Final Project Report

Document information	
Project Title	Usability Requirements and Human Factors Aspects for the Controller Working Position
Project Number	05.09
Project Manager	ENAV
Deliverable Name	Final Project Report
Deliverable ID	D44
Edition	00.01.03
Template Version	03.00.03
Task contributors	
ENAV, ENAIRE, DSNA, NORACON, FREQUENTIS,DFS, NATS	

Abstract

The project 05.09 scope was to provide early direction and guidance relating to CWP/HMI operational and human factors issues for ATM concept development in Terminal and En-route airspace, in order to have human-centred design for controller interfaces.

By supporting other SESAR projects which developed TMA and En-route ATM concepts this project was transversal in nature. This allowed an overall picture of HMI aspects within EN-Route and TMA working areas to be developed and supported a coherent and consistent approach to HMI aspects, within single projects and at programme level.

Authoring & Approval

Prepared By - *Authors of the document.*		
Name & Company	Position & Title	Date
[redacted] ENAV	[redacted]	30/03/2016

Reviewed By - *Reviewers internal to the project.*		
Name & Company	Position & Title	Date
[redacted] DFS	[redacted]	12/01/2016
[redacted] DLR		12/01/2016
[redacted] DLR		12/01/2016
[redacted] DSNA		04/01/2016
[redacted] ENAIRE		04/01/2016
[redacted] ENAIRE		04/01/2016
[redacted] ENAV		04/01/2016
[redacted] ENAV		11/12/2015
[redacted] FREQUENTIS		04/01/2016
[redacted] FREQUENTIS		04/01/2016
[redacted] NATS		04/01/2016
[redacted] NORACON		12/01/2016
[redacted] NORACON		04/01/2016
[redacted] ETF		04/01/2016
[redacted] ATCEUC		04/01/2016
[redacted] ATCEUC		04/01/2016

Reviewed By - *Other SESAR projects, Airspace Users, staff association, military, Industrial Support, other organisations.*		
Name & Company	Position & Title	Date
[redacted] NATS	[redacted]	03/03/2016

Approved for submission to the SJU By - *Representatives of the company involved in the project.*		
Name & Company	Position & Title	Date
[redacted] NATS	[redacted]	03/03/2016
[redacted] DFS		19/01/2016
[redacted] DSNA		19/01/2016
[redacted] ENAIRE		19/01/2016
[redacted] ENAV		18/01/2016
[redacted] FREQUENTIS		19/01/2016
[redacted] NATS		19/01/2016
[redacted] NORACON		19/01/2016

Rejected By - *Representatives of the company involved in the project.*		
Name & Company	Position & Title	Date
<Name / Company>	<Position / Title>	<DD/MM/YYYY>

Rational for rejection
None.

Document History

Edition	Date	Status	Author	Justification
00.00.01	06/02/2015	Initial Draft	[redacted]	New Document
00.00.02	11/12/2015	Revised Draft		Updated Template
00.00.03	12/01/2016	Final		Ready for external review
00.01.00	15/01/2016	Final		Ready for Approval.
00.01.01	19/01/2016	Final		Used Template 03.00.03 and Approved
00.01.02	03/03/2016	Final		Assessment Updates implemented and WPL feedback
00.01.03	30/03/2016	Final		2nd round Assessment Updates implemented

Intellectual Property Rights (foreground)

This deliverable consists of SJU foreground.

Acronyms

Acronym	Definition
ACAS	Airborne Collision Avoidance System
ASAS	Airborne Separation Assistance System
ATM	Air Traffic Management
DOD	Detailed Operational Description
EN	Enabler
EXE	Exercise
HMI	Human Machine Interface
INTEROP	Interoperability Document
OFA	Operational Focus Areas
OI	Operational Improvements
OSED	Operational Service Environment Definition
PP	Primary Project
SESAR	Single European Sky ATM Research Programme
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency
SPR	Safety and Performance Requirements
TMA	Terminal Manoeuvring Area
TMF	Trajectory Management Framework
VALP	Validation Plan
VALR	Validation Report

1 Project Overview

Project 05.09 played a supportive and transversal role for the integration and harmonization of the HMI of the SESAR ATM System, addressing both En-route and Terminal Area concept of operation.

