Final Project Report

Document information	
Project Title	Airport Safety Support Tools for Pilots, Vehicle Drivers and Controllers
Project Number	06.07.01
Project Manager	DSNA
Deliverable Name	Final Project Report
Deliverable ID	D02
Edition	00.01.01
Template Version	03.00.04
Task contributors	
DSNA	

Abstract

This SESAR project 06.07.01 developed and validated safety support tools and safety nets for improving the overall safety in the airport environment:

- The Runway Status Lights (RWSL) provides a set of indications through airfield lights directly towards pilots and vehicle drivers. These tools form the SESAR solution #01. The validation involved flight trials to achieve the V3 maturity level.

- Conformance monitoring alerts and detection of conflicting ATC clearances are Airport Safety Nets for controllers and form the SESAR solution #02. The validation activities were based on real-time simulations and on one shadow mode / live trial to achieve the V3 maturity level.

- The on-board airport vehicle alerts developed for vehicle drivers form the SESAR solution #04. The validation activities started with real-time simulations and ended with live trials to achieve the V3 maturity level.

The project also initiated the development and validation of aircraft cockpit indications and alerts for pilots. This activity was subsequently transferred to the project 09.14, achieving the V2 maturity level.

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Rational for rejection
None.

Document History

Edition	Date	Status	Author	Justification
00.01.00	15/09/2016	Final	[redacted]	Final
00.01.01	14/11/2016	Final	[redacted]	Final, following SJU comments

Intellectual Property Rights (foreground)

This deliverable consists of SJU foreground.

Acronyms

Acronym	Definition
ADS-B	Automatic Dependent Surveillance-Broadcast
AF	ATM Functionality
A-SMGCS	Advanced Surface Movement Guidance and Control Systems
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
CATC	Conflicting ATC Clearances
CMAC	Conformance Monitoring Alerts for Controllers
CMAP	Conformance Monitoring Alerts for Pilots
CWP	Controller Working Position
ECAC	European Civil Aviation Conference
EFS	Electronic Flight Strips
EUROCAE	European Organisation for Civil Aviation Equipment
HMI	Human Machine Interface
ICAO	International Civil Aviation Organization
INTEROP	Interoperability
OI	Operational Improvement
OSED	Operational Service and Environment Definition
PCP	Pilot Common Project
REL	Runway Entrance Lights
RIL	Runway Intersection Lights
RMCA	Runway Monitoring and Conflict Alerting
R/T	Radio/Telephony
RWSL	Runway Status Lights
SJU	SESAR Joint Undertaking

SPR	Safety and Performance Requirements
SURF-IA	SURFace Indications and Alerts
THL	Take-off Hold Lights
VALP	Validation Plan
VALR	Validation Report
WG	Working Group

1 Project Overview

The project 06.07.01 proposed the development of new airport safety nets and safety support tools for pilots, vehicle drivers and controllers, taking account of existing airport safety support tools (e.g. A-SMGCS Runway Monitoring and Conflict Alerting). These new airport safety support tools aim at avoiding hazardous situations particularly collisions by predicting, detecting and providing alerts for safety critical issues (e.g. risk of collision, route deviations, etc.) on the airport surface. More generally, within the scope the Project management task, the Project Manager coordinated with all appropriated SESAR projects and the Programme Manager, all SESAR activities related to the definition and the validation of the airport safety support tools

1.1 Project progress and contribution to the Master Plan

In reference to the ATM Master Plan, the project 06.07.01 contributed to the development of "Airport Safety Nets".

More precisely, the project 06.07.01 addressed the following airport safety nets and safety support tools together with the associated procedures and working methods. All these tools are independent from each other. However, the operational interoperability of the alerts generated by the different tools was analysed as part of the project in a dedicated deliverable ([6]). Some potential issues were described for consideration in the validation activities. They will be addressed in SESAR 2020.

The OI steps referenced here-under are based on Integrated Roadmap Dataset 16 ([61]).

a) For controllers:

- Detection of Conflicting ATC Clearances (CATC)
- Conformance Monitoring Alerts for Controllers (CMAC)

These tools detect ATC clearances that are conflicting with each other and non-conformances to ATC instructions and/or procedures. They form the SESAR Solution #02 “Airport Safety Nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances”. The deployment of the Solution #02 is requested by the Pilot Common Project (PCP) [62] supporting the implementation of the European ATM Master Plan under the ATM Functionality AF#2 "Airport Integration and Throughput".

