)_CC and Airport (PJ02-W2-25)_CC	APP ACC (PJ02-W2-25)	En-Route / Approach ATC;	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System;
RunwayConditionReport.Airport (PJ02-W2-25)_CC and TWR (PJ02-W2-25)_CC	TWR (PJ02-W2-25)	Aerodrome ATC;	Airport (PJ02-W2-25)	Runway Condition Awareness and Monitoring System;
Coordination (Voice).TWR (PJ02-W2-25)_CC and Airport (PJ02-W2-25)	Airport (PJ02-W2-25)	Airport Operations Centre;	TWR (PJ02-W2-25)	Voice;

Table 24 Service Provisioning

4.1.5.3 Service Realization

4.1.5.3.1   Interaction Coordination (Voice).TWR (PJ02-W2-25)_CC and Airport (PJ02-W2-25)

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_TELEPHONE at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_TELEPHONE at TWR_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

4.1.5.3.2   Interaction RunwayConditionReport.Airport (PJ02-W2-25)_CC and TWR (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS Light at Airport (PJ02-W2-25)_CC

Protocol Stack	Protocol
WS Light	
	HTTP 1.1

	TLS 1.2

System Port: WS Light at TWR_CC

Protocol Stack	Protocol
WS Light	
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

4.1.5.3.3 Interaction Controller Pilot ATC exchange(Voice).Civil and Military Aircraft (PJ02-W2-25)_CC and APP ACC (PJ02-W2-25)_CC

System Port: ATC_VOICE_MFC_GND at APP ACC_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP

Protocol Stack	Protocol
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP
OPC (Operational) Voice ground	

System Port: ATC_VOICE_QSIG_GND at APP ACC_CC

Protocol Stack	Protocol
ATC Voice (QSIG) ground	
	ATS QSIG

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP
OPC (Operational) Voice ground	

System Port: ATC_VOICE at Civil Aircraft (PJ.03b-06)_CC

Protocol Stack	Protocol

Protocol Stack	Protocol
ATC Voice air	
	VHF - AM 25kHz/8.33kHz
	HF - AM 25kHz

System Port: VOICE_RADIO_AIR at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice air	
	VHF - AM 25kHz/8.33kHz
	HF - AM 25kHz
OPC (Operational) Voice air	
	VHF
	HF (selcal)

System Port: ATC_VOIP_GND at APP ACC_CC

Protocol Stack	Protocol
EUROCAE ED-137B	

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP

OPC (Operational) Voice ground	

System Port: ATC_VOICE_RADIO_GND at APP ACC_CC

Protocol Stack	Protocol
Voice Radio	
	4/6/8-wire E_M

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP
OPC (Operational) Voice ground	

4.1.5.3.4 Interaction Controller Pilot ATC exchange(Voice).Civil and Military Aircraft (PJ02-W2-25)_CC and TWR (PJ02-W2-25)_CC

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2

ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP
OPC (Operational) Voice ground	

System Port: ATC_VOICE_MFC_GND at TWR_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP

	IP
OPC (Operational) Voice ground	

System Port: ATC_VOICE_QSIG_GND at TWR_CC

Protocol Stack	Protocol
ATC Voice (QSIG) ground	
	ATS QSIG

System Port: ATC_VOICE at Civil Aircraft (PJ.03b-06)_CC

Protocol Stack	Protocol
ATC Voice air	
	VHF - AM 25kHz/8.33kHz
	HF - AM 25kHz

System Port: VOICE_RADIO_AIR at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice air	
	VHF - AM 25kHz/8.33kHz
	HF - AM 25kHz
OPC (Operational) Voice air	
	VHF
	HF (selcal)

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP

	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP
OPC (Operational) Voice ground	

System Port: ATC_VOIP_GND at TWR_CC

Protocol Stack	Protocol
EUROCAE ED-137B	

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP
OPC (Operational) Voice ground	

System Port: ATC_VOICE_RADIO_GND at TWR_CC

Protocol Stack	Protocol

Voice Radio	
	4/6/8-wire E_M

4.1.5.3.5 Interaction Coordination (Voice).TWR (PJ02-W2-25) and Airport (PJ02-W2-25)

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_TELEPHONE at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_TELEPHONE at TWR_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

4.1.5.3.6 Interaction Operational Communication (Data).Civil and Military Aircraft (PJ02-W2-25)_CC and Civil and State AU Operations Centre (PJ02-W2-25)_CC

System Port: ACARS_RADIO_AIR at Communication Infrastructure_CC

Protocol Stack	Protocol
ACARS air (radio)	
	ARINC 618
	ARINC 622

| | AVLC |

System Port: AOC_ACARS at Civil Aircraft (PJ.03b-06)_CC

Protocol Stack	Protocol
ACARS air (radio)	
	ARINC 618
	ARINC 622
	AVLC
ACARS air (satcom)	
	AMSS618
	ARINC 622
	AMSS Data 2

System Port: AOC_ACARS_GND at Civil AU Operations Centre (PJ.03b-06)_CC

Protocol Stack	Protocol
ACARS ground	
	ARINC 618
	ARINC 620
	BATAP
	MATIP
	TCP
	IP

System Port: ACARS_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
ACARS ground	
	ARINC 618
	ARINC 620
	BATAP
	MATIP
	TCP
	IP

4.1.5.3.7 Interaction RunwayConditionReport.APP ACC (PJ02-W2-25)_CC and Airport (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS Light at Airport (PJ02-W2-25)_CC

Protocol Stack	Protocol
WS Light	
	HTTP 1.1
	TLS 1.2

System Port: WS Light at APP ACC_CC

Protocol Stack	Protocol
WS Light	
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

4.1.5.3.8 Interaction RunwayConditionReport.TWR (PJ02-W2-25)_CC and Airport (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS Light at Airport (PJ02-W2-25)_CC

Protocol Stack	Protocol

WS Light	
	HTTP 1.1
	TLS 1.2

System Port: WS Light at TWR_CC

Protocol Stack	Protocol
WS Light	
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

4.1.5.3.9 Interaction SNOWTAM Message.Civil and State AU Operations Centre (PJ02-W2-25)_CC and Regional AIM (PJ02-W2-25)_CC

System Port: AIM_GND at Civil AU Operations Centre (PJ.03b-06)_CC

Protocol Stack	Protocol
AFTN Asynchrounous	
	AFTN

System Port: MHS_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
AFTN Asynchrounous	
	AFTN
AMHS IPS	
	X.400
	TCP
	IP

System Port: AIM_GND at Regional AIM_CC

Protocol Stack	Protocol

Protocol Stack	Protocol
AFTN Asynchrounous	
	AFTN

System Port: MHS_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
AFTN Asynchrounous	
	AFTN
AMHS IPS	
	X.400
	TCP
	IP

4.1.5.3.10 Interaction SNOWTAM Message.Regional AIM (PJ02-W2-25)_CC and Airport (PJ02-W2-25)_CC

System Port: MHS_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
AFTN Asynchrounous	
	AFTN
AMHS IPS	
	X.400
	TCP
	IP

System Port: AIM_GND at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
AFTN Asynchrounous	
	AFTN

System Port: AIM_GND at Regional AIM_CC

Protocol Stack	Protocol
AFTN Asynchrounous	

	AFTN

System Port: MHS_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
AFTN Asynchrounous	
	AFTN
AMHS IPS	
	X.400
	TCP
	IP

4.1.5.3.11 Interaction Aircraft and Vehicle position reports and target information.Airport (PJ02-W2-25)_CC and Surveillance Infrastructure Airport (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: SUR_MLAT_GND at Surveillance Infrastructure Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
MLAT ground	
	Asterix Cat20
	UDP
	IP

4.1.5.3.12 Interaction AirportMETForecast.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Aerodrome ATM-MET (PJ.03b-06)_CC

Protocol Stack	Protocol

Protocol Stack	Protocol
WS SOAP	
	SOAP 1.1 or 1.2
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
WS SOAP	
	SOAP 1.1 or 1.2
	HTTP 1.1
	TLS 1.2

Service Interface Definition	
AirportMETForecastPublisher	
Standard	**MEP, Security Configuration, Interface Bindings**
AirportMETForecastProvider.YP.WS SOAP	MEPs Supported: 　　SRR 　　PSPUSH 　　PSPULL Security Configuration: Interface Binding Traceability: 　　REQ-14.01.04-TS-0901.0790 　　REQ-14.01.04-TS-0901.0795 　　REQ-14.01.04-TS-0901.0304 　　REQ-14.01.04-TS-0901.0305 　　REQ-14.01.04-TS-0901.0325

Service Interface Definition	
AirportMETForecastSubscriber	
Standard	**MEP, Security Configuration, Interface Bindings**
AirportMETForecastProvider.YP.WS SOAP	MEPs Supported:

	SRR
	PSPUSH
	PSPULL
	
	Security Configuration:
	
	Interface Binding Traceability:
	    REQ-14.01.04-TS-0901.0790
	    REQ-14.01.04-TS-0901.0795
	    REQ-14.01.04-TS-0901.0304
	    REQ-14.01.04-TS-0901.0305
	    REQ-14.01.04-TS-0901.0325

4.1.5.3.13 Interaction AirportMETNowcast.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Aerodrome ATM-MET (PJ.03b-06)_CC

Protocol Stack	Protocol
WS SOAP	
	SOAP 1.1 or 1.2
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
WS SOAP	

| SOAP 1.1 or 1.2 |
| HTTP 1.1 |
| TLS 1.2 |

4.1.5.3.14 Interaction AirportMETObservation.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Aerodrome ATM-MET (PJ.03b-06)_CC

Protocol Stack	Protocol
WS SOAP	
	SOAP 1.1 or 1.2
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
WS SOAP	
	SOAP 1.1 or 1.2
	HTTP 1.1
	TLS 1.2

Service Interface Definition	
AirportMETObservationPublisher	
Standard	**MEP, Security Configuration, Interface Bindings**

AirportMETObservationProvider.YP.WS SOAP	MEPs Supported:
	    SRR
	    PSPUSH

	PSPULL Security Configuration: Interface Binding Traceability: REQ-14.01.04-TS-0901.0790 REQ-14.01.04-TS-0901.0795 REQ-14.01.04-TS-0901.0304 REQ-14.01.04-TS-0901.0305 REQ-14.01.04-TS-0901.0325

Service Interface Definition	
AirportMETObservationSubscriber	
Standard	**MEP, Security Configuration, Interface Bindings**
AirportMETObservationProvider.YP.WS SOAP	MEPs Supported: SRR PSPUSH PSPULL Security Configuration: Interface Binding Traceability: REQ-14.01.04-TS-0901.0790 REQ-14.01.04-TS-0901.0795 REQ-14.01.04-TS-0901.0304 REQ-14.01.04-TS-0901.0305 REQ-14.01.04-TS-0901.0325

4.1.5.3.15 Interaction Controller Pilot ATC exchange(Voice).Civil and Military Aircraft (PJ02-W2-25)_CC and TWR (PJ02-W2-25)

System Port: ATC_VOICE_MFC_GND at TWR_CC

Protocol Stack	Protocol
ATC Voice (MFC) ground	
	ATS MFC R2

System Port: VOICE_RADIO_GND at Communication Infrastructure_CC

Protocol Stack	Protocol

ATC Voice (MFC) ground	
	ATS MFC R2
ATC Voice (QSIG) ground	
	ATS QSIG
ATC Voice (VoIP, control) ground	
	SIP
	TCP
	IP
ATC Voice (VoIP, media) ground	
	RTP
	UDP
	IP
OPC (Operational) Voice ground	

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: ATC_VOICE_QSIG_GND at TWR_CC

Protocol Stack	Protocol
ATC Voice (QSIG) ground	
	ATS QSIG

System Port: ATC_VOICE at Civil Aircraft (PJ.03b-06)_CC

Protocol Stack	Protocol
ATC Voice air	

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	VHF - AM 25kHz/8.33kHz
	HF - AM 25kHz

System Port: VOICE_RADIO_AIR at Communication Infrastructure_CC

Protocol Stack	Protocol
ATC Voice air	
	VHF - AM 25kHz/8.33kHz
	HF - AM 25kHz
OPC (Operational) Voice air	
	VHF
	HF (selcal)

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: ATC_VOIP_GND at TWR_CC

Protocol Stack	Protocol
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System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: ATC_VOICE_RADIO_GND at TWR_CC

Protocol Stack	Protocol
Voice Radio	

| | 4/6/8-wire E_M |

4.1.5.3.16 Interaction Coordination (Voice).Airport (PJ02-W2-25)_CC and TWR (PJ02-W2-25)_CC

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_TELEPHONE at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

System Port: VOICE_TELEPHONE at TWR (PJ.03b-06)_CC

Protocol Stack	Protocol
Voice Telephone	
	PSTN

4.1.5.3.17 Interaction Local MET Observations.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC

4.1.5.3.18 Interaction METAR.Airport (PJ02-W2-25)_CC and Aerodrome ATM-MET (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Aerodrome ATM-MET (PJ.03b-06)_CC

Protocol Stack	Protocol
WS SOAP	
	SOAP 1.1 or 1.2
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS SOAP at Airport (PJ.03b-06)_CC

Protocol Stack	Protocol
WS SOAP	
	SOAP 1.1 or 1.2
	HTTP 1.1
	TLS 1.2

Service Interface Definition	
METARPublisher	
Standard	**MEP, Security Configuration, Interface Bindings**
METARProvider.YP.WS SOAP	MEPs Supported: 　　　SRR 　　　PSPUSH 　　　PSPULL Security Configuration: Interface Binding Traceability: 　　　REQ-14.01.04-TS-0901.0790 　　　REQ-14.01.04-TS-0901.0795 　　　REQ-14.01.04-TS-0901.0304 　　　REQ-14.01.04-TS-0901.0305 　　　REQ-14.01.04-TS-0901.0325

Service Interface Definition
METARSubscriber

Standard	MEP, Security Configuration, Interface Bindings
METARProvider.YP.WS SOAP	MEPs Supported: SRR PSPUSH PSPULL Security Configuration: Interface Binding Traceability: REQ-14.01.04-TS-0901.0790 REQ-14.01.04-TS-0901.0795 REQ-14.01.04-TS-0901.0304 REQ-14.01.04-TS-0901.0305 REQ-14.01.04-TS-0901.0325

4.1.5.3.19 Interaction RunwayBrakingAction.Airport (PJ02-W2-25)_CC and Civil and Military Aircraft (PJ02-W2-25)

System Port: ACARS_RADIO_AIR at Communication Infrastructure_CC

Protocol Stack	Protocol
ACARS air (radio)	
	ARINC 618
	ARINC 622
	AVLC

System Port: AOC_ACARS at Civil Aircraft (PJ.03b-06)_CC

Protocol Stack	Protocol
ACARS air (radio)	
	ARINC 618
	ARINC 622
	AVLC
ACARS air (satcom)	
	AMSS618
	ARINC 622
	AMSS Data 2

System Port: ACARS_GND at Communication Infrastructure_CC

Protocol Stack	Protocol

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ACARS ground	
	ARINC 618
	ARINC 620
	BATAP
	MATIP
	TCP
	IP