1.1 Project progress and contribution to the Master Plan

Project 05.09 work provided early direction and guidance relating to CWP/HMI operational and human factors issues specific to terminal airspace and en-route concept of operation, in order to have human-centred design for controller interface.

The SESAR Work Programme is structured around a set of Operational Focus Areas (OFA) to ensure dependencies between operational and technical aspects (e.g. Operational Improvements (OIs) and Enablers (ENs) are linked to perform coherent and integrated V&V activities and associated results.

The OFAs with interest for the HMI aspects were grouped in following three different Priority Strategic Business Needs:

- Traffic Synchronization
- Moving from Airspace to 4D Trajectory Management
- Conflict Management and Automation

The activities were organized to guarantee a good monitoring and an adequate support based on the different working levels (e.g. OFA or PP level) by using an approach based on different key phases:

- Contact
  - to establish the first contact and explain the different support activities
- Agree
  - to define “What?” and “How?” to support the OFA/PP
    - What: the type of support (e.g. review, HMI requirements, validation objectives)
    - How: agree the way forward to support the activities (e.g. direct involvement in team work, external reviewer, observer during exercise)
- Work
  - to work on the activity
- Monitoring
  - to monitor the activities and guarantee the expected results in term of Project 05.09 support

The Provided support was managed in parallel by three different tasks:

- 2015 OFA Coordination Activity
  - To manage the coordination at OFA level
- Support to OFA HMI Requirements Identification
  - To support deliverable activities
- Support to V3 Validations
  - To support exercise activities

Which followed the subsequent logical flow:

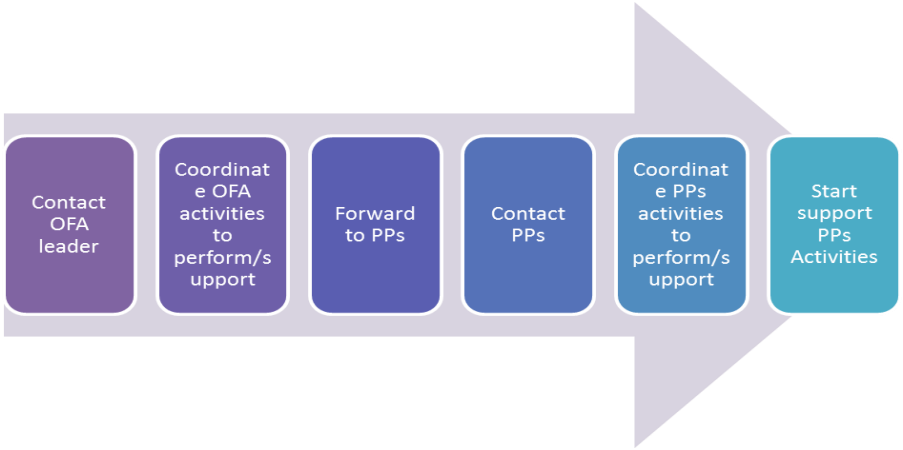

Figure 1 - Project 05.09 logical flow

Project 05.09 acted as ENB06.02.01 coordinator where both operation and technical project cooperated to ensure consistency and coherency of produced guidelines and recommendation. In particular the process foresaw Project 05.09 input analysis for P10.10.02. and shared teams worked together to ensure mutual feedback.

Through transversal support provide to other projects, we significantly contributed to the improvement of HMI & HF aspects focusing on the following Operational Improvements and SESAR Solution:

OI	OI Title	Solution
TS-0103	Controlled Time of Arrival (CTA) in medium density/complexity environment	#06 - Controlled Time of Arrival (CTA) in Medium density / medium complexity environment
TS-0105-A	ASAS Spacing - target direct to merge point (Speed/simple geometry)	#16 - ASAS Spacing applications Remain behind and Merge behind
CM-0103-A	Automated Support for Traffic Complexity Assessment	#19 - Automated support for Traffic Complexity Detection and Resolution
CM-0104-A	Automated Controller Support for Trajectory Management	#19 - Automated support for Traffic Complexity Detection and Resolution
TS-0305-A	Arrival Management Extended to En Route Airspace - single TMA	#05 - Extended Arrival Management (AMAN) horizon
TS-0303	Arrival Management into Multiple Airports	#08 - Arrival Management into Multiple Airports
AOM-0500	Direct Routing for flights both in cruise and vertically evolving for cross ACC borders and in high & very high complexity environments.	#32 - Free Route through the use of Direct Routing
AOM-0501	Free Routing for Flights both in cruise and vertically evolving within low to medium complexity environments	#33 - Free Route through Free Routing for Flights both in cruise and vertically evolving above a specified Flight Level
CM-0201-A	Automated Assistance to Controller for Seamless Coordination, Transfer and Dialogue through improved trajectory data sharing	#28 - Automated Assistance to Controller for Seamless Coordination, Transfer and Dialogue through improved trajectory data sharing
CM-0205	Advanced Conflict Detection and Resolution in En Route	#27 - MTCD and conformance monitoring tools
CM-0207-A	Advanced Automated Ground Based Flight Conformance Monitoring in En Route	#27 - MTCD and conformance monitoring tools
CM-0802	Display and use of ACAS resolution advisory downlink on the controller working position	#58 - Display and use of ACAS resolution advisory downlink on the controller working position
AO-0801	Collaborative Airport Planning Interface	#21 - Airport Operations Plan and AOP-NOP Seamless Integration

AO-0802	A-CDM process enhanced through integration of landside (passenger only) process outputs	#21 - Airport Operations Plan and AOP-NOP Seamless Integration
AO-0104-A	Airport Safety Nets for Controllers in Step 1	#02 - Airport Safety Nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances
AO-0205	Automated Assistance to Controller for Surface Movement Planning and Routing	#27 - MTCD and conformance monitoring tools
AUO-0308	Datalink Services used for Provision of Ground-related Clearances and Information for Step 1	#23 - D-TAXI service for CPDLC application
SDM-0204	Remotely Provided Air Traffic Service for Contingency Situations at Small to Medium Aerodromes (with a Single Main Runway)	#13 - Remotely Provided Air Traffic Service for Contingency Situations at Aerodromes

1.2 Project achievements

The purpose of Project 05.09 support was to provide HMI expertise to the OFAs/PPs to work with HMI aspects from the identification of operational requirements to prototypes development by:

- creation/review of documentation (HMI aspects);
- creation of HMI requirements/objectives;
- feedback to development and/or validation of HMI elements;
- exercise participation as HMI experts.

The following list provides the details of achieved support, specifying the type, depending on the different documents/activities addressed.

- DOD
  - Document Review
  - Specific HMI Requirements Production
- VALS
  - Document Review
  - Specific HMI Validation Objectives Production
- OSED / SPR / INTEROP
  - Document Review
  - Specific HMI Requirements Production
- EXE
  - Participate actively to the Exercises
  - VALP / VALR
  - Document Review
  - Specific HMI Validation Objectives Production

In its early stages the project conducted quick wins validation exercises addressing the HMI aspects in an integrated manner for en-route and TMA operation environment respectively. These validation activities followed the preparatory activities leading to the definition the relevant operational requirements and use cases.

Through transversal support provided to other projects, the project contributed to work on the HMI aspects by reviewing, creating and evaluating the HMI & HF aspects. This activities significantly contributed to the improvement of HMI & HF aspects focusing on the Operational Improvements and SESAR Solution impacted in the primary project activities.

In addition to support descript above, when agreed with the supported project, project 05.09 used HMI FORUM as a tool to support the activities linked to the validation exercises. The double functionality of the tool was to list the HMI elements produced in validation activities creating an HMI library and collect feedback about the create HMI requirements useful during the exercise preparation.