CATC and CMAC functionalities complement the A-SMGCS alerts currently in operation at several European airports, i.e. the Runway Monitoring and Conflict Alerting (RMCA) system. They provide an early detection of situations that, if not corrected, would end up in hazardous situations that would be detected in turn by the A-SMGCS RMCA system. Moreover, the CMAC alerts provide additional alerts to detect abnormal situation that could occur everywhere on the manoeuvring area whereas CATC, are focusing only on the protection of Runway operations.

While the existing A-SMGCS RMCA functionality is only based on the surveillance data provided by the Aerodrome Core Surveillance and on the knowledge of some operational statuses like the visibilities conditions, these new tools are additionally based on the knowledge of data such as the clearances given to aircraft or vehicles by the Tower Controller, the assigned runway and holding point, and operational procedures.

Working procedures for the Tower Controllers are thus adapted to ensure that all clearances given to aircraft or vehicles are input in the ATM system by the Tower Controller. Tower Controller should therefore be provided with a Human Machine Interface (HMI) to inform the system of the clearances given to aircraft or vehicles, e.g. via Electronic Flight Strips (EFS) or radar track label means.

Moreover, the taxi routes are a necessary input for some solution #2 controller alerts (e.g. "route deviation alert"). Therefore, SESAR Solution #22 (Automated Assistance to Controller for Surface Movement Planning and Routing) is a pre-requisite for solution #02.

Here is a description of the Validation Roadmap for the Safety Nets and Support Tools for Controllers:

The CMAC and CATC functions were first evaluated separately through real-time simulations with tower controllers in the loop:

For CATC:
- V2 trials using Paris-CDG airport configuration.
- V3 trials using Hamburg airport configuration. These first V3 trials on CATC identified the interest of providing CATC indications to controllers, in addition to the CATC alerts. This concept of CATC indications was thus added in the CATC operational requirements.

For CMAC:
- V2 trials using Paris-CDG airport configuration.

CMAC and CATC functionalities were then evaluated together through real-time simulations with tower controllers in the loop:
- First V3 trials integrating both CMAC and CATC using Milan-Malpensa and Madrid-Barajas airport configurations (respectively). The results of the two validations were used to update the operational requirements, particularly the ones dealing with the display of alerts.
- Several trials, each with duration of one to two weeks, were then organised by DFS, DSNA, EUROCONTROL, ENAIRE and ENAV in order to reach the V3 maturity level, consisting of:
Four real-time simulations with controllers in the loop on different airport configurations: Barcelona-El Prat, Hamburg, Paris-CDG, Milan-Malpensa.
One shadow mode/live trial with live surveillance data at Riga airport (some aircraft were emulated by vehicles).

The project documentation was developed iteratively: updated after each main validation stage to produce the final, consolidated V3 documentation in support of the targeted SESAR Solution.

The project has addressed the following OI step from Dataset16:

Code	Name	Project contribution	Maturity at project start	Maturity at project end
AO-0104-A	Airport Safety Nets for Controllers in Step 1	As depicted in the above validation roadmap, the validation activities on this OI initially addressed each tool through real-time simulations. The project subsequently contributed to the validation activities performed in the scope of P06.03.01 in the form of integrated validations through real time simulations and shadow mode trials. Consolidated V3 documentation was produced in support of this validation and submitted in the Data Pack for SESAR Solution #02 and reported in Release 5.	V2	V3

b) For both pilots and vehicle drivers:

- Runway Status Lights (RWSL)

Runway Status Lights (RWSL) system is a fully automatic system based on A-SMGCS surveillance that can be used at airports to increase safety by preventing runway incursions. The information on runway usage is directly made available to the vehicle drivers and flight crews through new airfield lights, which can be composed of:

  - Runway Entrance Lights (REL): sets of red lights illuminated on runway entrances when it is not safe to enter or cross the runway;
  - Take-off Hold Lights (THL): sets of red lights illuminated along the axis of a runway in front of a departing aircraft when it is unsafe to take-off from that runway due to a mobile (vehicle or aircraft) already occupying the runway ahead;
  - Runway Intersection Lights (RIL): sets of red lights illuminated along the axis of a runway near the intersection with another runway when it is not safe to go through the intersection. It should be noted that RIL is part of the concept. Nevertheless, the Project has not provided requirements for RIL as Paris-CDG airport was the only validation environment used and does not have Intersecting Runways.