System Port: ACARS_GND at Airport (PJ02-W2-25)_CC

Protocol Stack	Protocol
ACARS ground	
	ARINC 618
	ARINC 620
	BATAP
	MATIP
	TCP
	IP

4.1.5.3.20 Interaction RunwayBrakingAction.Airport Data Service Provider_CC and Airport (PJ02-W2-25)_CC

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS Light at Airport (PJ02-W2-25)_CC

Protocol Stack	Protocol
WS Light	
	HTTP 1.1
	TLS 1.2

System Port: IP_GND at Communication Infrastructure_CC

Protocol Stack	Protocol
IP	

System Port: WS Light at Airport Data Service Provider_CC

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Protocol Stack	Protocol
WS Light	
	HTTP 1.1
	TLS 1.2

4.2 Functional and non-Functional Requirements

4.2.1 OBACS

[REQ]

Identifier	REQ-02.25.1-TS-OBACS.0001
Title	OBACS activation

Requirement	When OBACS is installed and available, OBACS shall be active during ground part of the landing
Status	\<validated\>
Rationale	In order to monitor ground part of the landing, when the A/C is on the runway.
Category	\<Functional\>

[REQ Trace]

Relationship	Linked Element Type	Identifier
\<ALLOCATED_TO\>	\<SESAR Solution\>	PJ.02.25.1
\<SATISFIES\>	\< ATMS Requirement\>	REQ-02.25.1-SPRINTEROP-ACFT.0015
\<ALLOCATED_TO\>	\<Functional block\>	OBACS
\<ALLOCATED_TO\>	\<Function\>	Computing Braking Action
\<ALLOCATED_TO\>	\<Enabler\>	A/C-84_Braking Action Computation Function in On-board Braking Action Computation System
\<ALLOCATED_TO\>	\<System\>	AIRCRAFT TS
\<ALLOCATED_TO\>	\<Function View\>	[NSV-4] – Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-OBACS.0002
Title	OBACS friction limited braking conditions detection
Requirement	When OBACS is active, OBACS shall automatically detect if braking is anti-skid limited or not.
Status	\<validated\>
Rationale	OBACS Braking Action usage depends on friction limited braking conditions.
Category	\<Functional\>

[REQ Trace]

Relationship	Linked Element Type	Identifier

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Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0017
<ALLOCATED_TO>	<Functional block>	OBACS
<ALLOCATED_TO>	<Function>	Computing Braking Action
<ALLOCATED_TO>	<Enabler>	A/C-84_Braking Action Computation Function in On-board Braking Action Computation System
<ALLOCATED_TO>	<System>	AIRCRAFT TS
<ALLOCATED_TO>	<Function View>	[NSV-4] – Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-OBACS.0003
Title	Automatic OBACS Braking Action computation
Requirement	When OBACS is active and in its intended operational domain, OBACS shall automatically calculate the Computed Braking Action relevant for the portion of the runway the aircraft rolled on at landing.
Status	<validated>
Rationale	OBACS is autonomous to detect the conditions and execute Braking Action computation.
Category	<Functional>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0017
<ALLOCATED_TO>	<Functional block>	OBACS
<ALLOCATED_TO>	<Function>	Computing Braking Action

<ALLOCATED_TO>	<Enabler>	A/C-84_Braking Action Computation Function in On-board Braking Action Computation System
<ALLOCATED_TO>	<System>	AIRCRAFT TS
<ALLOCATED_TO>	<Function View>	[NSV-4] – Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-OBACS.0004
Title	Transparent OBACS Braking Action computation
Requirement	The OBACS computation shall be silent and run in background without need of or any interference with Flight Crew actions.
Status	<validated>
Rationale	Silent and background computation to prevent any additional workload to the crew during the landing phase.
Category	<Functional>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0017
<ALLOCATED_TO>	<Functional block>	OBACS
<ALLOCATED_TO>	<Function>	Computing Braking Action
<ALLOCATED_TO>	<Enabler>	A/C-84_Braking Action Computation Function in On-board Braking Action Computation System
<ALLOCATED_TO>	<System>	AIRCRAFT TS
<ALLOCATED_TO>	<Function View>	[NSV-4] – Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-OBACS.0005
Title	OBACS result display available to Flight crew after landing

Requirement	When OBACS Computed Braking Action is available and useful for PiREP, Flight Crew shall be able to retrieve the OBACS result on a display after landing to assist them to do a PiREP
Status	<validated>
Rationale	In order to enhance crew awareness of the braking conditions encountered during the last landing. To help pilot in addition of his/her experience to decide Braking Action to report to ATC.
Category	<Functional>, <HMI>, <Interface>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0016
<ALLOCATED_TO>	<Functional block>	OBACS
<ALLOCATED_TO>	<Function>	Aircraft Computed Braking Action dissemination
<ALLOCATED_TO>	<Functional block>	Controls & Display
<ALLOCATED_TO>	<Function>	Displays and Controls
<ALLOCATED_TO>	<Enabler>	A/C-84_Braking Action Computation Function in On-board Braking Action Computation System
<ALLOCATED_TO>	<System>	AIRCRAFT TS
<ALLOCATED_TO>	<Function View>	[NSV-4] – Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-OBACS-0006
Title	OBACS Friction Limited Braking Conditions reporting

Requirement	OBACS shall inform Computed Braking Action result users whether the computation was done in friction limited braking or not friction limited conditions
Status	<validated>
Rationale	OBACS Braking Action usage depends on friction limited braking conditions.
Category	<Functional> , <Interface>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0044
<ALLOCATED_TO>	<Functional block>	OBACS
<ALLOCATED_TO>	<Function>	Aircraft Computed Braking Action dissemination
<ALLOCATED_TO>	<Enabler>	A/C-84_Braking Action Computation Function in On-board Braking Action Computation System
<ALLOCATED_TO>	<System>	AIRCRAFT TS
<ALLOCATED_TO>	<Function View>	[NSV-4] – Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-FLCW.151
Title	Pilot Braking Action assessment
Requirement	Pilot shall perform braking action assessment after landing.
Status	<validated>
Rationale	Flight Crew assesses braking action using their experience and automatic braking action report from OBACS when available to verify whether reported runway conditions correspond to assessed braking action.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0030
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Flight Crew
<ALLOCATED_TO>	<Function>	Braking Action Pilot Assessment
<ALLOCATED_TO>	<Enabler>	A/C-84
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-OBACS-0007
Title	Automatic OBACS reporting to RCAMS
Requirement	When OBACS Computed Braking Action is available, OBACS should automatically transmit the result to RCAMS via OBACS ground server, pending Airport Operator has subscribed to OBACS service.
Status	<in progress>
Rationale	OBACS result availability for Airport Operator. A report is transmitted by the aircraft to a ground server which automatically transmit the information to be input in the Airport Operator system.
Category	<Interoperability> , <Interface>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1

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<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0078 REQ-02.25.1-SPRINTEROP-ACFT.0018
<ALLOCATED_TO>	<Functional block>	OBACS
<ALLOCATED_TO>	<Function>	Aircraft Computed Braking Action dissemination
<ALLOCATED_TO>	<Enabler>	A/C-64_Data transmission means supporting downlinked observed runway surface condition (aircraft side)
<ALLOCATED_TO>	<System>	AIRCRAFT TS
<ALLOCATED_TO>	<Function View>	[NSV-4] – Runway Condition Report Elaboration

4.2.2 RCAMS

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.62
Title	RCAMS able to detect inference failure and process the error
Requirement	RCAMS shall be able to detect inference subroutine failure.
Status	<validated>
Rationale	RCAMS needs to inform users of the failure state
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045
<ALLOCATED_TO>	<Functional Block>	RCAMS inference
<ALLOCATED_TO>	<Role>	

<ALLOCATED_TO>	<Function>	Broadcast error message to endpoints
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.63
Title	RCAMS to survive inference failure
Requirement	RCAMS shall not stop functioning when inference failure occurs
Status	<validated>
Rationale	Errors of parts of RCAMS shall not disable other parts of RCAMS without clear user instruction.
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0050
<ALLOCATED_TO>	<Functional Block>	RCAMS inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast error message to endpoints
<ALLOCATED_TO>	<Enabler>	AIRPORT-57

		AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.64
Title	RCAMS inference failure metrics
Requirement	RCAMS shall collect inference failure metrics (perceived cause, time of occurrence, severity) upon encountering inference subroutine failure
Status	<validated>
Rationale	Error metrics is necessary to commence repairs.
Category	<Maintainability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046 REQ-02.25.1-SPRINTEROP-AIOP.0047
<ALLOCATED_TO>	<Functional Block>	RCAMS inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast error message to endpoints
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59

<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.65
Title	RCAMS inference error for Airport Duty Officer
Requirement	RCAMS shall broadcast error message containing time of occurrence to Airport Duty Officer HMI when inference failure occurs
Status	<validated>
Rationale	Support Airport Duty Officer situational awareness.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046 REQ-02.25.1-SPRINTEROP-AIOP.0047
<ALLOCATED_TO>	<Functional Block>	RCAMS inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast error message to endpoints
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS

| <ALLOCATED_TO> | <Function View> | [NSV-4] Failure of RCAMS inference function |

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.66
Title	RCAMS inference error for RCAMS Admin
Requirement	RCAMS shall broadcast error message containing full error metrics information to RCAMS Admin HMI when inference failure occurs
Status	<validated>
Rationale	Necessary for correct decision making during RCAMS repairs
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046 REQ-02.25.1-SPRINTEROP-AIOP.0047
<ALLOCATED_TO>	<Functional Block>	RCAMS inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast error message to endpoints
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS

<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.67
Title	RCAMS Admin inference loss alert
Requirement	RCAMS Admin HMI shall display an appropriate status immediately upon reception of inference failure error message
Status	<validated>
Rationale	RCAMS admin warning
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046 REQ-02.25.1-SPRINTEROP-AIOP.0047
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display inference loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS

| <ALLOCATED_TO> | <Function View> | [NSV-4] Failure of RCAMS inference function |

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.68
Title	RCAMS Airport Duty Officer inference loss alert
Requirement	RCAMS Duty Officer HMI shall display an appropriate status immediately upon reception of inference failure error message.
Status	<validated>
Rationale	Support Airport Duty Officer situational awareness.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0048
<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display inference loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.69
Title	RCAMS Admin inference error alert metrics via HMI
Requirement	RCAMS Admin HMI shall enable user to access full inference subroutine error metrics upon receiving inference subroutine error message.
Status	<validated>
Rationale	Support RCAMS repair
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046 REQ-02.25.1-SPRINTEROP-AIOP.0047
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display inference loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

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Identifier	REQ-02.25.1-TS-RCDH.70
Title	Acknowledge Airport Duty Officer HMI alert
Requirement	Configured alerts and warnings generated by RCAMS Duty Officer HMI shall persist until acknowledged by HMI operator.
Status	<validated>
Rationale	Support Airport Duty Officer situational awareness.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display inference loss alert Display critical data loss alert Display data source loss warning Display Alert on significant change of runway conditions Display Alert on Aircraft Braking Action reception
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

		[NSV-4] Loss of RCAMS data source [NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.71
Title	Acknowledge Admin HMI alert
Requirement	Configured alerts and warnings generated by RCAMS Admin HMI shall persist until acknowledged by HMI operator.
Status	<validated>
Rationale	Support RCAMS Admin situational awareness
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display inference loss alert Display critical data loss alert Display data source loss warning
<ALLOCATED_TO>	<Enabler>	AIRPORT-57

		AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[NSV-4] Loss of RCAMS data source |

[REQ]

Identifier	REQ-02.25.1-TS-RCTS.72
Title	Log alerts and acknowledgments on RCAMS HMIs
Requirement	All alert and warnings displays and acknowledgments in all RCAMS HMIs shall be logged.
Status	<validated>
Rationale	Documentation of safety-critical process
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045

REQ-02.25.1-SPRINTEROP-AIOP.0055 |
| <ALLOCATED_TO> | <Functional Block> | RCAMS Duty Officer HMI

RCAMS Admin HMI

RCAMS ATCO HMI |
| <ALLOCATED_TO> | <Role> | |
| <ALLOCATED_TO> | <Function> | Display inference loss alert

Display critical data loss alert |

		Display data source loss warning
		Display Alert on significant change of runway conditions
		Display Alert on Aircraft Braking Acton reception
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function [NSV-4] Loss of RCAMS data source [NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.73
Title	RCAMS inference emergency maintenance
Requirement	After receiving RCAMS inference loss alert Airport Duty Officer and RCAMS Admin should coordinate RCAMS emergency maintenance.
Status	<validated>
Rationale	Shared situational awareness of human actors
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	

<ALLOCATED_TO>	<Role>	Airport Duty Officer RCAMS Admin
<ALLOCATED_TO>	<Function>	Initiate repairs coordination Initiate RCAMS emergency maintenance
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.74
Title	Airport Duty Officer to fall back to fully manual inspection in case of RCAMS inference failure
Requirement	Airport Duty Officer shall fall back to standard manual inspection practice after acknowledging RCAMS inference failure alert.
Status	<validated>
Rationale	Standard GRF as fall-back for Solution.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0048
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer

<ALLOCATED_TO>	<Function>	Switch to manual runway condition Monitor RWY condition manually
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.75
Title	RCAMS Inference failure not a direct cause of RCAMS Local Dissemination failure
Requirement	RCAMS Local Dissemination shall not fail as a direct result of RCAMS Inference failure
Status	<validated>
Rationale	RCAMS dissemination and inference failure independence to maintain maximum RCAMS functionality in all conditions.
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0050
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	
<ALLOCATED_TO>	<Enabler>	AIRPORT-57

		AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.76
Title	RCAMS able to detect loss of data source
Requirement	RCAMS Data Acquisition shall be able to detect loss of data source event.
Status	<validated>
Rationale	Loss of data source may severely influence RCAMS Inference output.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0031 REQ-02.25.1-SPRINTEROP-AIOP.0032 REQ-02.25.1-SPRINTEROP-AIOP.0049 REQ-02.25.1-SPRINTEROP-AIOP.0027
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Loss of Data Warning Monitor RCAMS Inputs

<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source [NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.77
Title	RCAMS data source loss metrics
Requirement	RCAMS Data Acquisition shall collect loss of data source event metrics (data source lost, time of occurrence, connection status) upon encountering loss of data source event
Status	<validated>
Rationale	Error metrics is necessary to commence repairs.
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046 REQ-02.25.1-SPRINTEROP-AIOP.0047
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Loss of Data Warning

<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.78
Title	RCAMS loss of data source warning for RCAMS Admin
Requirement	RCAMS Data Acquisition shall broadcast error message and full error metrics information shall be available via RCAMS Admin HMI when data source loss occurs
Status	<validated>
Rationale	Support RCAMS repair
Category	<Maintainability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046 REQ-02.25.1-SPRINTEROP-AIOP.0047
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Loss of Data Warning
<ALLOCATED_TO>	<Enabler>	AIRPORT-57

		AIRPORT-59 A/C-64
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.79
Title	RCAMS inference able to distinguish between critical and non-critical data
Requirement	RCAMS Inference shall be able to classify data types into critical and non-critical based on estimated inference quality loss upon reception of data loss error message
Status	<validated>
Rationale	When risk of significant decrease of RCAMS performance exists this may contribute to safety issue. Better solution is to shut down system and maintain present level of safety. Critical data absence may cause significant RCAMS performance decrease.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0049