1.3 Project Deliverables

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

Reference	Title	Description
D114	HMI FORUM EXPORT	The scope of the HMI FORUM EXPORT is to put in an off-line format all the materials produced during the support activities using HMI FORUM Tool. The document describe the major functionalities of the tool and contains all the materials produced also available on-line on the HMI FORUM site
D109	Report of Performed Supporting Activities in 2015	This deliverable summarize the 2015 activities performed in cooperation with identified primary projects, how coordination has been set up and which kind of contribution that has been provided by Project 05.09 member/s. This version represents the final iteration of yearly issued Project 05.09 report of supporting activities.
D105	2015 Technical Note	This deliverable reports the Gap/coherency/consistency analysis on the HMI Operational Requirements Grouped by OFAs→PPs based on a dump of available material provided by IS. The results of this analysis were used to trigger primary projects to update their documentation in accordance with the provided recommendations. This version represents the final iteration of yearly issued Project 05.09 technical note
D112	Report of performed HMI FORUM Activities in 2014	This document summarise the activities performed in 2014 HMI Forum task. This task aims to support primary projects in the HMI design and to gather the HMI elements produced by the projects in their validation activities.
D104	2014 Technical Note	This deliverable reports the Gap/coherency/consistency analysis on the HMI Operational Requirements Grouped by OFAs→PPs based on a dump of available material provided by IS. The results of this analysis were used to trigger primary projects to update their documentation in accordance

		with the provided recommendations.
D107	Report of performed activities in 2013	The document summarise the reporting activities performed by SESAR P05.09, in the second half of 2013, in its two following tasks.
D100	2013 HMI operational Style guide iteration 2	The purpose of this document is to serve as a source of inspiration for the Primary Projects in their process of designing HMI objects by giving guidance and help them to determine where and how objects shall be presented.
D111	Report of performed HMI demonstrator Activities 2013	The document summarise the activities reported by SESAR P05.09 task partners who provide on-going HMI Demonstrator support to OFAs, and constituent PPs. This activity commenced with the approval of the P05.09 change request in April 2013.
D103	2013 Technical Note iteration 2	This deliverable reports the Gap/coherency/consistency analysis on the HMI Operational Requirements Grouped by OFAs→PPs based on a dump of available material provided by IS.
D21	Technical Supervisor initial requirements and use cases step 2	The purpose of this document is to define the HMI User Requirements (in terms of HMI operational and human performance requirements) to be implemented in the Supervision Solution of project 10.1.9. It also defines the high-level use cases for the proof of concept of the implemented Service Supervision approach. The HMI User Requirements for a generic Service Supervision prototype defined here are not related to a specific ATC domain, they are general requirements representing the common HMI needs for the service supervision in a wide spectrum of ATC domains in an ATM environment. Consequently, there are no target services to be supervised.
D96	Validation Report	This Validation Report covers the EXE-05.09-VP-143 which is focused on the En-Route and TMA operational environment in order to evaluate the usability requirements and human factors aspects related to the use of an Extended-AMAN as supporting tool and the application of P-RNAV procedures The new TMA P-RNAV has proved to be very efficient and has improved aspects such as efficiency, capacity, safety, HMI, and situational awareness. Regarding AMAN, the results show that it has been considered as a

		new tool, useful to establish the arrivals sequences; however, in some scenarios, such as configuration changes, holding and high density of traffic situations, is believed to be still in an early stage. HMI also could be improved in order to work with it
D99	VP356 Validation report	This Validation report covers two Validation Exercises: VP-355 and VP-356, both conducted by ENAV and focusing on the TMA operational environment. The activities consisted of Human in the loop RTS using eDEP platform in V2 phase and ENAV/SELEX Industrial Based Platform for the V3 phase. Both exercises allowed to collect positive feedbacks concerning the operational feasibility and the acceptability of the HMI objects integration related to the simulated operational improvements in a whole integrated controller working position. The usability of the innovative tools placed at controller's disposal was often appreciated, even if some suggestions in order to improve the HMI effectiveness were provided.
D94	VP143 Validation exercise plans step 1 - V2 and V3	This Validation Plan covers the EXE-05.09-VP-143 which will be performed by AENA and is focused on the En-Route and TMA operational environment. The main objective is to analyse the usability requirements and human factors aspects related to the use of an Extended AMAN as supporting tool and the application of P-RNAV procedures.
D89	VP148 Validation Report	This Validation Report covers two Validation Exercises: VP-406 and VP-148, both conducted by DSNA, which are focused on HMI integration in the En Route environment. The aim of the exercises was to evaluate the overall HMI usability of an enhanced HMI design for “baseline” functions. The benefit has been to establish a starting point, the HMI design implemented in the prototype is considered a basis towards a full-featured SESAR iCWP. In details this exercise could be considered as the start of a process which will allow building on the Coflight-based DSNA Thales En Route IBP a number of “V3” validation exercises. This process ensured that HMI integration of new SESAR concepts were evaluated with efficiency and pragmatism during the conducted exercises
D87	VP148 Validation exercise plans step 1 - V2 and V3	This Validation Plan covers two Validation Exercises: VP-406 and VP-148, both to be conducted by DSNA, which are focused on the En Route environment..