New operating methods have been defined for vehicle drivers and flight crews. The system is meant to be compatible with airport operations and independent of ATC clearances delivery. However, tower runway controllers should have access to the status of the REL/THL/RIL on their HMI, and some new operating methods have also been introduced for them, e.g. in case of flight crew request on the radio frequency.

Here is a description of the Validation Roadmap for the Runway Status Lights:

The validation process to demonstrate a V3 maturity level consisted in the performance of a series of trials which culminated in the conduct of live trials. The airport environment for this series of trials was Paris-Charles-de-Gaulle (CDG) airport.

This series of trials at Paris-CDG consisted in the following successive trials for the validation of both THLs and RELs using the runway 09R/27L:
a. Test platform.
b. Shadow mode without the actual switching on and off of the new airfield lights.
c. Live trials with State aircraft, simulated aircraft and vehicles.

The project documentation was updated after the validation exercises to produce the final, consolidated V3 documentation in support of the targeted SESAR Solution.

The project has addressed the following OI step from Dataset16:

Code	Name	Project contribution	Maturity at project start	Maturity at project end

AO-0209	Enhanced Runway Usage Awareness	The project validation activities on this OI addressed the REL and THL through real-time simulation, shadow mode trials and live flight trials. Note: the RIL could not be validated as the airport environment did not allow for the validation of RIL. Consolidated V3 documentation was produced in support of this validation and submitted in the Data Pack for SESAR Solution #01 and reported in Release 5.	V2	V3

c) For vehicle drivers: On-board moving map and alerts for airside vehicle drivers:

- On-board moving map
- Traffic alerts
- Area infringement alerts

This safety support tool is designed to provide vehicle drivers with:

- A continuous update on their position on the airfield
- A continuous update on position and identification of surrounding mobiles
- An alert when it enters a restricted or closed area or when it is in a conflict situation with an aircraft on the manoeuvring area. It provides detection and alerts in situations that if not corrected could end up in hazardous situations.

The safety support tool consists of an on-board vehicle display system which comprises:

- An airport moving map which indicates the position of the vehicle on the airfield
- A ground traffic display which displays other traffic operating on the manoeuvring area
- An alerting system to provide an aural and visual alert to the vehicle driver

Some alerts in the vehicles can be generated by an on-board system and/or some alerts by a centralised ground server with an uplink to the vehicle.

Here is a description of the Validation Roadmap for the Safety Nets and Support Tools for Vehicle Drivers:

The V2 validation process consisted in the performance of two real-time simulations involving operational drivers and the V3 validation process consisted of live trials in two different airport environments.
- The two real-time simulations were first performed, leading to an update of the operational, safety, performance and interoperability requirements. The simulated environment was using the Stockholm Arlanda airport layout. The two types of alerts were assessed: Traffic alerts on the manoeuvring area involving aircraft, and Area alerts in the case of infringement of predefined areas. The objective of these validations was to evaluate these alerts in a realistic environment using operational vehicle drivers.

- The two live trials were then performed in the same timeframe, leading to the final update of the operational, safety, performance and interoperability requirements. One of the live trials was

performed at Dublin airport. These trials validated the two types of alerts using a centralised implementation, i.e. the alerts were generated in a ground server and uplinked to the vehicles for display to the drivers. The other live trials were performed at Paris-CDG airport. These trials validated the two types of alerts but using a different implementation as the alerts were directly generated on-board the vehicles.

The project has addressed the following OI steps from Dataset16:

Code	Name	Project contribution	Maturity at project start	Maturity at project end
AO-0105	Airport Safety Net for Vehicle Drivers	At the project start, AO-0105 was in the scope of the project but not AO-0204, which was added later on after the V2 validation activities. Project V2 validation addressed AO-0105 through real-time simulations. Then V3 validations addressed both AO-0105 and AO-0204 through live trials performed in the scope of two projects: 06.07.01 and 06.03.01. Consolidated V3 documentation was produced in support of this validation and submitted in the Data Pack for SESAR Solution #04 and reported in Release 5.	V2	V3
AO-0204	Airport Vehicle Driver's Traffic Situational Awareness		V2	V3

d) For pilots: Aircraft cockpit alerts

- Traffic alerts (SURF-IA: SURFace Indications and Alerts)
- Conformance Monitoring Alerts for Pilots (CMAP)

To improve the safety of runway operations, the SURF-IA application aims at triggering alerts in the cockpit to inform directly the flight crew in case of risk of collision against any mobile (i.e. aircraft or ground vehicle) equipped with ADS-B OUT transmitter.