		REQ-02.25.1-SPRINTEROP-AIOP.0027
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Estimate data source loss influence on quality
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.80
Title	RCAMS critical data loss is treated as RCAMS inference failure
Requirement	RCAMS critical data loss shall be treated as inference failure by RCAMS Inference subroutine.
Status	<validated>
Rationale	Critical data loss means potential safety decrease that needs to be avoided.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0049
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference

<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast critical data loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.81
Title	RCAMS data loss alert/warning for Airport Duty Officer HMI
Requirement	RCAMS Inference shall broadcast error message containing at least time of data loss event and type and criticality classification of data lost upon completion of the classification of the lost data.
Status	<validated>
Rationale	Airport Duty Officer situational awareness support.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0031 REQ-02.25.1-SPRINTEROP-AIOP.0032 REQ-02.25.1-SPRINTEROP-AIOP.0049
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference

<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Estimate data source loss influence on quality Broadcast critical data loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59 A/C-64
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.82
Title	RCAMS data loss alert for RCAMS Admin
Requirement	When data source loss has been classified as critical by RCAMS Inference, error message containing full error metrics information shall be logged and accessible via RCAMS Admin HMI.
Status	<validated>
Rationale	Support RCAMS repair
Category	<Maintainability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference

<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast critical data loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59 A/C-64
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.83
Title	RCAMS data loss alert display on RCAMS Admin HMI
Requirement	RCAMS Admin HMI shall display an alert (optionally with associated aural signal) immediately upon reception of critical/non-critical data loss error message
Status	<validated>
Rationale	RCAMS Admin situational awareness
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	

<ALLOCATED_TO>	<Function>	Display critical data loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59 A/C-64
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.84
Title	RCAMS data source loss alert display on Airport Duty Officer HMI
Requirement	RCAMS Duty Officer HMI shall display an alert (optionally with associated aural signal) immediately upon reception of critical/non-critical data loss error message.
Status	<validated>
Rationale	Airport Duty Officer situational awareness
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0031 REQ-02.25.1-SPRINTEROP-AIOP.0032 REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046

<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display critical data loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.87
Title	RCAMS Admin to commence maintenance in coordination with Airport Duty Officer upon any data source loss
Requirement	RCAMS Admin shall commence emergency RCAMS maintenance in coordination with Airport Duty Officer upon receiving any data source loss warning or alert
Status	<validated>
Rationale	Data source loss requires action even if temporary RCAMS output quality is not seriously degraded. Human actors should share the awareness of the non-nominal situation.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer

		RCAMS Admin
<ALLOCATED_TO>	<Function>	Initiate RCAMS maintenance coordination Initiate emergency RCAMS maintenance
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59 A/C-64
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.88
Title	RCAMS loss of data source error message for RCAMS inference
Requirement	RCAMS Data Acquisition shall inform RCAMS Inference when data source loss occurs
Status	<validated>
Rationale	RCAMS inference needs to classify data loss severity for RCAMS users
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition

<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Loss of Data Warning
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59 A/C-64
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.89
Title	RCAMS Admin data loss metrics via RCAMS Admin HMI
Requirement	RCAMS Admin HMI shall enable user to access full data source loss error metrics upon receiving data source loss error message.
Status	<validated>
Rationale	Support RCAMS repair
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Loss of Data Warning
<ALLOCATED_TO>	<Enabler>	AIRPORT-57

		AIRPORT-59
		A/C-64
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.90
Title	Permanent loss of input quality treated as data source loss
Requirement	RCAMS Data Acquisition shall treat a data source with permanently lost data quality as lost data source
Status	<validated>
Rationale	It is safe to assume that data sources displaying constant lack of quality are not useful and might cause unreliable results of RCAMS inference.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0069
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Monitor RCAMS input
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
		AIRPORT-59
		A/C-64

| <ALLOCATED_TO> | <System> | RCAMS TS |
| <ALLOCATED_TO> | <Function View> | [NSV-4] Permanent loss of RCAMS input quality |

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.91
Title	RCAMS Data Acquisition QA
Requirement	RCAMS Data Acquisition shall perform quality assessment on input data.
Status	<validated>
Rationale	Usual practice with any kind of data acquired automatically.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0069
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Monitor RCAMS input
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59 A/C-64
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Permanent loss of RCAMS input quality

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.92
Title	RCAMS local dissemination to detect failure
Requirement	RCAMS shall be able to detect local dissemination failure.
Status	<validated>
Rationale	RCAMS needs to inform users of the failure state
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Error Message
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RATH.93
Title	RCAMS ATCO HMI to detect communication failure independently
Requirement	RCAMS ATCO HMI shall be able to detect communication interrupt with the rest of RCAMS system autonomously and inform ATCO about such interruption.

Status	<validated>
Rationale	ATCO HMI is usually located in different network (stakeholder) than the rest of RCAMS.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0054
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Detect Communication interruption
<ALLOCATED_TO>	<Enabler>	AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCTS.94
Title	RCAMS to survive local dissemination failure
Requirement	RCAMS shall not stop functioning when local dissemination failure occurs
Status	<validated>
Rationale	Errors of parts of RCAMS shall not disable other parts of RCAMS without clear user instruction.
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0058 REQ-02.25.1-SPRINTEROP-ATSS.0059 REQ-02.25.1-SPRINTEROP-ATSS.0060
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Error Message
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.95
Title	RCAMS local dissemination error for Airport Duty Officer
Requirement	When local dissemination failure occurs, RCAMS Local Dissemination shall detect it and note time of occurrence.
Status	<validated>
Rationale	Support Airport Duty Officer situational awareness.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Error Message
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.96
Title	RCAMS local dissemination error for RCAMS Admin
Requirement	RCAMS Local Dissemination full error metrics information shall be available via RCAMS Admin HMI when local dissemination failure occurs.
Status	<validated>
Rationale	Necessary for correct decision making during RCAMS repairs. Support RCAMS repair
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0055

<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Error Message
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.97
Title	RCAMS local dissemination failure metrics
Requirement	RCAMS Local Dissemination shall collect local dissemination failure metrics (perceived cause, time of occurrence, severity) upon encountering local dissemination failure
Status	<validated>
Rationale	Error metrics is necessary to commence repairs.
Category	<Maintainability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast Error Message

<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.98
Title	RCAMS Admin local dissemination loss alert
Requirement	RCAMS Admin HMI shall display an alert with associated aural signal upon detection of local dissemination error.
Status	<validated>
Rationale	RCAMS admin warning
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local dissemination loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS

<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.99
Title	RCAMS Airport Duty Officer local dissemination loss alert
Requirement	RCAMS Duty Officer HMI shall display an alert with associated aural signal upon detection of local dissemination failure.
Status	<validated>
Rationale	Support Airport Duty Officer situational awareness.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local dissemination loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.101
Title	RCAMS local dissemination emergency maintenance
Requirement	After receiving RCAMS local dissemination loss alert Airport Duty Officer and RCAMS Admin should coordinate RCAMS emergency maintenance.
Status	<validated>
Rationale	Shared situational awareness of human actors
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer RCAMS Admin
<ALLOCATED_TO>	<Function>	Initiate emergency maintenance Initiate repairs coordination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.103
Title	Airport Duty Officer to establish fall-back R/T transmission of runway condition
Requirement	Upon reception of local dissemination failure alert and local dissemination failure report from Tower the Airport Duty Officer shall establish fall-back R/T transmission of RCR to the Tower.
Status	<validated>
Rationale	Failure of RCAMS will not decrease Tower awareness of runway condition compared to situation without solution implemented.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0059
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Establish fall-back R/T runway condition transmission
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.104
Title	Change of mode of runway condition requires ATCO acknowledgement.

Requirement	Before change of RCR dissemination mode the Airport Duty Officer shall obtain acknowledgement from Tower Runway Controller.
Status	<validated>
Rationale	Shared situational awareness of human actors
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0060
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Acknowledge fall-back R/T runway condition
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.106
Title	Receive data from runway built-in sensors
Requirement	RCAMS shall acquire measurements from each runway built-in sensor.
Status	<validated>
Rationale	Runway sensors data is input for RCAMS Inference to compute runway conditions.

Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Collecting RCAMS Inputs
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.107
Title	Receive ground trajectory of landed aircraft from airport surveillance radar
Requirement	RCAMS should acquire trajectory of landed aircraft from airport surveillance radar.
Status	<in progress>
Rationale	Trajectory of landed aircraft from airport surveillance radar is input for RCAMS Inference to compute runway conditions. This is dependent on local CNS capability.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Collecting RCAMS Inputs
<ALLOCATED_TO>	<Enabler>	SVC-061
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.108
Title	Receive MET forecast and nowcast
Requirement	RCAMS shall acquire MET forecast and nowcast for the airport.
Status	<validated>
Rationale	MET forecast and nowcast is input for RCAMS Inference to compute predicted runway conditions.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002

<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Collecting RCAMS Inputs
<ALLOCATED_TO>	<Enabler>	AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.109
Title	Receive local MET Observations
Requirement	RCAMS shall acquire local MET Observations (e.g. from AWOS system).
Status	<validated>
Rationale	MET Observation is input for RCAMS Inference to compute runway conditions.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Collecting RCAMS Inputs
<ALLOCATED_TO>	<Enabler>	AIRPORT-59

| <ALLOCATED_TO> | <System> | RCAMS TS |
| <ALLOCATED_TO> | <Function View> | [NSV-4] Runway Condition Report Elaboration |

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.110
Title	Receive weather radar data
Requirement	RCAMS should acquire weather radar data.
Status	<validated>
Rationale	Weather radar data is input for RCAMS Inference to compute runway conditions.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Collecting RCAMS Inputs
<ALLOCATED_TO>	<Enabler>	AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDA.111

Title	Receive METAR
Requirement	RCAMS should acquire and decode METAR message for the airport.
Status	<validated>
Rationale	Data from METAR is input for RCAMS Inference to compute runway conditions.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Data Acquisition
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Collecting RCAMS Inputs
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.112
Title	RCAMS Admin to do RCAMS Local Dissemination preliminary set up
Requirement	RCAMS Admin shall be responsible for accomplishing RCAMS Local Dissemination preliminary set-up.
Status	<validated>

Rationale	RCAMS Local Dissemination preliminary start-up is a technical process - there is no need to involve the operational staff.
Category	<Design>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0062
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	RCAMS Admin
<ALLOCATED_TO>	<Function>	Completed RCAMS Local Dissemination preliminary set-up
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.113
Title	RCAMS Admin to coordinate RCAMS local dissemination start up with Airport Duty Officer
Requirement	RCAMS Admin shall coordinate RCAMS Local Dissemination start up with Airport Duty Officer.
Status	<validated>
Rationale	Shared situational awareness of human actors
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0062
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	RCAMS Admin
<ALLOCATED_TO>	<Function>	Coordinate Airport RCAMS start-up
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.114
Title	Airport Duty Officer to coordinate RCAMS Local Dissemination start up with ATCO
Requirement	Airport Duty Officer shall coordinate RCAMS Local Dissemination start up with Tower Runway Controller.
Status	<validated>
Rationale	ATCO expect Airport Duty Officer to coordinate operational Airport activity and information exchange with Tower.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1

<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0052
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Coordinate local dissemination initiation
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.115
Title	RCAMS Local Dissemination start up requires Airport Duty Officer and ATCO acknowledgement
Requirement	RCAMS Admin shall initiate RCAMS Local Dissemination start-up once he receives acknowledgements from Airport Duty Officer and, indirectly, from Tower Runway Controller.
Status	<validated>
Rationale	Shared situational awareness of human actors and coordination of information exchange means.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier

<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0052
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	RCAMS Admin
<ALLOCATED_TO>	<Function>	Acknowledge local dissemination readiness Enable local dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.116
Title	RCAMS Admin to enable full RCAMS Local Dissemination functionality
Requirement	RCAMS Admin shall be responsible for enabling the full RCAMS Local Dissemination functionality.
Status	<validated>
Rationale	RCAMS Local Dissemination enabling is a technical process - there is no need to involve the operational staff.
Category	<Design>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1

<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	RCAMS Admin
<ALLOCATED_TO>	<Function>	Enable local dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.118
Title	RCAMS Local Dissemination connectivity status for Airport Duty Officer
Requirement	Duty Officer HMI shall be able to detect status of connectivity to RCAMS Local Dissemination.
Status	<validated>
Rationale	Keep users up to date about the status of local dissemination initiation.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	

<ALLOCATED_TO>	<Function>	Broadcast message: local dissemination on-line
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.120
Title	RCAMS Duty Officer HMI to display ready status of connectivity to RCAMS Local Dissemination.
Requirement	RCAMS Duty Officer HMI shall display an information status when connectivity to RCAMS Local Dissemination is ready.
Status	<validated>
Rationale	To inform Airport Duty Officer of RCAMS based dissemination readiness.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display message: local dissemination on-line
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59

<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RATH.121
Title	RCAMS ATCO HMI to display ready status of connectivity to RCAMS Local Dissemination.
Requirement	RCAMS ATCO HMI shall display an information status when connectivity to RCAMS Local Dissemination is ready.
Status	<validated>
Rationale	To inform ATCO of RCAMS based dissemination readiness.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0054
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display message: local dissemination on-line
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.122
Title	Airport Duty Officer to confirm Local Dissemination function
Requirement	Airport Duty Officer shall confirm with Tower Runway Controller the reception of RCAMS Local Dissemination ready message upon receiving RCAMS Local Dissemination ready message via RCAMS Duty Officer HMI.
Status	<validated>
Rationale	Before committing to RCAMS based dissemination Airport Duty Officer makes sure ATCO HMI is operable.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0053
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Confirm RCAMS Local Dissemination initiation
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.123

Title	Airport Duty Officer to use RCAMS for runway condition dissemination after Tower confirmation
Requirement	Airport Duty Officer shall use RCAMS Local Dissemination function immediately after obtaining readiness status confirmation from Tower Runway Controller.
Status	<validated>
Rationale	When Runway Condition dissemination is established via RCAMS Airport Duty Officer needs to commit to it.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Acknowledge RCAMS Local Dissemination function Start regular usage of RCAMS Local Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.124
Title	Compute current runway conditions
Requirement	RCAMS Inference shall compute based on available input data sources contaminant coverage, contaminant type and contaminant depth and assign the RWYCC for each third of each runway in compliance with GRF rules.
Status	<validated>
Rationale	GRF format as described in ICAO documents.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Computing RWY Conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.125
Title	Compute predicted RWYCC
Requirement	RCAMS Inference shall compute based on available input data sources the predicted

	RWYCCs for upcoming hour for each third of each runway to determine the trend in runway conditions.
Status	<validated>
Rationale	GRF does not set a standard for prediction of runway conditions. However, information if runway conditions are expected to get better or deteriorate is useful from operational point of view.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Computing RWY Conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.126
Title	Regularly use of the latest available inputs for the current runway conditions and computation
Requirement	RCAMS inference shall update computed current runway conditions regularly, using up to date input source data.
Status	<validated>

Rationale	Any change on current runway conditions to be detected as earlier as possible, any new inference input shall trigger a new current runway conditions calculation.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Computing RWY Conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.127
Title	Regularly use of the latest available inputs for the predicted RWYCC computation
Requirement	RCAMS inference shall update predicted RWYCC regularly, using up to date input source data (MET forecast and nowcast).
Status	<validated>
Rationale	To reflect evolution of current runway conditions and updated MET forecast and nowcast, predicted RWYCC shall be updated regularly (each XXX min. at minimum).

Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Computing RWY Conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.128
Title	Timestamp of the runway condition at Airport Duty Officer HMI
Requirement	The RCAMS shall timestamp all relevant data related to RWY conditions displayed on Airport Duty Officer HMI.
Status	<validated>
Rationale	Date & time of displayed data can be used by the Airport Operator to make decision on new Runway Condition Report publication or runway maintenance.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0005
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display relevant data related to RWY conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.129
Title	Display Runway Condition Report
Requirement	RCAMS Duty Officer HMI shall display the last, decoded Runway Condition Report.
Status	<validated>
Rationale	Runway Condition Report contains runway conditions data validated by Airport Duty Officer.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0006
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI

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<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display RCR
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RATH.130
Title	Display Runway Condition Report
Requirement	RCAMS ATCO HMI shall display the last, decoded Runway Condition Report.
Status	<validated>
Rationale	Runway Condition Report contains runway conditions data validated by Airport Duty Officer.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0019 REQ-02.25.1-SPRINTEROP-ATSS.0020 REQ-02.25.1-SPRINTEROP-ATSS.0021
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display RCR
<ALLOCATED_TO>	<Enabler>	AERODROME-ATC-31

| <ALLOCATED_TO> | <System> | RCAMS TS |
| <ALLOCATED_TO> | <Function View> | [NSV-4] Runway Condition Dissemination |

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.131
Title	Display relevant data related to RWY conditions
Requirement	RCAMS shall display relevant computed runway conditions as well as relevant measured parameters.
Status	<validated>
Rationale	In order to support Airport Duty Officer decision making, RCAMS alerts on significant change of runway conditions should be supplemented by additional data (e.g. runway temperature, freezing point, precipitation etc.)
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0003
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display relevant data related to RWY conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.132
Title	RCAMS alert on significant change of runway conditions
Requirement	If computed runway conditions differ significantly from reported runway conditions (in the last Runway Condition Report), RCAMS shall issue an alert to attract Airport Duty Officer attention and display it on HMI. Otherwise, "No Alert" shall be displayed to emphasize that RCAMS is running properly, but no significant change of runway conditions has occurred.
Status	<validated>
Rationale	Significant change is defined by GRF.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Compare computed RWY conditions to published RWY conditions Display Alert on significant change of runway conditions Display "No Alert"
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS

| <ALLOCATED_TO> | <Function View> | [NSV-4] Runway Condition Report Elaboration |

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.133
Title	RCAMS alert on predicted change of RWYCC
Requirement	If predicted RWYCC differs from reported RWYCC (in the last Runway Condition Report), RCAMS shall issue an alert to attract Airport Duty Officer attention and display it on HMI.
Status	<validated>
Rationale	Alert on predicted change of RWYCC expresses the trend of RWYCC during the next hour.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display relevant data related to RWY conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.134

Title	RCAMS alert on new Aircraft Braking Action report
Requirement	For each new Aircraft Braking Action report from OBACS system, RCAMS shall issue an alert to attract Airport Duty Officer attention
Status	<validated>
Rationale	RCAMS DUTY OFFICER HMI shall attract Airport Duty Officer attention when new Aircraft Braking Action report has been received to assess its impact on reported runway conditions.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0040
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display Alert on Aircraft Braking Action reception
<ALLOCATED_TO>	<Enabler>	A/C-64 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.135
Title	Airport Duty Officer to monitor runway conditions
Requirement	Airport Duty Officer shall monitor all information related to runway conditions, which support him

	in decision making for runway condition reporting and triggering of runway inspection or maintenance.
Status	<validated>
Rationale	Airport Duty Officer is responsible for the monitoring and subsequent reporting of runway conditions
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0019 REQ-02.25.1-SPRINTEROP-ATSS.0020
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Monitor Runway Conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration [NSV-4] Runway Clearance from any Winter Contaminant

[REQ]

Identifier	REQ-02.25.1-TS-TWRC.136
Title	ATCO to disseminate PIREP

Requirement	ATCO shall communicate to Airport Duty Officer PIREPs indicating that braking action was worse than reported.
Status	<validated>
Rationale	Airport Duty Officer is responsible for the monitoring and subsequent reporting of runway conditions. PIREPs indicating that braking action was worse than reported trigger assessment of runway conditions.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0030
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Tower Supervisor
<ALLOCATED_TO>	<Function>	PIREP-Braking Action dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.139
Title	Airport Duty Officer to coordinate runway inspection with ATCO and Airport RWY Inspection Team
Requirement	Airport Duty Officer shall coordinate runway inspection with Tower Runway Controller

	(request runway closure slot) and Airport RWY Inspection Team, who performs the runway inspection.
Status	<validated>
Rationale	ATCO expect Airport Duty Officer to coordinate operational Airport activity and information exchange with Tower. Airport RWY Inspection Team expects Airport Duty Officer to coordinate runway inspection.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0033 REQ-02.25.1-SPRINTEROP-AIOP.0034
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Request Runway Closure Slot for Runway Inspection Coordinate RWY Inspection
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.140
Title	Airport Duty Officer to receive runway inspection results
Requirement	Airport Duty Officer shall get results of each runway inspection from RWY Inspection Team, in order to assess runway conditions change.
Status	<validated>
Rationale	Airport Duty Officer is responsible for the monitoring and subsequent reporting of runway conditions. Runway inspection is considered the most objective method to assess runway conditions. It is performed on regular basis or upon request of Airport Duty Officer to confirm significant change of runway conditions indicated by RCAMS, PIREP or automatic aircraft braking action report.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0006 REQ-02.25.1-SPRINTEROP-AIOP.0029
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Get runway inspection results
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.141
Title	RCAMS function to compose RCR under the supervision
Requirement	RCAMS DUTY OFFICER HMI shall provide the Airport Operator a function to compose RCR.
Status	<validated>
Rationale	Airport Duty Officer shall report runway conditions.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0007 REQ-02.25.1-SPRINTEROP-AIOP.0008
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Prepare RCR RCR Editor
<ALLOCATED_TO>	<Enabler>	SVC-061
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.144
Title	RCAMS quality check of inputs in RCR Editor

Requirement	RCAMS should present Airport Operator quality check results on RCR Editor inputs.
Status	\<validated\>
Rationale	Quality check of RCR Editor inputs should eliminate erroneous inputs
Category	\<Functional\>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
\<ALLOCATED_TO\>	\<SESAR Solution\>	PJ.02.25.1
\<SATISFIES\>	\<ATMS Requirement\>	REQ-02.25.1-SPRINTEROP-AIOP.0007
\<ALLOCATED_TO\>	\<Functional Block\>	RCAMS DUTY OFFICER HMI
\<ALLOCATED_TO\>	\<Role\>	
\<ALLOCATED_TO\>	\<Function\>	RCR Editor
\<ALLOCATED_TO\>	\<Enabler\>	SVC-061
\<ALLOCATED_TO\>	\<System\>	RCAMS TS
\<ALLOCATED_TO\>	\<Function View\>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.145
Title	Airport Duty Officer to confirm significant change of runway conditions.
Requirement	Airport Duty Officer shall confirm significant change of runway conditions indicated by RCAMS, PIREP or automatic aircraft braking action report before proceeding to its reporting and dissemination.
Status	\<validated\>
Rationale	Runway Condition Report contains runway conditions data validated by Airport Duty Officer.

Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0006 REQ-02.25.1-SPRINTEROP-AIOP.0007 REQ-02.25.1-SPRINTEROP-AIOP.0008 REQ-02.25.1-SPRINTEROP-AIOP.0029
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Confirmation of significant change of RWY conditions
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration [NSV-4] Runway Condition Dissemination [NSV-4] Runway Clearance from any Winter Contaminant

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.146
Title	Airport Duty Officer to consider runway inspection needs.
Requirement	Airport Duty Officer shall consider the need of runway inspection when runway conditions have changed significantly.

Status	<validated>
Rationale	Airport Duty Officer is responsible for the monitoring and subsequent reporting of runway conditions. Runway inspection is considered the most objective method to assess runway conditions. It is performed on regular basis or upon request of Airport Duty Officer to confirm significant change of runway conditions indicated by RCAMS, PIREP or automatic aircraft braking action report.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0034
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.147
Title	Airport Duty Officer to assess runway maintenance needs.
Requirement	Airport Duty Officer shall assess the need of runway maintenance when runway conditions have changed significantly.
Status	<validated>

Rationale	Airport Duty Officer triggers runway maintenance.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0034
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Assess Runway Maintenance Needs
<ALLOCATED_TO>	<Enabler>	In fact originating from PANS Aerodromes
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration [NSV-4] Runway Clearance from any Winter Contaminant

[REQ]

Identifier	REQ-02.25.1-TS-ARIT.148
Title	Airport Runway Inspection Team to perform runway inspection
Requirement	Airport Runway Inspection Team performs runway inspection on regular basis or upon request of Airport Duty Officer.
Status	<validated>
Rationale	Runway inspection is performed on regular basis to monitor runway conditions or upon request of Airport Duty Officer to confirm significant change

		of runway conditions indicated by RCAMS, PIREP or automatic aircraft braking action report.
Category		<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0034
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Runway Inspection Team
<ALLOCATED_TO>	<Function>	Perform RWY Inspection
<ALLOCATED_TO>	<Enabler>	In fact originating from PANS Aerodromes
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-TWRC.149
Title	Plan RWY Closure Slot
Requirement	ATCO shall communicate to Airport Duty Officer runway closure slot for requested actions.
Status	<validated>
Rationale	ATCO shall plan runway closure slot for runway inspection or runway maintenance.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0034
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	ATCO
<ALLOCATED_TO>	<Function>	Plan RWY Closure
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration [NSV-4] Runway Clearance from any Winter Contaminant

[REQ]

Identifier	REQ-02.25.1-TS-TWRC.150
Title	PIREP processing
Requirement	ATCO shall receive PIREP from Flight Crew and communicate it to Airport Duty Officer.
Status	<validated>
Rationale	Flight Crew communicates perceived braking action to ATCO. If it does not corresponds to reported runway conditions, ATCO shall communicate the PIREP to Airport Duty Officer.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1

<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0030
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	ATCO
<ALLOCATED_TO>	<Function>	PIREP-Braking Action reception PIREP-Braking Action dissemination
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Report Elaboration

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.156
Title	RCAMS Admin to do RCAMS Inference preliminary set up
Requirement	RCAMS Admin shall be responsible for accomplishing RCAMS Inference preliminary set-up.
Status	<validated>
Rationale	RCAMS Inference preliminary start-up is a technical process - there is no need to involve the operational staff.
Category	<Design>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051

<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	RCAMS Admin
<ALLOCATED_TO>	<Function>	Completed RCAMS Inference preliminary set-up
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	Requirements for [NSV-4] Enabling of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.157
Title	RCAMS Admin to coordinate RCAMS Inference start up with Airport Duty Officer
Requirement	RCAMS Admin shall coordinate RCAMS Inference start up with Airport Duty Officer.
Status	<validated>
Rationale	Shared situational awareness of human actors
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	RCAMS Admin
<ALLOCATED_TO>	<Function>	Coordinate RCAMS Inference start-up

		Acknowledge RCAMS monitoring readiness
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	Requirements for [NSV-4] Enabling of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCAD.158
Title	RCAMS Admin to enable full RCAMS Inference functionality
Requirement	RCAMS Admin shall be responsible for enabling the full RCAMS Inference functionality.
Status	<validated>
Rationale	RCAMS Inference enabling is a technical process - there is no need to involve the operational staff.
Category	<Design>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	RCAMS Admin
<ALLOCATED_TO>	<Function>	Initiate RCAMS Inference
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59

<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	Requirements for [NSV-4] Enabling of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.159
Title	RCAMS Admin HMI to enable control over RCAMS Inference to the user
Requirement	RCMS Admin HMI shall enable user full control over RCAMS Inference functionality.
Status	<validated>
Rationale	Necessary to realise RCAMS Admin tasks
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Initiate RCAMS Inference
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	Requirements for [NSV-4] Enabling of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCIN.160
Title	RCAMS Inference ready message for Airport Duty Officer
Requirement	RCAMS Inference shall send full readiness message to RCAMS Duty Officer HMI once the full functionality is achieved.
Status	<validated>
Rationale	Keep users up to date about the status of RCAMS Inference initiation.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	RCAMS Inference
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast message: RCAMS Inference active
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	Requirements for [NSV-4] Enabling of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.161

Title	RCAMS Duty Officer HMI display RCAMS Inference ready status
Requirement	RCAMS Duty Officer HMI shall display an information status when RCAMS Inference reports that it is ready.
Status	<validated>
Rationale	To inform Airport Duty Officer of RCAMS Inference readiness.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display message: RCAMS Inference active
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	Requirements for [NSV-4] Enabling of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.162
Title	Airport Duty Officer to confirm with RCAMS Admin RCAMS inference status

Requirement	Airport Duty Officer shall confirm with RCAMS Admin RCAMS Inference active status upon receiving RCAMS Inference ready status message.
Status	<validated>
Rationale	Partial delegation of runway monitoring tasks requires confirmation of the system status.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer RCAMS Admin
<ALLOCATED_TO>	<Function>	Confirm RCAMS Inference activation Acknowledge RCAMS Inference Activation
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	Requirements for [NSV-4] Enabling of RCAMS inference function

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.163
Title	Airport Duty Officer to coordinate runway maintenance with ATCO and Airport Winter Service Team

Requirement	Airport Duty Officer shall coordinate runway maintenance with Tower Runway Controller (request runway closure slot) and Airport Winter Service Team, who performs the runway cleaning.
Status	<validated>
Rationale	ATCO expect Airport Duty Officer to coordinate operational Airport activity and information exchange with Tower. Airport Winter Service Team expects Airport Duty Officer to coordinate runway cleaning to get better runway conditions.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0033
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Request Runway Closure Slot for runway maintenance Coordinate RWY Decontamination
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Clearance from any Winter Contaminant

[REQ]

EUROPEAN PARTNERSHIP

Co-funded by the European Union

Identifier	REQ-02.25.1-TS-AWST.164
Title	Airport Winter Service Team to perform runway decontamination
Requirement	Airport Winter Service Team should prioritise treatment of areas requested by Airport Duty Officer.
Status	<validated>
Rationale	Runway maintenance is performed upon request of Airport Duty Officer to improve runway conditions. That includes chemical treatment or mechanic removal of contaminants (plowing or sweeping) according to type of contaminant.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0033
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Winter Service Team
<ALLOCATED_TO>	<Function>	Perform RWY Decontamination
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Clearance from any Winter Contaminant

[REQ]