D90	VP356 detailed validation strategy step 1 - V2 and V3	The scope of the document was to help to maintain consistency and technical cohesion amongst the different validation activities, between 2011 and 2012 ensuring that all processes are kept in line with the overarching SESAR WP methodology and concept. This deliverable monitored the project Step 1 Validation Executions development focusing on the following key issues: • Consistency: so that all validation plans adhere together as consistent parts of a single deliverable; • Coherency: so that the components of each document contribute together in a coherent WP05.09 approach to Step 1 as a whole; By covering the generic and common aspects of all validation executions leading up to the Step 1 exercises. It describes the way in which the WP05.09 validation exercises were prepared in order to make easier to ensure that all plans have the necessary information and that they share the same background assumptions
D93	VP143 detailed validation strategy step 1 - V2 and V3	The scope of the document was to help to maintain consistency and technical cohesion amongst the different validation activities, between 2011 and 2012 ensuring that all processes are kept in line with the overarching SESAR WP methodology and concept. This deliverable monitored the project Step 1 Validation Executions development focusing on the following key issues: • Consistency: so that all validation plans adhere together as consistent parts of a single deliverable; • Coherency: so that the components of each document contribute together in a coherent WP05.09 approach to Step 1 as a whole; By covering the generic and common aspects of all validation executions leading up to the Step 1 exercises. It describes the way in which the WP05.09 validation exercises will be prepared in order to make easier to ensure that all plans have the necessary information and that they share the same background assumptions.
D86	VP148 detailed validation strategy step 1 - V2 and V3	The scope of the document was to help to maintain consistency and technical cohesion amongst the different validation activities,

		between 2011 and 2012 ensuring that all processes are kept in line with the overarching SESAR WP methodology and concept. This deliverable monitored the project Step 1 Validation Executions development focusing on the following key issues: • Consistency: so that all validation plans adhere together as consistent parts of a single deliverable; • Coherency: so that the components of each document contribute together in a coherent WP05.09 approach to Step 1 as a whole; By covering the generic and common aspects of all validation executions leading up to the Step 1 exercises. It describes the way in which the WP05.09 validation exercises will be prepared in order to make easier to ensure that all plans have the necessary information and that they share the same background assumptions.
D91	VP356 Validation exercise plans step 1 - V2 and V3	This Validation Plan covers two Validation Exercises: VP-355 and VP-356, both to be conducted by ENAV and focusing on the TMA operational environment.
D85	VP356 TMA initial use cases step 1	This document represents the contractual deliverable 05.09-D85 VP356 TMA Initial Use Cases Step 1 collecting the result of the work performed within the project task T05.09-T104 VP356 Develop TMA Initial Use Cases Step 1. Use Cases are described in the document according to the OSED template to complement the operational description of iCWP En-Route and TMA OFA (OFA06.02.01) The OSED was used as the basis for assessing and establishing operational, safety, performance and interoperability requirements for the related systems further detailed in the Safety and Performance Requirements (SPR) document. The OSED identified the operational services supported by several entities within the ATM community and includes the operational expectations of the related systems. This OSED detailed the operational concept for the Operational Focus Area (OFA): PAC006 iCWP EnRoute & TMA for Step 1.
D82	VP148 En Route initial use case step 1	This document represents the contractual deliverable 05.09-D82 VP148 En-Route Initial Use Cases Step 1 collecting the result