SURF-IA is intended to be used by commercial aircraft (i.e. mainline, regional aircraft and business jets) at controlled and uncontrolled airports, from relatively simple aerodrome layouts and low-density operations, to highly complex runway and taxiway layouts supporting super-high traffic densities.

The CMAP application consists of the detection of non-conformance to ATC instructions/procedures, and of non-conformance with airport specificities. The objective of this service is to alert Flight Crew when their ownship deviates from ATC instructions or procedures, potentially placing the aircraft at risk.

Here is a description of the Validation Roadmap for the Safety Nets and Support Tools for Pilots:

- Part of the validation activities were initially performed in the scope of the project 06.07.01 with the support of project 09.14.
- The project documentation was initially developed in the scope of the project 06.07.01.
- All activities related to the aircraft cockpit alerts for pilots were subsequently transferred to project 09.14.

  - Several trials were performed from 2010 to 2015. These trials were real-time simulation using mock-ups, research simulators for each aircraft type, or real mainline avionics system prototypes.

- Results of these trials fed the operational deliverables (OSED, SPR and INTEROP) as well as the FRD (Functional Requirements Document, that aims at defining aircraft requirements) and ADA (Architecture Definition Assumptions, that aims at defining aircraft architecture solutions) documents.

The project has addressed the following OI steps from Dataset16:

Code	Name	Project contribution	Maturity at project start	Maturity at project end
AUO-0605	Traffic Alerts for Pilots during Runway Operations	This OI corresponds to SURF-IA. Initial V2 validation of this OI through real-time validation and development of the project documentation before the transfer of this activity to project 09.14.	V1	V2 (see P09.14)
AUO-0614	Conformance Monitoring Safety Nets for Pilots	This OI corresponds to CMAP. Initial V1 validation of this OI through real-time validation and development of the project documentation before the transfer of this activity to project 09.14.	V1	V2 (see P09.14)

1.2 Project achievements

The project 06.07.01 contributed to deliver the following SESAR solutions:

- SESAR Solution #01 “Runway Status Lights” related to the OI AO-0209.
- SESAR Solution #02 “Airport Safety Nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances” related to the OI AO-0104-A. This SESAR solution will contribute to the PCP under AF#2 "Airport Integration and Throughput".
- SESAR solution #04 “Enhanced Traffic Situational Awareness and Airport Safety Nets for the vehicle drivers” related to the OIs AO-0204 and AO-0105.

The validation activities confirmed the benefits of these SESAR Solutions in terms of safety. In addition, some of these solutions confirmed benefits in terms of situational awareness.

In the context of SESAR 2020, the work will focus on:

- The use of actual airport surveillance data for validations
- The need to consider other types of airspace users
- The continued support to standardisation in order to have the necessary standards for PCP implementation
- The extension of the functional scope of the solution (e.g. new alerts such CATC for ground controller).

The project 06.07.01 also contributed to mature the cockpit solutions for Flight Crew i.e.

- Cockpit solutions for "Airport Safety Nets for the Flight Crew: traffic alerts during runway operations" related to OI AUO-0605.
- Cockpit solutions for "Airport Safety Nets for the Flight Crew: conformance monitoring safety nets" related to OI AUO-0614.

These cockpit solutions will be further improved and validated in SESAR 2020, in order to achieve the V3 maturity level.

1.3 Project Deliverables

The following table presents the relevant deliverables that have been produced by the project.

Reference	Title	Description
D32	Final OSED for CATC and CMAC	The document details the Operational Improvement (OI) AO-0104A Airport Safety Nets for Controllers in Step 1. The OI falls under the Operational Focus Area (OFA) 01.02.01 Airport Safety Nets and focuses on SESAR Solution 2 which details the new functions: - Conflicting ATC Clearances (CATC) - Conformance Monitoring Alerts for Controllers (CMAC)
D29	Updated SPR for CATC and CMAC	Updated before the Release 5 activities
D10	Final OSED for RWSL	This document contains the operational requirements of the SESAR Solution #01 Runway Status Lights (RWSL).
D11	Final SPR for RWSL	This document contains the Safety and Performance Requirements (SPR) relating to the SESAR Solution #1, Runway Status Lights (RWSL) application. It is based on the results of the V3 trials performed at Paris-CDG and on the RWSL generic safety assessment produced by EUROCONTROL. It reflects the D10 final Operational Services and Environment Description (OSED).
D09	V3 Validation Report for RWSL	This document contains the results of the V3 trials performed at Paris-CDG airport, implementing the Take-off Hold Lights (THL) and Runway Entrance Lights (REL).
D77	Final OSED for Alerts for Vehicle Drivers	This document contains the operational requirements of the SESAR Solution #04 Enhanced Traffic Situational Awareness and Airport Safety Nets for the vehicle drivers.