Identifier	REQ-02.25.1-TS-APOC.165
Title	Receive Runway Condition Report

Requirement	APOC may receive each Runway Condition Report disseminated locally at the Airport.
Status	<in progress>
Rationale	Runway Condition Report contains runway conditions data validated by Airport Duty Officer.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0007
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Update AOP
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	APOC
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-DUOF.167
Title	Validate Runway Condition Report
Requirement	Airport Duty Officer shall validate Runway Condition Report prior to its dissemination.
Status	<validated>
Rationale	Runway Condition Report contains runway conditions data validated by Airport Duty Officer.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0029 REQ-02.25.1-SPRINTEROP-AIOP.0006
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Airport Duty Officer
<ALLOCATED_TO>	<Function>	Validate RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.168
Title	Airport Duty Officer initiates RCR dissemination via RCAMS DUTY OFFICER HMI.
Requirement	There is direct button to on Airport Duty Officer HMI to disseminate validated Runway Condition Report.
Status	<validated>
Rationale	RCAMS shall provide Airport Duty Officer with both functionalities related to runway conditions reporting: composing of RCR and its dissemination.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0007
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Initiate RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.170
Title	RCAMS Local Dissemination to send Current Runway Condition local Airport recipients
Requirement	RCAMS Local Dissemination should send Current Runway Condition to necessary local Airport recipients using a pre-configured format and protocol
Status	<validated>
Rationale	Airport actors awareness of runway condition
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0007
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination

<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.171
Title	RCAMS Local Dissemination to send Current Runway Condition to APOC
Requirement	RCAMS Local Dissemination may send Current Runway Condition to APOC.
Status	<in progress>
Rationale	If APOC is present the runway condition information may be useful to them.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0007
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS

| <ALLOCATED_TO> | <Function View> | [NSV-4] Runway Condition Dissemination |

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.172
Title	RCAMS Local Dissemination local Airport recipients configuration
Requirement	RCAMS should allow configuration of local Airport recipients list of Runway Condition (predicted and current) reports sent by RCAMS Local Dissemination
Status	<validated>
Rationale	Airport actors awareness of runway condition
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.175
Title	RCAMS Local Dissemination to send Predicted Runway Condition local Airport recipients
Requirement	RCAMS Local Dissemination should send Predicted Runway Condition to necessary local Airport recipients using a pre-configured format and protocol
Status	<validated>
Rationale	Airport actors awareness of runway condition
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.176
Title	RCAMS Local Dissemination to send Predicted Runway Condition to APOC

Requirement	RCAMS Local Dissemination may send Predicted Runway Condition to APOC.
Status	<in progress>
Rationale	If APOC is present the runway condition information may be useful to them.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0009
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCND.177
Title	RCR send to AIS
Requirement	RCAMS Non local Dissemination shall enable sending Runway Condition Report to AIS according to local ANSP format and protocol requirements.
Status	<in progress>

Rationale	AIS processes RCR, prepares and disseminates SNOWTAM based on information in RCR.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0039
<ALLOCATED_TO>	<Functional Block>	RCAMS Non local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Send RCR to AIS
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-FOPC.181
Title	SWIM RCR to Flight Operation Centre
Requirement	RCAMS Non local Dissemination may enable dissemination of RCR to Flight Operation Centre via SWIM.
Status	<in progress>
Rationale	Flight Operation Centre uses RCR in process of flight briefing preparation.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0043
<ALLOCATED_TO>	<Functional Block>	RCAMS Non local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Release SWIM RCR Equivalent
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-FOPC.182
Title	Flight briefing preparation
Requirement	Flight Operation Centre shall prepare fllight briefing considering runway conditions.
Status	<in progress>
Rationale	
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1

<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0043
<ALLOCATED_TO>	<Functional Block>	Flight Operation Centre
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Prepare Flight Briefing
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-FOPC.183
Title	Provide Flight briefing to Flight Crew
Requirement	Flight Operation Centre shall provide flight briefing to Flight Crew.
Status	<in progress>
Rationale	
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0043
<ALLOCATED_TO>	<Functional Block>	Flight Operation Centre
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Flight Briefing provision

<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-APPC.185
Title	RCR for APP Controller
Requirement	RCAMS Non local Dissemination should disseminate validated Runway Condition (current and tendency information) to Approach Controller.
Status	<in progress>
Rationale	
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0019 REQ-02.25.1-SPRINTEROP-ATSS.0020
<ALLOCATED_TO>	<Functional Block>	RCAMS Non local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Non-local RCR dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57

		AIRPORT-58
		AIRPORT-59
		SVC-061
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-APPC.186
Title	Communicate Runway conditions to Flight Crew
Requirement	Approach Controller shall communicate runway conditions from ATIS and RCR to Flight Crew.
Status	<in progress>
Rationale	
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0023
<ALLOCATED_TO>	<Functional Block>	Approach Controller
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Communicate runway conditions to Flight Crew
<ALLOCATED_TO>	<Enabler>	This is a result of standard practice, not an enabler in SESAR
<ALLOCATED_TO>	<System>	

| <ALLOCATED_TO> | <Function View> | [NSV-4] Runway Condition Dissemination |
| | | [NSV-4] Landing Preparation, Descent and Landing Roll |

[REQ]

Identifier	REQ-02.25.1-TS-RATH.187
Title	RCAMS ATCO HMI to issue alert on new RCR
Requirement	RCAMS ATCO HMI shall issue an alert when new RCR is received from Airport Duty Officer.
Status	<validated>
Rationale	Alert on new RCR should attract ATCO´s attention that runway conditions have changed.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0021
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Alert ATCO on new RCR
<ALLOCATED_TO>	<Enabler>	AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RATH.190

Title	RCAMS Local Dissemination delay
Requirement	RCAMS ATCO HMI shall display updated Runway Condition information at most 30 s after confirmation by the Airport Duty Officer.
Status	<validated>
Rationale	RCAMS dissemination not slower than R/T update
Category	<Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0021
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display RCR
<ALLOCATED_TO>	<Enabler>	AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-TWRC.195
Title	Communicate runway conditions to Flight Crew
Requirement	ATCO shall communicate runway conditions to Flight Crew (via ATIS, R/T runway briefing).
Status	<in progress>
Rationale	
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0022 REQ-02.25.1-SPRINTEROP-ATSS.0023
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	ATCO
<ALLOCATED_TO>	<Function>	Communicate runway conditions to Flight Crew
<ALLOCATED_TO>	<Enabler>	Standard operational practice.
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-TWRC.196
Title	Update ATIS
Requirement	ATCO shall update ATIS whenever new RCR is received from Airport Duty Officer.
Status	<in progress>
Rationale	
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0022
<ALLOCATED_TO>	<Functional Block>	

<ALLOCATED_TO>	<Role>	ATCO
<ALLOCATED_TO>	<Function>	ATIS Update and publication
<ALLOCATED_TO>	<Enabler>	Implementation of GRF to AIS – nothing important for solution 25.1
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-FLCW.197
Title	Flight Crew to receive runway conditions information
Requirement	Flight Crew need to have all available information including runway conditions data.
Status	<validated>
Rationale	Support decision making
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-FLCR.0014 REQ-02.25.1-SPRINTEROP-ATSS.0023
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Flight Crew
<ALLOCATED_TO>	<Function>	Retrieve Runway Conditions
<ALLOCATED_TO>	<Enabler>	Standard operational practice.
<ALLOCATED_TO>	<System>	

| <ALLOCATED_TO> | <Function View> | [NSV-4] Runway Condition Dissemination |

[REQ]

Identifier	REQ-02.25.1-TS-FLCW.198
Title	Flight Crew to process runway conditions data
Requirement	Flight Crew shall consider runway conditions data during landing or take-off.
Status	<validated>
Rationale	Support decision making
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-FLCR.0014
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Flight Crew
<ALLOCATED_TO>	<Function>	Proceed to Take-off Preparation and Execution Proceed to Landing Preparation and Execution
<ALLOCATED_TO>	<Enabler>	Standard operational practice.
<ALLOCATED_TO>	<System>	
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCND.199

Title	RCR send to Flight Crew
Requirement	RCAMS Non-local Dissemination may enable dissemination of RCR for Flight Crew via SWIM
Status	<in progress>
Rationale	Direct reception of RCR by Flight Crew is more beneficial than via ATCO or FOC.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0043
<ALLOCATED_TO>	<Functional Block>	RCAMS Non local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Release SWIM RCR Equivalent
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCND.200
Title	Limited AIS dissemination
Requirement	RCAMS Non-local Dissemination should send to AIS only those RCR that require conversion to SNOWTAM.
Status	<in progress>

Rationale	Not all RCR require conversion to SNOWTAM and AIS is interested in publishing SNOWTAM.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0038 REQ-02.25.1-SPRINTEROP-AIOP.0039
<ALLOCATED_TO>	<Functional Block>	RCAMS Non-local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Send RCR to AIS
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.202
Title	RCAMS DUTY OFFICER HMI RCR-SNOWTAM conversion
Requirement	RCAMS Duty Officer HMI shall allow marking a Runway Condition Report to be converted to SNOWTAM.
Status	<validated>
Rationale	RCR converted to SNOWTAM requires more rigorous treatment.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0037 REQ-02.25.1-SPRINTEROP-AIOP.0038 REQ-02.25.1-SPRINTEROP-AIOP.0039
<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Initiate RCR dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-59
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

4.2.3 ROAAS

[REQ]

Identifier	REQ-02.25.1-TS-ROAAS.0001
Title	ROAAS extension to any RWYCC values for Advanced ROAAS
Requirement	ROAAS should provide accommodation for RWYCC value on the runway surfaces
Status	<in progress>
Rationale	A/C may be equipped with ROAAS allowing for use with all RWYCC values.
Category	<Functional>, <Interface>, <HMI>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0041
<ALLOCATED_TO>	<Role>	Flight Crew
<ALLOCATED_TO>	<Function>	ROAAS Setup
<ALLOCATED_TO>	<Functional block>	CONTROLS & DISPLAY
<ALLOCATED_TO>	<Function>	Displays and Controls
<ALLOCATED_TO>	<Functional block>	ROAAS
<ALLOCATED_TO>	<Function>	Assess A/C stopping capability from decision height to stop point
<ALLOCATED_TO>	<Enabler>	A/C-73 Energy monitoring system during approach and landing to avoid runway excursion
<ALLOCATED_TO>	<System>	Aircraft TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Landing Preparation, Descent and Landing Roll

[REQ]

Identifier	REQ- 02.25.1-TS-ROAAS.0002
Title	Standard development of ROAAS system
Requirement	ROAAS system shall be developed according to ED-250, superseded by applicable Certification Review Item emitted by Airworthiness Authorities if any
Status	<in progress>
Rationale	ED-250 and CRI
Category	<Functional>, <Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	< ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ACFT.0041
<ALLOCATED_TO>	<Role>	Flight Crew

<ALLOCATED_TO>	<Function>	ROAAS Setup Monitor A/C stopping capability
<ALLOCATED_TO>	<Functional block>	CONTROLS & DISPLAY
<ALLOCATED_TO>	<Function>	Displays and Controls
<ALLOCATED_TO>	<Functional block>	ROAAS
<ALLOCATED_TO>	<Function>	Assess A/C stopping capability from decision height to stop point
<ALLOCATED_TO>	<Functional block>	ALERTING
<ALLOCATED_TO>	<Function>	Alerts
<ALLOCATED_TO>	<Enabler>	A/C-73 Energy monitoring system during approach and landing to avoid runway excursion
<ALLOCATED_TO>	<System>	Aircraft TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Landing Preparation, Descent and Landing Roll

5 Recommendation for Implementation

Complete configuration : RCC-4 here below.

But configuration may be partial:

- RCC-1 Runway condition awareness management system (RCAMS) based on manual assessment of contamination, weather information and runway sensors,
- RCC-2 RCAMS in RCC-1 conf completed by Surveillance input data to assess runway condition,
- - RCC-3 RCAMS RCC-1 configuration completed by OBACS input,
- - RCC-4 RCAMS RCC-2 configuration completed by OBACS input.

The following implementation options have been identified for the solution, based on the discussion during safety workshops:

5.1 Only RCAMS implemented

In this scenario, RCAMS system is deployed while the traffic present at the airport is not equipped with any of the on-board systems that are proposed in the solution. In this case, the mode of operations of the Flight Crew is unchanged while the solution supports the Airport Operator by providing continuous awareness of runway condition.

In this option, TWR Controller is critical for successful and rapid Runway Condition dissemination.

5.2 On-board systems with no RCAMS – ROAAS only equipped A/C

In this case, it is assumed that traffic equipped with solution on-board systems (ROAAS) is using airport not equipped with RCAMS. The Airport operator uses default GRF procedures to determine and disseminate Runway Condition.

5.3 Full solution implementation

This is the option where all solution systems cooperate (both airborne and ground). In this option, TWR Controller is critical for successful and rapid Runway Condition dissemination.

6 Assumptions

This section describes assumptions that have been made with regard to the requirements described in section 4.2 of this document.

6.1 Assumptions with respect to other SESAR solutions

Solution PJ.02-W2-25.1 provides inputs to other SESAR solutions (or more generally ATM systems consuming Runway Condition).

PJ.02-W2-25.1_ASSUMPTION_0001: PJ03b-06 Wave 1 solution is the starting point of PJ02-25 Solution for Wave 2.

6.2 Safety and Security assumptions

6.2.1 Safety assumptions

PJ.02-W2-25.1_ASSUMPTION_0002: It is assumed that RCAMS has been developed in line with the data protection standards and regulations.

PJ.02-W2-25.1_ASSUMPTION_0003: [placeholder] Assumption regarding safety severity of event: Computed Current RWYCC higher than reality.

PJ.02-W2-25.1_ASSUMPTION_0004: The Computed Braking Action communicated through PIREP is a secondary information, which means it can only be used to downgrade the runway condition. Therefore, the only possible safety impact if Computed Braking Action is higher than reality is that Runway Condition Code will not be as downgraded as it should.

6.2.2 Security Assumptions

PJ.02-W2-25.1_ASSUMPTION_0005: The airport maintains a high level of surveillance on its soil and on its network that ensures the data transmitted to the aircraft is not corrupted.

PJ.02-W2-25.1_ASSUMPTION_0006: The radiolink between the aircraft and ATC is safe, meaning no other actor can mislead PIREP.

6.3 Technical Assumptions

PJ.02-W2-25.1_ASSUMPTION_0007: STD-090 enabler in use. ICAO Global Reporting Format implemented (applicable from November 2021).

PJ.02-W2-25.1_ASSUMPTION_0008: [placeholder] Assumption regarding performance impact of event: Computed Current RWYCC lower than reality.

PJ.02-W2-25.1_ASSUMPTION_0009: [placeholder] Assumption regarding desired quality of predicted RWYCC/runway condition.

PJ.02-W2-25.1_ASSUMPTION_0010: Every enabler is supposed to be in a normal functioning mode, with no failures detected prior to approach and during landing and take-off roll. Data coming from aircraft sensors is supposed to be reliable and representative of reality.

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7 References and Applicable Documents

7.1 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, Ed. 02.01, May 2020

Safety

[26] SESAR, Safety Reference Material, Edition 4.01, December 2018

[27] SESAR, Guidance to Apply the Safety Reference Material, Edition 3.01, December 2018

[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)

7.2 Reference Documents

[37] ED-78A GUIDELINES FOR APPROVAL OF THE PROVISION AND USE OF AIR TRAFFIC SERVICES SUPPORTED BY DATA COMMUNICATIONS. [11]

[38] SESAR1 Project P12.01.07 D30, Airport Technical Architecture Description, ed. 00.02.00, 17/06/2016.