		of the work performed within the project task T05.09-T101 VP148 Develop En-Route Initial Use Cases Step 1. Use Cases are described in the document according to the OSED template to complement the operational description of iCWP En-Route and TMA OFA (OFA06.02.01) The OSED was used as the basis for assessing and establishing operational, safety, performance and interoperability requirements for the related systems further detailed in the Safety and Performance Requirements (SPR) document. The OSED identified the operational services supported by several entities within the ATM community and includes the operational expectations of the related systems. This OSED detailed the operational concept for the Operational Focus Area (OFA): PAC006 iCWP EnRoute & TMA for Step 1.
D83	VP356 TMA Initial Operational and SPR requirements step 1	This document contains a summary of the operational concept and descriptions of the operating environment and operating methods expected for Step 1. Also included are a set of requirements for the iCWP covering the operational aspects of the TMA environment. For Step 1, WP5.9 established a baseline for Operational and Human Factors requirements. The Operating Method was the starting point for evolution towards the SESAR vision. In reality each ANSP has a different starting point but each variation can be identified within the framework to provide the necessary point of origin. The document provided a set of requirements for the controller working position, for the following services: 1. Conflict Management 2. Collision Avoidance 3. Trajectory Management 4. ATM Network Management 5. Traffic Synchronisation
D84	VP356 TMA initial human factor requirements step 1	This document contains a summary of the operational concept and descriptions of the operating environment and operating methods expected for Step 1. Also included are a set of requirements for the iCWP covering human factors aspects of the TMA environment. For Step 1, WP5.9 established a baseline for Operational and Human

		Factors requirements. The Operating Method was the starting point for evolution towards the SESAR vision. In reality each ANSP has a different starting point but each variation can be identified within the framework to provide the necessary point of origin. The document provide a set of requirements for the controller working position:- 1. To guide the process of design 2. To allow the derivation of validation objectives and criteria (so that the fitness for purpose of the developed system from a HF perspective can be determined)
D80	VP148 En route initial operation and SPR requirements step 1	This document contains a summary of the operational concept and descriptions of the operating environment and operating methods expected for Step 1. Also included are a set of requirements for the iCWP covering the operational aspects of the En-Route environment The document provided a set of requirements for the controller working position, for the following services: 1. Conflict Management 2. Separation Provision 3. Trajectory Management 4. ATM Network Management 5. Traffic Synchronisation
D81	VP148 En route initial human factor requirements step 1	This document contains a summary of the operational concept and descriptions of the operating environment and operating methods expected for Step 1. Also included are a set of requirements for the iCWP covering human factors aspects of the En-Route environment The document provide a set of requirements for the controller working position:- 1. To guide the process of design 2. To allow the derivation of validation objectives and criteria (so that the fitness for purpose of the developed system from a HF perspective can be determined)

1.4 Contribution to Standardisation

No notable contribution from the project to standardisation activities.

1.5 Project Conclusion and Recommendations

The transversal nature of the Project 05.09 allowed to having an overall picture of HMI aspects within EN-Route and TMA working areas, which was used during supporting activities to ensure a coherent and consistent approach to HMI aspects, within single projects and at programme level.

In addition, the exploit of coordination at OFA level guaranteed to all actors involved in the programme the proactive participation to solve Gaps/Incoherencies/Overlaps identified by analysing projects deliverables and to make sure that the identified gaps/incoherencies/overlaps were addressed by the primary project in charge of the analysed activities.

The Project 05.09 produced HMI guideline requirements and a set of HF Criteria in order to be used in the HMI design activities in the other SESAR Projects. The main scope of this materials was to increase Projects awareness regarding WHAT and HOW the information should be presented and helped the HMI designers to proceed by using a common principles during the design of HMI objects in present and future ATM systems. This aspects represents the main difference with the old approach used to design HMI elements

Indeed the project 05.09 ensured the identification and the analysis of HMI&HF aspects and, through the support provided to the primary projects, provided contribute to improve the maturity level of the EN-Route and TMA operational concept.