D78	Final SPR for Alerts for Vehicle Drivers	This document contains the safety and performance requirements of the SESAR Solution #04 Enhanced Traffic Situational Awareness and Airport Safety Nets for the vehicle drivers.
D79	Final INTEROP for Alerts for Vehicle Drivers	This document contains the interoperability requirements of the SESAR Solution #04 Enhanced Traffic Situational Awareness and Airport Safety Nets for the vehicle drivers.
D76	V3 Validation Report for Alerts for Vehicle Drivers (EXE-06.07.01-VP-769)	This document contains the results of the live trials performed at Dublin airport, implementing the uplink of alerts from a ground centralised server.
D05	Operational concept for the integration of the safety support tools	This document provides a description of the safety support tools addressed by P06.07.01 and P09.14, and it highlights the potential interactions and complementarities between them.

Notes:

1) The project 06.07.01 contributed to P06.03.01 validation plan and validation report for the 5 integrated validation exercises dealing with ATCO tools, including the safety support tools for ATCOs.

2) The results of the validation exercise in Paris CDG (by DSNA, Groupe ADP and Eurocontrol) and in Dublin (by NORACON) documented in some P06.03.01 deliverables were used to update the P06.07.01 final documentation (OSED, SPR and INTEROP). To facilitate this update, the project 06.07.01 led the results consolidation of both validation exercices.

1.4 Contribution to Standardisation

SESAR supports the EUROCAE Working Group 41 to build standards for CMAC and CATC services, which are part of PCP AF#2. The solution #02 pack will also be used to further develop the EUROCONTROL A-SMGCS Specification document.

In coordination with SJU, the OFA01.02.01 Coordinator and P06.07.01 Project Manager was acting as SESAR representative in WG-41 (A-SMGCS standards development). For this support to WG-41, efforts were those of "management task" as there was no dedicated task in project 06.07.01.

In June 2015, SESAR presented to WG41 the CMAC, CATC and Routing & Planning functions. In September 2015, to initiate the development of WG41 standards, all relevant WP6 "Airport Operation" and WP12 "Airport Systems" documents were presented and made available to WG41.

1.5 Project Conclusion and Recommendations

CONCLUSIONS:

The project delivered three SESAR solutions that reached the V3 maturity level:

- One of these SESAR solutions, solution #02, expected to be in operation by 2021 on 24 ECAC airports as described in the Pilot Common Project (PCP) [62].

- Solution #01 Runway Status Lights (RWSL): the main potential benefit reported is less severe and less frequent runway incursions thanks to the improvement of runway usage awareness through indication of runway usage.

- Solution #04: On the entire manoeuvring area, the safety is improved as the vehicle driver is warned in case of area infringement or conflicting situation involving an aircraft. Moreover, the situational awareness is improved, thanks to the on-board moving map displaying the ownship vehicle position and surrounding traffic.

RECOMMENDATIONS:

The following recommendations need to be taken into consideration when using the project results towards deployment:

Solution #01 Runway Status Lights (RWSL):

- Ensure airport core surveillance system performances.
- Adapt the configuration of the RWSL illumination logic to local procedures.
- Develop appropriate vehicle drivers and pilots training.
- Ensure that ATCOs are aware that they should not use RWSL lights statuses available on Runway Controller Position for clearance delivery.
- Develop operational procedures for use when RWSL is in conflict with clearances.
- Perform additional validation of RWSL in non-nominal operational conditions (e.g. low visibility operations).
- Confirm that RWSL does not increase the radio communications between mobiles and controller.
- Validate the operational requirements related to crossing runways (RIL) to fully cover the OI Step AO-0209.

Solution #02: Airport Safety Nets for controllers: Conformance monitoring alerts and Detection of conflicting ATC clearances

- Local Operational and Technical personnel should work together when implementing CATC and CMAC alerts in order to define parameters such as triggering times, HMI design and on which Controller Working Positions (CWPs) alerts are displayed.