[39] SESAR Solution PJ.02-W2-25.1 – V3 SPR-INTEROP/OSED - Part I

[40] SESAR Solution PJ.02-W2-25.1 – V3 SPR-INTEROP/OSED - Part II SAR

[41] SESAR Solution PJ.02-W2-25.1 – V3 SPR-INTEROP/OSED – Part IV HPAR

[42] Review of aeroplane performance requirements for commercial air transport operations, Notice of Proposed Amendment 2016-11 - EASA – 30.09.2016.

[43] Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual - ICAO Doc 9830 AN/452 – First Edition – 2004.

[44] Procedures for Air Navigation Services — Aerodromes (PANS-Aerodromes) – 2nd edition – ICAO Doc 9981 – 2016.

[45] Runway Excursions Analysis Report 2004-2009 – IATA – RERR 2nd edition – 2011.

[46] Runway Surface Condition Assessment, Measurement and Reporting – ICAO Cir 329 AN/191 – January 2012.

[47] Annex 6 to the Convention on International Civil Aviation (Operation of Aircraft), Part I – International Commercial Air Transport – Aeroplanes, 11th edition – ICAO – July 2018.

[48] Annex 8 to the Convention on International Civil Aviation (Airworthiness of Aircraft), 12th edition – ICAO - 2018.

[49] Annex 14 to the Convention on International Civil Aviation (Aerodromes), Volume I – Aerodrome Design and Operations, 8th edition – ICAO – July 2018.

[50] European Action Plan for the Prevention of Runway Excursions (EAPPRE), Edition 1.0, January 2013

[51] Mitigating the Risks of a Runway Overrun Upon Landing - FAA AC 91-79A – September 2014.

[52] Landing Performance Data for Time-of-Arrival Landing Performance Assessments – FAA AC 25-32 –December 2015.

[53] Safety Report 2019 – IATA – April 2020.

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[54] A Study of Runway Excursions from a European Perspective – EUROCONTROL – March 2010.

[55] Take Off and Landing Performance Assessment (TALPA) Initiative by the FAA.

[56] PJ.02-W2-25.1 V3 VALR

[57] Annex 15 to the Convention on International Civil Aviation (Aeronautical Information Services), 16th edition – ICAO – 2018.

[58] Runway Surface Condition Assessment, Measurement and Reporting – ICAO Cir 355 AN/211 – 2018.

[59] ED-250 Minimum Operational Performance Specification (MOPS) for a Runway Overrun Awareness and Alerting System.

[60] Runway safety - Notice of Proposed Amendment 2018-14 – December 2018

[61] SESAR Solution PJ.03b-06 TS-IRS for V2 – Edition: 00.01.00, 30/09/2019

[62] Commission Implementing Regulation (EU) 2019/1387 - August 2019

[63] Commission Implementing Regulation (EU) 2020/469 - February 2020

[64] Council Decision (EU) 2020/767 - June 2020

[65] Commission Implementing Regulation (EU) 2020/1176 - August 2020

[66] Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM), ICAO Doc 4444

[67] Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM) ICAO Doc 10066

[68] ICAO EUR NAT: Guidance on the Issuance of SNOWTAM (1st. ed., 2020)

[69] ICAO Doc 10064 Aeroplane Performance Manual.

[70] Runway safety - Notice of Proposed Amendment 2016-12

[71] Runway safety - Notice of Proposed Amendment 2018-12

[72] PJ.03b-06 V2 VALR

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Appendix A   Service Description Document (SDD)

RunwayConditionR
eport.docx

RunwayBrakingActi
on.docx

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Appendix B   Requirements Management

B.1 Deleted Requirements

REQ]

Identifier	REQ-02.25.1-TS-RCAH.85
Title	RCAMS loss of data source warning display on RCAMS Admin HMI
Requirement	RCAMS Admin HMI shall display a warning immediately upon reception of data loss error message
Status	<in progress>
Rationale	RCAMS Admin situational awareness
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display data source loss warning
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-60 AIRPORT-63
<ALLOCATED_TO>	<System>	RCAMS TS

<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.86
Title	RCAMS data source loss warning display on Airport Duty Officer HMI
Requirement	RCAMS Duty Officer HMI shall display a warning immediately upon reception of data loss error message
Status	<in progress>
Rationale	Airport Duty Officer situational awareness
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0031 REQ-02.25.1-SPRINTEROP-AIOP.0032 REQ-02.25.1-SPRINTEROP-AIOP.0045 REQ-02.25.1-SPRINTEROP-AIOP.0046
<ALLOCATED_TO>	<Functional Block>	RCAMS Duty Officer HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display data source loss warning
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-60

		AIRPORT-63
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Loss of RCAMS data source

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.100
Title	RCAMS Admin local dissemination error alert metrics via HMI
Requirement	RCAMS Admin HMI shall enable user to access full local dissemination error metrics upon receiving local dissemination error message.
Status	<in progress>
Rationale	Support RCAMS repair
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051 REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local dissemination loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-60 AIRPORT-62

		AIRPORT-63
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.117
Title	RCAMS Admin HMI to enable control over RCAMS Local Dissemination to the user
Requirement	RCMS Admin HMI shall enable user full control over RCAMS Local Dissemination functionality.
Status	<in progress>
Rationale	Necessary to realise RCAMS Admin tasks
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Completed RCAMS Local Dissemination preliminary set-up Enable local dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-60 AIRPORT-62

		AIRPORT-63 AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.142
Title	Runway Condition Report Editor
Requirement	RCAMS DUTY OFFICER HMI shall contain Runway Condition Report Editor.
Status	<in progress>
Rationale	Runway Condition Report according to GRF.
Category	<HMI>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0007 REQ-02.25.1-SPRINTEROP-AIOP.0008
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	RCR Editor
<ALLOCATED_TO>	<Enabler>	AIRPORT-62
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCDH.143
Title	Runway Condition Report Editor pre-filled by computed runway conditions
Requirement	Runway Condition Report Editor can be accessible from display with computed runway condition data and respective alerts. After Airport Duty Officer opens the editor, computed runway condition data are pre-filled in respective field of RCR.
Status	<in progress>
Rationale	Runway Condition Report preparation can be triggered by runway conditions calculated by RCAMS. In this case, pre-filled editor significantly speeds up the process of RCR composition. However, all data has to be validated and can be modified by Airport Duty Officer.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0005 REQ-02.25.1-SPRINTEROP-AIOP.0007 REQ-02.25.1-SPRINTEROP-AIOP.0008
<ALLOCATED_TO>	<Functional Block>	RCAMS DUTY OFFICER HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	RCR Editor
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-60 AIRPORT-62

		AIRPORT-63
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-APOC.166
Title	Update AOP after new RCR is received
Requirement	APOC may update AOP considering runway condition data from received Runway Condition Report.
Status	<in progress>
Rationale	Runway Condition Report contains runway conditions data validated by Airport Duty Officer, which may affect AOP.
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0007
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Update AOP
<ALLOCATED_TO>	<Enabler>	Not really related to SOL 25.1
<ALLOCATED_TO>	<System>	APOC
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.173
Title	RCAMS Local Dissemination local Airport recipients configurable format and protocol
Requirement	RCAMS Admin HMI should allow user the custom configuration of protocol and format used for local Airport recipients of Runway Condition (predicted and current) reports sent by RCAMS Local Dissemination
Status	<in progress>
Rationale	RCAMS to be adjusted to local protocols.
Category	<HMI>

[REQ Trace]

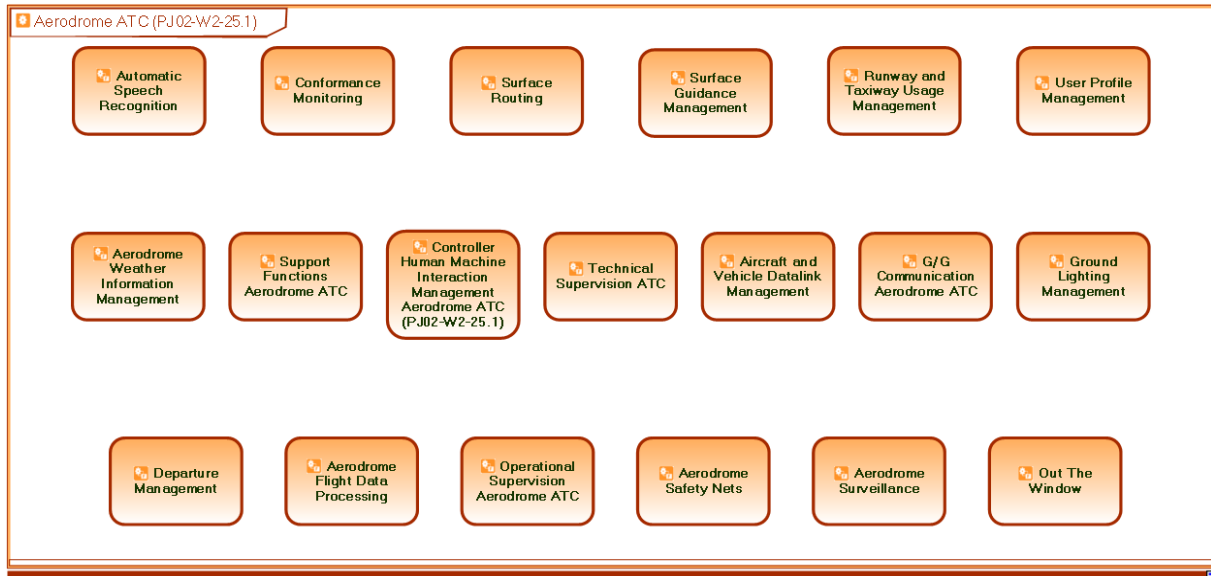| Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0001 REQ-02.25.1-SPRINTEROP-AIOP.0002
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-59 AIRPORT-60 AIRPORT-62
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

Appendix C   Modified System Views

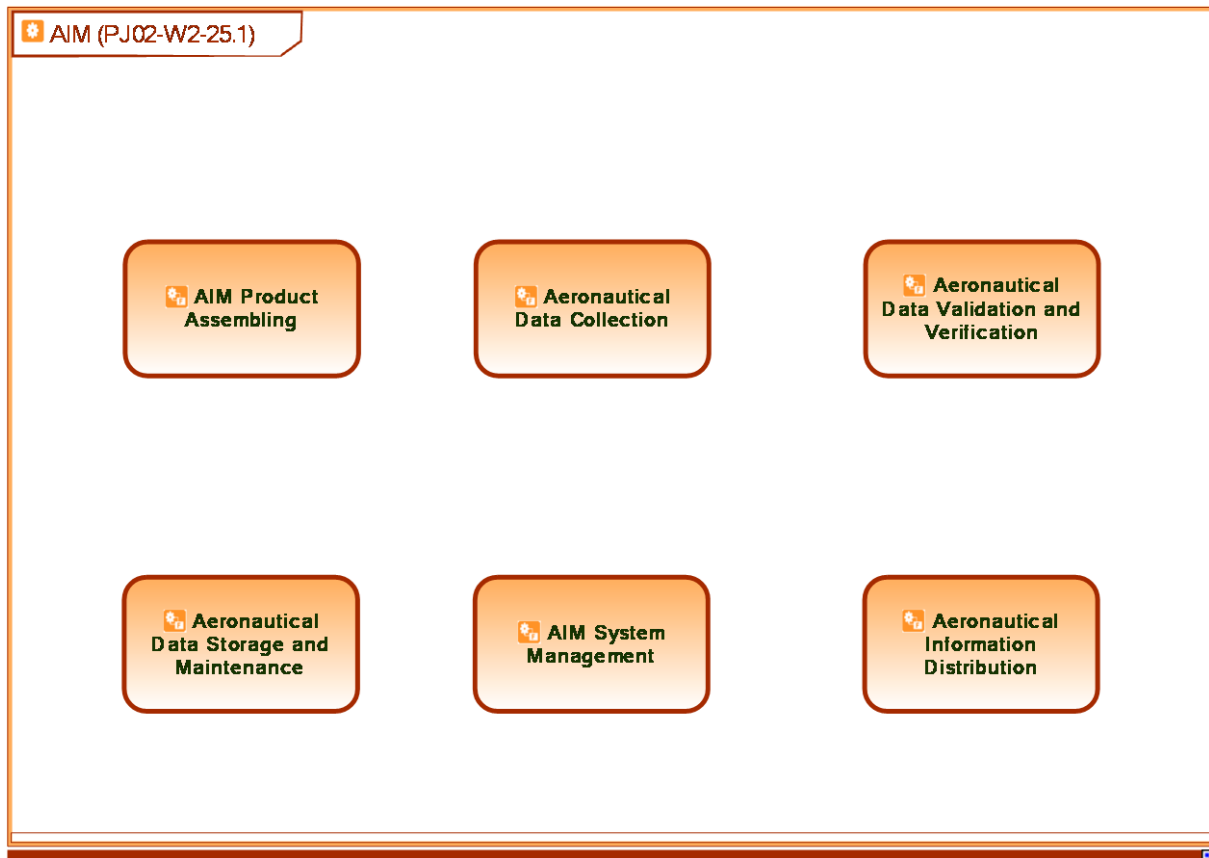## C.1 Aerodrome ATC

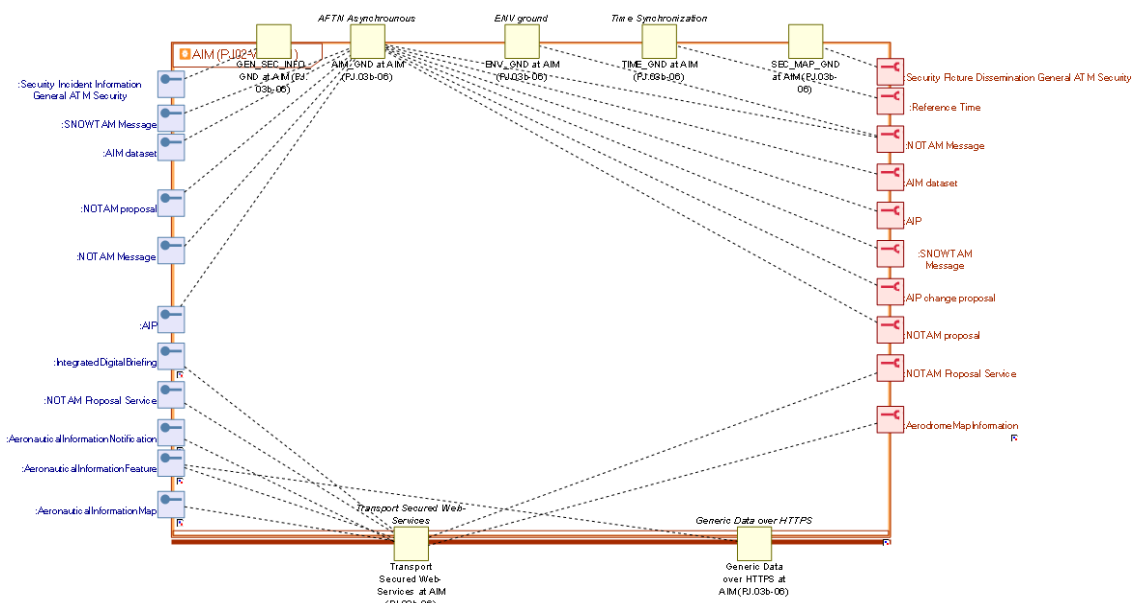**Figure 16 : Aerodrome ATC System Ports View**