In particular the project worked as coordinator of ENB06.02.01 where operational and technical aspects were considered in order to ensure that HMI requirements were properly identified, implemented and validated through the provision of En-Route and TMA CWP prototypes.

The project 05.09 worked in close coordination with 10.10.02 by providing input for the technical analysis and shared teams worked together to ensure mutual feedback, this approach in addition to the cyclical process are recommended in order to take advantage of operational and technical knowledge where the operational aspects and technical feasibility constraints drive the improvement process of ATM system. In addition both projects have taken into account documents produced in the WP16.

The HMI elements collected in the HMI FORUM are included in the D114 - HMI FORUM EXPORT deliverable. The first HMI library created by using HMI FORUM and the process defined for cooperation between Operational and Technical aspects represent the main outcome of the project and them are both recommended as starting point for the next SESAR 2020 activities.

.

2 References

[1] SESAR Programme Management Plan, Edition 03.00.01

[2] European ATM Master Plan

[3] Multilateral Framework Agreement ("MFA") signed between the SJU, EUROCONTROL and its 15 selected members on August 11, 2009, amended on 14 June 2010, 19 October 2010 and 2 July 2012

[4] Project B.01, Integrated Roadmap - DS14, D82, 00.01.00, 30/06/2015

[5] Project 05.09, HMI FORUM EXPORT, D114, 00.01.00, 15/01/2016

[6] Project 05.09, Report of Performed Supporting Activities in 2015, D109, 00.01.00, 15/12/2015

[7] Project 05.09, 2015 Technical Note, D105, 00.01.00, 30/11/2015

[8] Project 05.09, Report of performed HMI FORUM Activities in 2014, D112, 00.01.00, 24/02/2015

[9] Project 05.09, 2014 Technical Note, D104, 00.01.00, 09/01/2015

[10] Project 05.09, Report of performed activities in 2013, D107, 00.01.00, 03/03/2014

[11] Project 05.09, 2013 HMI operational Style guide iteration 2, D100, 00.01.00, 20/02/2014

[12] Project 05.09, Report of performed HMI demonstrator Activities 2013, D111, 00.02.00, 11/04/2014

[13] Project 05.09, 2013 Technical Note iteration 2, D103, 00.01.00, 16/12/2013

[14] Project 05.09, Technical Supervisor initial requirements and use cases step 2, D21, 00.01.00, 20/12/2012

[15] Project 05.09, Validation Report, D96, 00.00.01, 19/06/2012

[16] Project 05.09, VP356 Validation report, D99, 00.01.01, 21/05/2012

[17] Project 05.09, VP143 Validation exercise plans step 1 - V2 and V3, D94, 00.01.00, 29/02/2012

[18] Project 05.09, VP148 Validation Report, D89, 00.01.01, 23/05/2012

[19] Project 05.09, VP148 Validation exercise plans step 1 - V2 and V3, D87, 00.00.08, 19/07/2011

[20] Project 05.09, VP356 detailed validation strategy step 1 - V2 and V3, D90, 00.02.00, 03/10/2011

[21] Project 05.09, VP143 detailed validation strategy step 1 - V2 and V3, D93, 00.02.00, 03/10/2011

[22] Project 05.09, VP148 detailed validation strategy step 1 - V2 and V3, D86, 00.02.00, 03/10/2011

[23] Project 05.09, VP356 Validation exercise plans step 1 - V2 and V3, D91, 00.01.00, 24/06/2011

[24] Project 05.09, VP356 TMA initial use cases step 1, D85, 00.01.00, 01/06/2011

[25] Project 05.09, VP148 En Route initial use case step 1, D82, 00.01.00, 01/06/2011

[26] Project 05.09, VP356 TMA initial operational and SPR requirements step 1, D83, 00.01.01, 01/04/2011

[27] Project 05.09, VP356 TMA initial human factor requirements step 1, D84, 00.01.01, 01/04/2011

[28] Project 05.09, VP148 En route initial operation and SPR requirements step 1, D80, 00.01.01, 01/04/2011

[29] Project 05.09 , VP148 En route initial human factor requirements step 1, D81, 00.01.01, 01/04/201109,

-END OF DOCUMENT-