- The effectiveness of the new safety support tools for controllers relies on the timely input of ATC clearances into the system by controllers. Therefore the working methods of controllers at some ATC units may have to be adapted and the controllers trained on these new working methods. If the ATC clearances or instructions are not input into the system when they are given by radio to the mobiles then the number of nuisance alerts could increase.

- The usability and benefits of the new safety support tools depend directly on the sustained performance and coverage of the Aerodrome Core Surveillance Function. The lack of quality surveillance data should be studied because it could affect the rate of false alerts which can be considered as a risk for deployment.

- The phased deployment of CMAC and CATC functionalities is highly recommended.

Solution #04: Enhanced Traffic Situational Awareness and Airport Safety Nets for the vehicle drivers

The Validation Reports produced following the two Live Trials include recommendations in the following areas:

- Alerts;

- Ergonomic aspects;

- System performance;

- Enablers and system inputs;

- Procedures;

- Vehicle Drivers' training.

Additional activities on the supporting enablers have been identified:

- Supporting data link network for the uplink of alerts from a central server.

- Enhancement of airport surveillance to reduce the number of nuisance alerts.

2 References

[1] SESAR Programme Management Plan, Edition 03.00.01

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[40] P06.07.01, V2 Validation Report for "Traffic Alerts for pilots", D51, 00.01.00, 12 October 2012

[41] P06.07.01, Prototype supporting V2 trials on "Conflicting ATC Clearances", D61, 00.01.00, 16 January 2012

[42] P06.07.01, Prototype supporting V2 trials on "Alerts for Vehicle Drivers",D64, 00.01.00, 23 February 2012

[43] P06.07.01, V1 Validation Plan for "Conformance Monitoring for Pilots", D66, 00.01.01, 19 October 2012

[44] P06.07.01, V1 Validation Report (VALR) for Conformance Monitoring for Pilots, D67, 00.02.00, 23 August 2013

[45] P06.07.01, V3 Validation Plan for Alerts for Vehicle Drivers (EXE-06.07.01-VP-769), D75, 00.01.00, 22 June 2015

[46] P06.07.01, V3 Validation Report for Alerts for Vehicle Drivers (EXE-06.07.01-VP-769), D76, 00.01.02, 29 July 2016

[47] P06.07.01, Final OSED for Alerts for Vehicle Drivers, D77, 00.01.01, 7 June 2016

[48] P06.07.01, Final SPR for Alerts for Vehicle Drivers, D78, 00.01.02, 19 October 2016

[49] P06.07.01, Final INTEROP for Alerts for Vehicle Drivers, D79, 00.01.01, 13 October 2016

[50] P06.03.01, Release 5 Validation Plan, D148, 00.01.02, 26 January 2016

[51] P06.03.01, Release 5 Validation Report, D149, Edition 00.01.00, 2 September 2016

[52] P06.03.01, V3 Validation Plan for Alerts for Vehicle Drivers (EXE-06.03.01-VP-724), D150, 00.01.01, 21 May 2015

[53] P06.03.01, V3 Validation Report for Alerts for Vehicle Drivers (EXE-06.03.01-VP-724), D151, 00.01.01, 07 January 2016

[54] P09.14, Final OSED for Traffic Alerts for Pilots, D36, 00.02.00, 29 January 2016

[55] P09.14, Final SPR for Traffic Alerts for Pilots, D37, 00.01.00, 08 January 2016

[56] P09.14, Final INTEROP for Traffic Alerts for Pilots, D38, 00.01.00, 19 February 2016

[57] P09.14, Updated OSED for Conformance Monitoring for Pilots, D39, 00.01.01, 31 March 2016

[58] P09.14, Updated SPR for Conformance Monitoring for Pilots, D40, 00.01.01, 31 March 2016

[59] EUROCAE ED-87C MASPS for Advanced Surface Movement Guidance and Control Systems (A-SMGCS) – Levels 1 & 2 - Including Amendment N°1 - January 2009

[60] P06.02 D122 Airport Step 1 DOD 2014 update, V1.1, 31/03/2015

[61] Integrated Roadmap Dataset 16 of the Master Plan, aligned with the released Edition 2015 of the Master Plan, December, 2015

[62] Implementing Regulation (EU) No 716/2014

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