Figure 17 : Aerodrome ATC Interfaces View

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C.2 AIM TS

Figure 18 : AIM TS System View

Figure 19 : AIM TS Interfaces View

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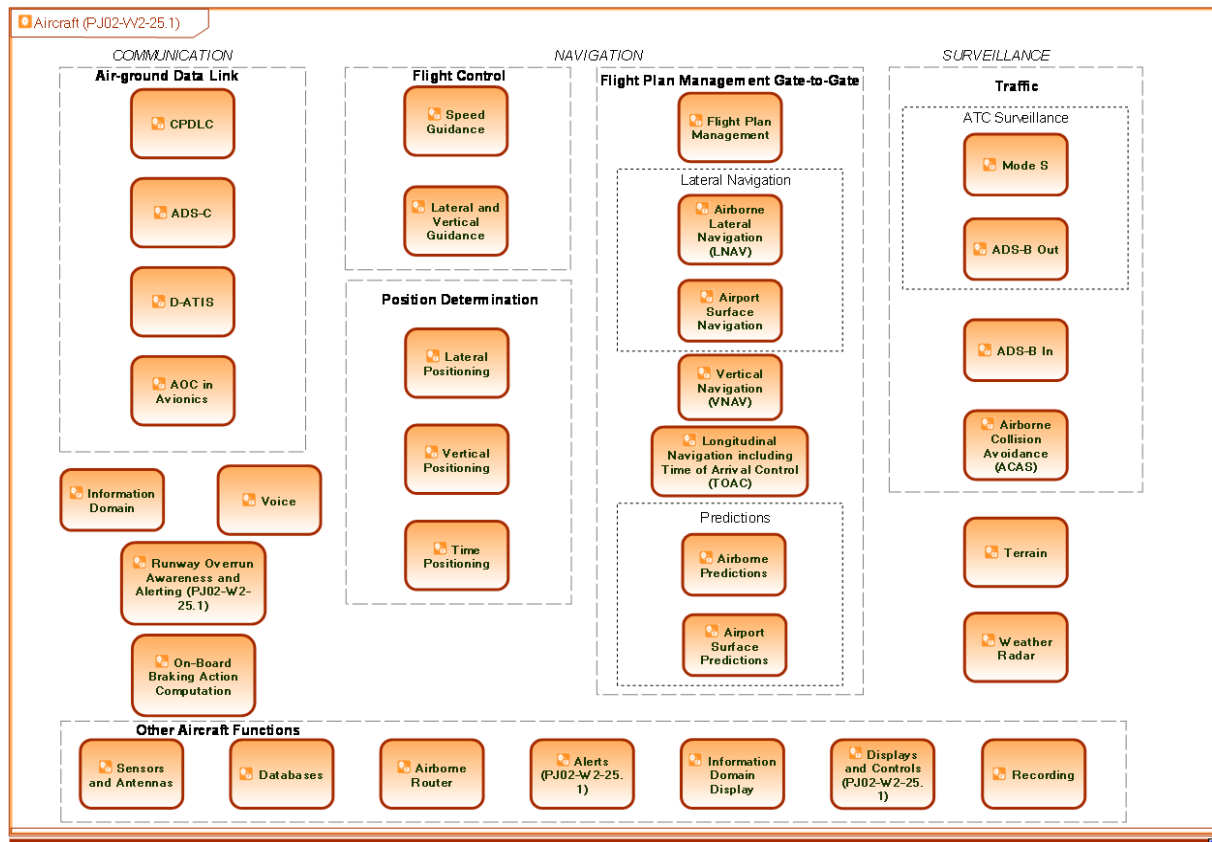
C.3 Aircraft TS

Figure 20 : Aircraft TS Composition View
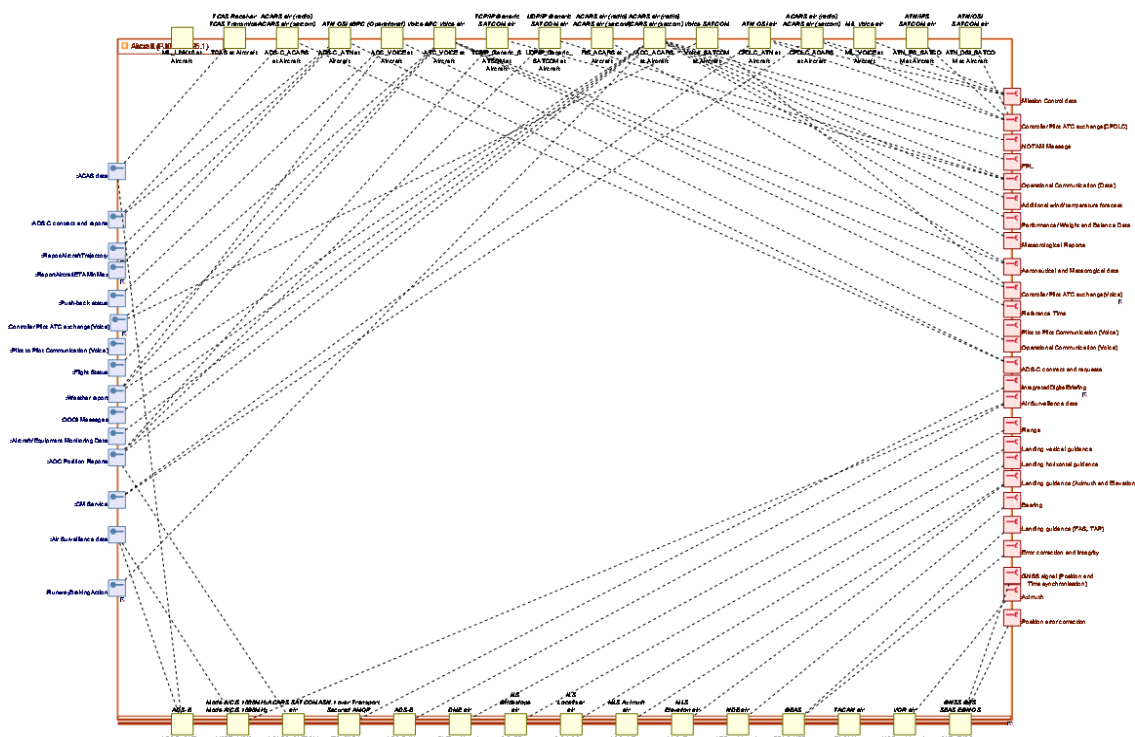
Figure 21 : Aircraft TS Interfaces View

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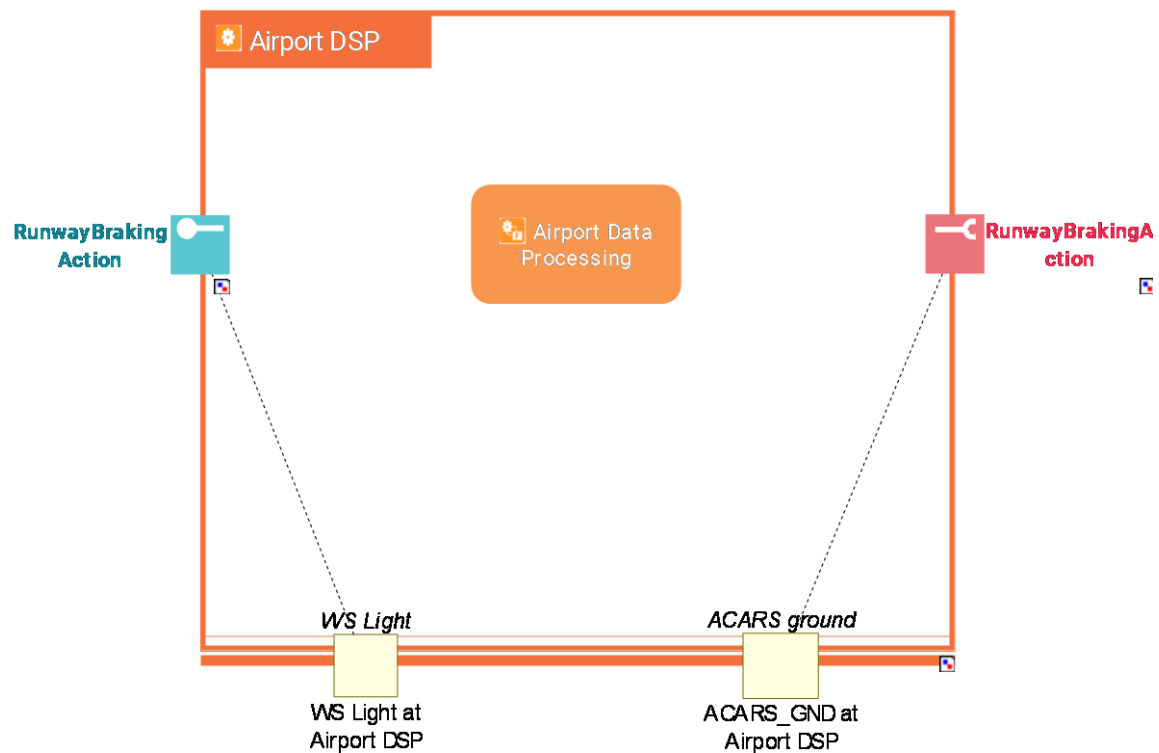
C.4 Airport DSP

Figure 22 : Airport DSP Interfaces View

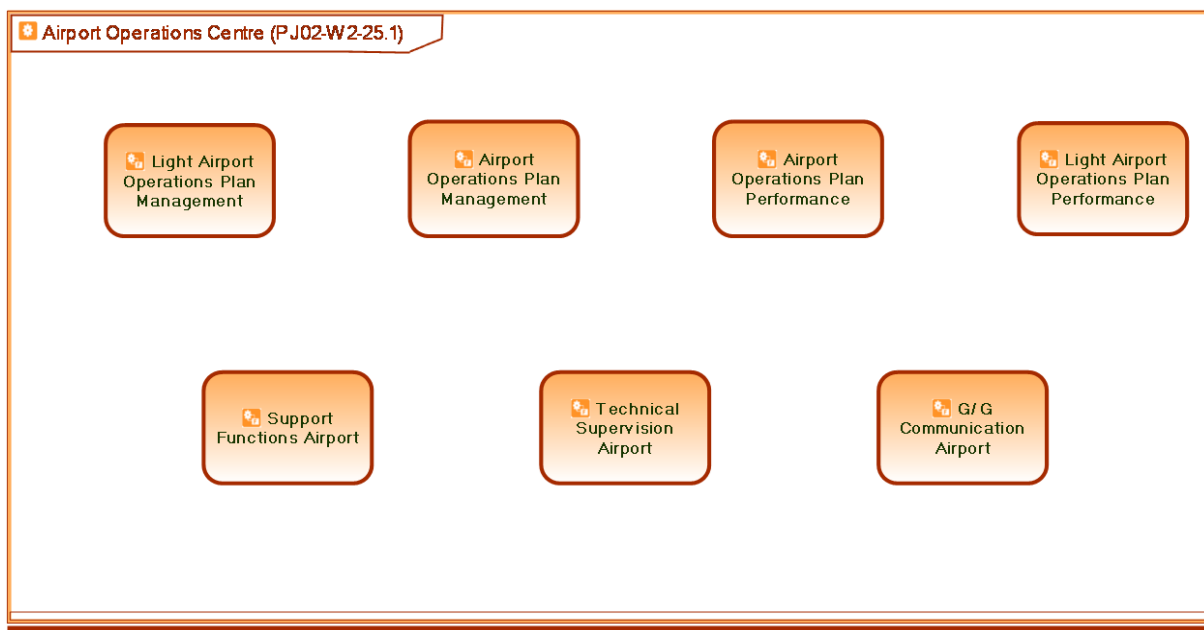## C.5 Airport Operations Centre TS

Figure 23 : Airport Operations Centre TS Composition View
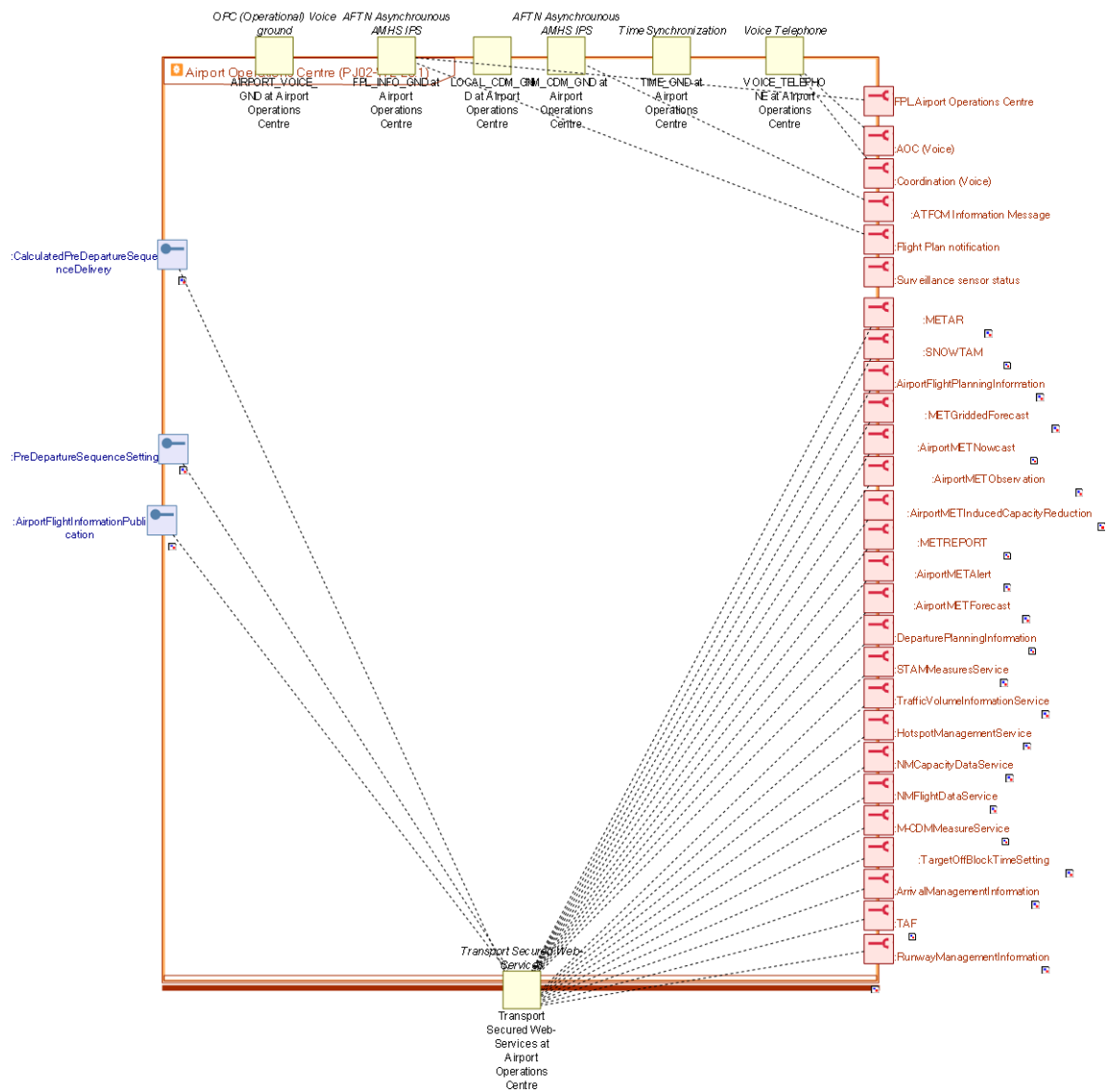
Figure 24 : Airport Operations Centre TS Interfaces View

C.6 Civil AU Flight Operations Centre TS

Figure 25 : Civil AU Flight Operations Centre TS Composition View
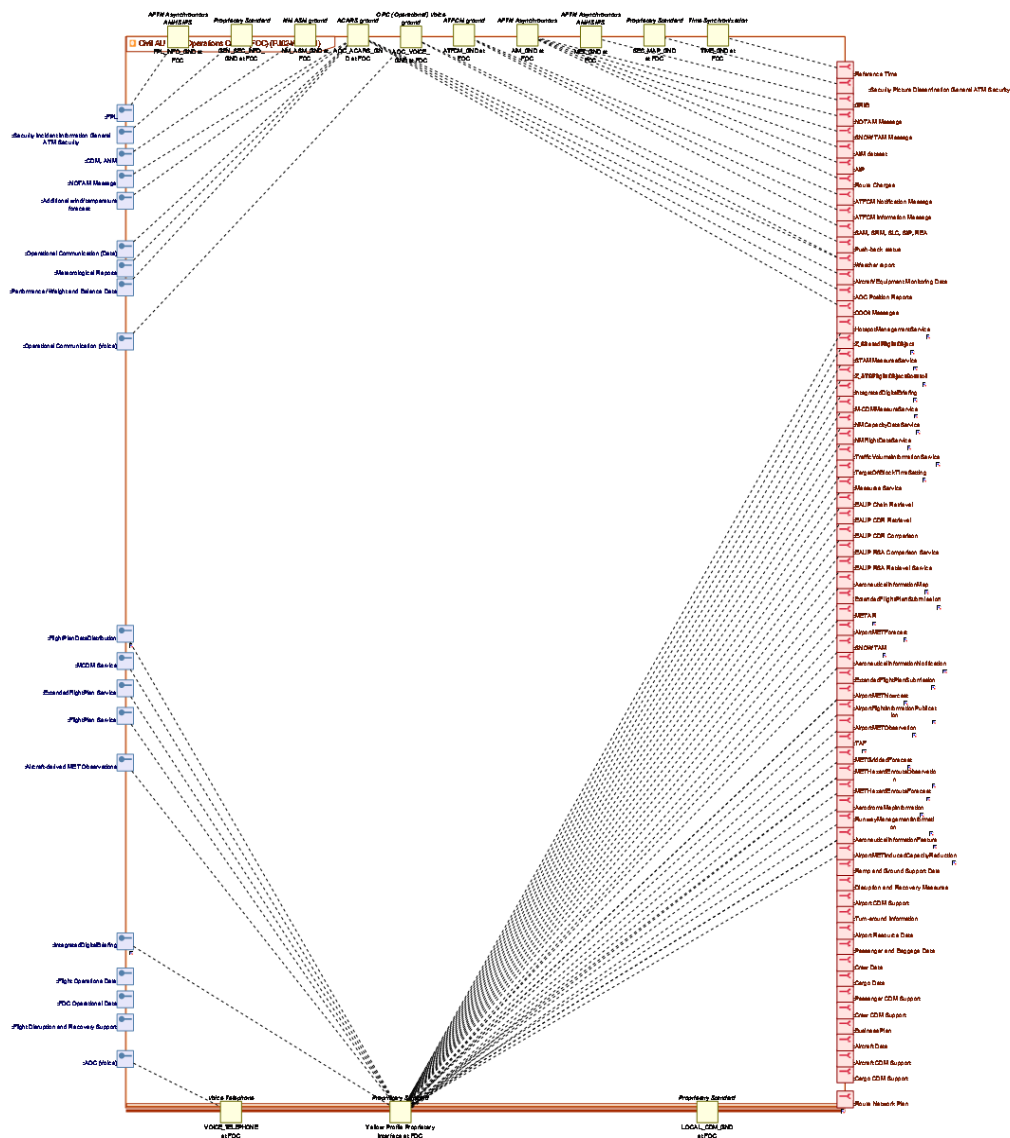
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Figure 26 : Civil AU Flight Operations Centre TS Interfaces View

C.7 Runway Condition Awareness and Monitoring System
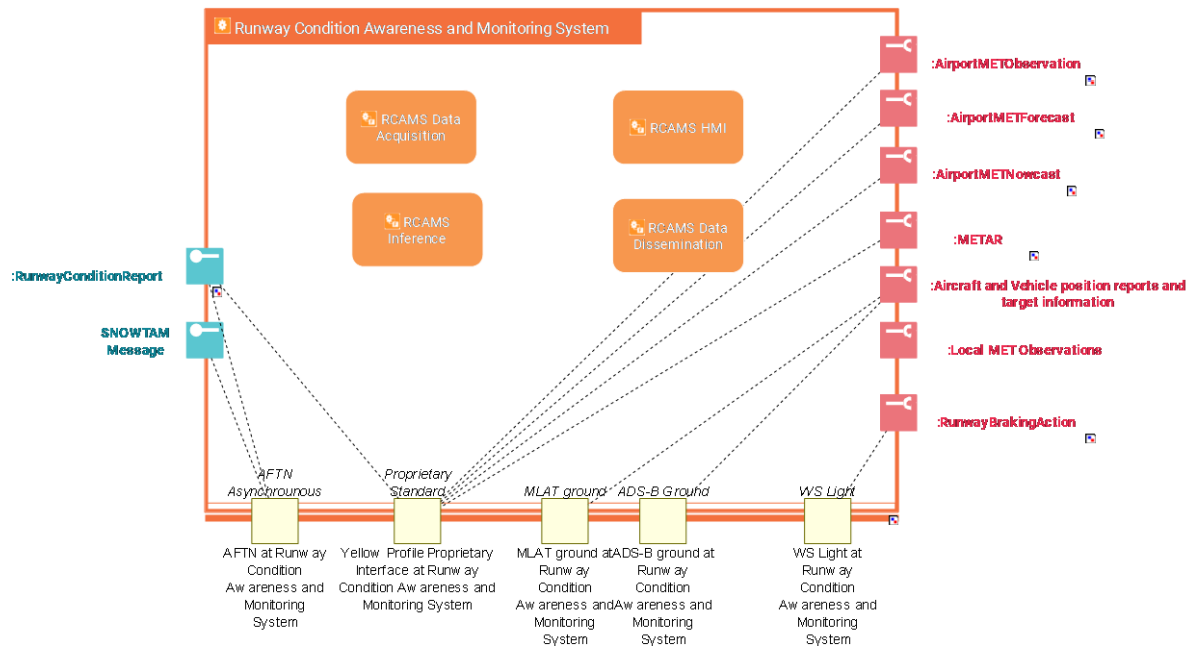

Figure 27 : RCAMS Interfaces View

Appendix D   Cancelled Enabler

Following Validation exercise in Gdansk, it appeared that OI AO-0107 (Improved Airport Safety with Better Prevention of Runway Excursions for Controllers) is rejected by Airport Operators and shall be removed from the Solution.

Associated data are stored in this Appendix D.

OI Step		OI description	Open CR
AO-0107		Improved Airport Safety with Better Prevention of Runway Excursions for Controllers	CR 06702 Sol update CR 06321 OI update
	EN code	EN description	Open CR
	AERODRO ME-ATC-31	Aerodrome ATC system for rapid runway condition dissemination to tower controllers	CR 04621 EN update
	APP ATC 197	Approach ATC system for rapid runway condition dissemination to tower controllers	CR 06322 EN creation

Capability Configurations required for the SESAR Solution :

Runway Condition Information Use			Airport		
CC	Op Env	Capability		Node	Stakeholder
APP ACC (PJ02-W2-25)	Terminal Airspace;	Surface Condition Awareness;		En-Route/Approach ATS;	Civil ATS Approach Service Provider; Military ATS Approach Service Provider;

Implemented by the civil and military ATS ANSP in an Approach ACC. In the context of Solution PJ.02-W2-25.1, the forwarding and monitoring of runway condition for landing performance assessment Civil Aircraft and Military Aircraft is the most essential in delivering the designated Capacities to Airpace Users.

The only change considered to this CC is a possibility of a rapid RCR delivery to APP ATCO CWP.

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Deleted requirements :

[REQ]

Identifier	REQ-02.25.1-TS-TWRC.102
Title	Tower Runway Controller to inform Airport Duty Officer of RCAMS failure
Requirement	Immediately upon reception of local dissemination failure alert Tower Runway Controller shall inform Airport Duty Officer of local dissemination failure via R/T.
Status	<validated>
Rationale	Shared situational awareness of human actors
Category	<Human Performance>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0058
<ALLOCATED_TO>	<Functional Block>	
<ALLOCATED_TO>	<Role>	Tower Runway Controller
<ALLOCATED_TO>	<Function>	Inform Airport Duty Officer of RCR reception loss
<ALLOCATED_TO>	<Enabler>	AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.119
Title	RCAMS Local Dissemination connectivity status for Tower Runway Controller
Requirement	RCAMS ATCO HMI shall be able to detect status of connectivity to RCAMS Local Dissemination.
Status	<validated>
Rationale	Keep users up to date about the status of local dissemination initiation.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0054
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Broadcast message: local dissemination on-line
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-60 AIRPORT-62 AIRPORT-63 AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Enabling of RCAMS local dissemination function

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[REQ]

Identifier	REQ-02.25.1-TS-RCLD.169
Title	RCAMS Local Dissemination to send Current Runway Condition to Tower
Requirement	RCAMS Local Dissemination shall send a message containing Current Runway Condition to RCAMS Tower HMI immediately upon receiving authorisation from RCAMS Duty Officer HMI
Status	<validated>
Rationale	Tower ATCO runway condition awareness must be maintained.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0019 REQ-02.25.1-SPRINTEROP-ATSS.0021
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-59 AIRPORT-60 AIRPORT-62 AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS

<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.174
Title	RCAMS Local Dissemination to send simplified Predicted Runway Condition to Tower
Requirement	RCAMS Local Dissemination shall send a message containing predicted runway condition tendency to RCAMS Tower HMI upon receiving prediction from RCAMS Inference.
Status	<validated>
Rationale	Tower ATCO runway condition awareness must be maintained.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0020
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-59 AIRPORT-60 AIRPORT-62 AERODROME-ATC-31

<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RATH.188
Title	Tower Dissemination security
Requirement	RCAMS shall be able to verify integrity of a transmitted Runway Condition message (predicted or current).
Status	<validated>
Rationale	Basic security on communication with Tower.
Category	<Security>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	security assesment not completed - no operational security requirements
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display RCR
<ALLOCATED_TO>	<Enabler>	AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.191
Title	Tower Dissemination resend
Requirement	RCAMS Local Dissemination shall resend Runway Condition message when system recovers from transmission/network error.
Status	<validated>
Rationale	In case of transmission/network error the system should retry sending information to Tower.
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0021
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-59 AIRPORT-60 AIRPORT-62 AIRPORT-63 AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCND.201
Title	RCR dissemination to other than Tower RCAMS ATCO HMIs
Requirement	RCAMS Non-local Dissemination shall allow dissemination of Runway Condition (current and tendency) to RCAMS ATCO HMIs outside Tower.
Status	<validated>
Rationale	This is to allow Approach Controllers to access the data. Approach ACC is often not local to the airport.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0019 REQ-02.25.1-SPRINTEROP-ATSS.0042
<ALLOCATED_TO>	<Functional Block>	RCAMS Non-local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Non-local RCR dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-63 AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RATH.105
Title	RCAMS ATCO HMI to alert user of RCR reception interruption
Requirement	RCAMS ATCO HMI shall display an alert with associated aural signal immediately upon determination of local dissemination failure.
Status	<in progress>
Rationale	Tower ATCO runway condition awareness must be maintained.
Category	<Safety>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-AIOP.0051
		REQ-02.25.1-SPRINTEROP-AIOP.0055
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	RCR reception loss alert
<ALLOCATED_TO>	<Enabler>	AIRPORT-57
		AIRPORT-58
		AIRPORT-60
		AIRPORT-62
		AIRPORT-63
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Failure of RCAMS local dissemination function\

[REQ]

Identifier	REQ-02.25.1-TS-RATH.189
Title	Tower Dissemination confirmation

Requirement	RCAMS ATCO HMI shall send a message confirming proper reception of Runway Condition message (predicted or current) from RCAMS Local Dissemination immediately upon reception and positive verification of a Runway Condition message (predicted or current).
Status	<in progress>
Rationale	RCAMS Local Dissemination state of dissemination awareness.
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	
<ALLOCATED_TO>	<Functional Block>	RCAMS ATCO HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Display RCR
<ALLOCATED_TO>	<Enabler>	AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCLD.193
Title	Tower Dissemination failure due to resend limit.
Requirement	RCAMS Local Dissemination shall initiate RCAMS Local Dissemination failure procedure if no confirmation is recieved from RCAMS Tower HMI after reaching maximum resend trial limit.
Status	<in progress>

Rationale	If there seems to be no communication with the Tower a failure must be declared.
Category	<Reliability>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-02.25.1-SPRINTEROP-ATSS.0021
<ALLOCATED_TO>	<Functional Block>	RCAMS Local Dissemination
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-59 AIRPORT-60 AIRPORT-62 AIRPORT-63 AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

[REQ]

Identifier	REQ-02.25.1-TS-RCAH.192
Title	Tower Dissemination resend limit
Requirement	RCAMS Admin HMI shall allow RCAMS Admin to set the maximum number of resend trials made by RCAMS Local Dissemination towards RCAMS ATCO HMI.

Status	<in progress>
Rationale	Configutration of failure conditions should also allow for flexibility defined by users.
Category	<Functional>

[REQ Trace]

Relationship	LinkedElement Type	Identifier
<ALLOCATED_TO>	<SESAR Solution>	PJ.02.25.1
<SATISFIES>	<ATMS Requirement>	REQ-03b.06-SPRINTEROP-ATSS.0006
<ALLOCATED_TO>	<Functional Block>	RCAMS Admin HMI
<ALLOCATED_TO>	<Role>	
<ALLOCATED_TO>	<Function>	Local RCR Dissemination
<ALLOCATED_TO>	<Enabler>	AIRPORT-57 AIRPORT-58 AIRPORT-59 AIRPORT-60 AIRPORT-62 AIRPORT-63 AERODROME-ATC-31
<ALLOCATED_TO>	<System>	RCAMS TS
<ALLOCATED_TO>	<Function View>	[NSV-4] Runway Condition Dissemination

-END OF DOCUMENT-

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