Final Project Report

Document information	
Project Title	Development & maintenance of the ATM Performance and Business Aspects of the European ATM Enterprise Architecture
Project Number	B.04.01
Project Manager	NATS
Deliverable Name	Final Project Report
Deliverable ID	D100
Edition	00.01.04
Template Version	03.00.04
Task contributors	
NATS.	

Abstract

This project developed the performance framework for the SESAR programme that defines a method for establishing Key Performance Areas (KPA), Key Performance Indicators (KPI) and Validation Targets aligned with the programme structure and the stakeholder expectations. The project then developed the targets themselves, maintaining them as the programme evolved.

The project also developed the architecture frame work to support the integration of the programme content into an overall model in order to support decision making. The European ATM Architecture (EATMA) is published along with the ATM Master Plan on the European ATM Portal

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Rational for rejection
None.

Document History

Edition	Date	Status	Author	Justification
00.00.01	1/12/2015	Draft	[redacted]	Short Justification statement
00.00.02	8/12/2015	Draft		Updated after Team Review
00.00.03	9/12/2015	Draft		Updated after comments received from WPB Leader
00.00.04	4/5/2016	Draft		Updated into Template Version 03.00.04
00.00.05	16/6/2016	Draft		Updated after SJU Feedback
00.00.06	30/6/2016	Draft		Final Version for Approval
00.01.00	08/07/2016	Final		Approved version for Handover
00.01.01	19/07/2016	Final		References added for deliverables
00.01.02	18/08/2016	Draft		Updated in line with SJU Comments for review and re-approval
00.01.03	19/08/2016	Final		Updated version after peer review and approvals
00.01.04	25/08/2016	Final		Approved Version for Handover to SJU

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This deliverable consists of SJU foreground.

Acronyms

Acronym	Definition
ATM	Air Traffic Management
ADD	The Architecture of the Technical Systems Description Document
CONOPS	Concept of Operations
CWP	Controller Working Position
DFS	DFS Deutsche Flugsicherung GmbH - German Air Navigation Service Provider
DOD	Detailed Operational Description
DSNA	Direction des Services de la Navigation Aérienne - French Air Navigation Service Provider
EA	Enterprise Architecture
EATMA	European Air Traffic Management Architecture
ENAIRE	Spanish Air Navigation Service Provider
EUROCONTROL	European Organisation for the Safety of Air Navigation
IR	Integrated Roadmap
IS	Industrial Support
KPA	Key Performance Area
KPI	Key Performance Indicator
NAF	NATO Architecture Framework
NATS	NATS Holdings Ltd. – Air Navigation Service Provider in the United Kingdom
OFA	Operational Focus Area
PCG	Programme Control Group
R&D	Research and Development
SESAR	Single European Sky Air Traffic Management Research Programme
SJU	SESAR Joint Undertaking
TAD	Technical Architecture Document
TOGAF	The Open Group Architecture Framework

1 Project Overview

The project developed the performance framework and validation targets for the programme along with the development and management of the European ATM Architecture.

The initial focus of the project also included the development of a business model for ATM which has subsequently been integrated into the European ATM Architecture.

The project was transversal and supported the work of other projects in the programme by providing a performance framework and validation targets at an OFA level and the European ATM Architecture (EATMA) in support of decision making. The project did not therefore contribute to any specific OFA or Operational Improvement Step.

Concerning performance the project developed the overall Performance Framework for SESAR. The frameworks describe how the high level goals set for the Single European Sky can be apportioned across the different SES initiatives including SESAR. The SESAR apportionment is then further broken down as a set of Key Performance Areas that were used to set targets for the Operational Focus Areas. Targets were also defined for the Solutions in support of the transition to SESAR 2020. The frameworks also described the methods for determining these targets.

The project was also responsible for developing the targets as described above. The targets were set against specific data sets of the Integrated Roadmap.

Concerning the Architecture; the project was responsible for the development of the Enterprise level architecture that collected and linked the different elements developed by the individual projects together against the NATO Architecture Framework (NAF). The architecture is held in a repository managed by Eurocontrol and published on the European ATM Portal as an integrated part of the ATM master Plan **Error! Reference source not found.**.

In support of the development of the architecture, the project developed and maintained a set of guidance material and maintained a wiki site that provided more detailed support material.

During the initial period of the programme, the project developed a business model for ATM; this is now integrated into the Architecture as a capability model linked to supporting operational processes.

In support of the development of the architecture the project developed a method to ensure that the content produced by the projects was identified and integrated into the architecture repository. This method, known as the Content Integration process involved a detailed set of integration activities governed by regular WebEx based meetings to track progress and address issues as they arose. The Architecture has been developed around the Operational Focus Area (OFA) structure for the operational aspects of the architecture and around the specific technical architectures. This has been transitioned to a structure which is based upon the Solutions in preparation for SESAR 2020. The Solutions encompass all aspects of a particular concept to be developed.

1.1 Project progress and contribution to the Master Plan

During the lifecycle of the project a method and framework for the identification of performance validation targets derived from the overall performance objectives for SESAR has been developed which has enabled the development of the validation targets for the Operational Focus Areas, SESAR Solutions and OI Steps within the SESAR programme. The nature of the framework has allowed for the relatively straightforward adjustment of the targets in response to changes arising as a result of the Integrated Roadmap change process.

The European Air Traffic Management Architecture was developed in order to support the decision making process within the programme and the deployment process. The EATMA consists of a

framework which defines what the architecture contains and the method which describes how the items in the architecture relate to each other through links.

The ATM Master Plan is based around the Operational Focus Areas, SESAR Solutions, Operational Improvement Steps and Enablers that are the statements of change to the ATM Operation and supporting assets which will deliver the desired improvements in performance. These Master plan elements are linked to the operational, service and system architecture components through the EATMA Content Integration process which then demonstrates very clearly what changes are required in order to meet the objectives of the ATM Master Plan.

1.2 Project achievements

WP B04.01 has provided the following input to the SESAR Programme:

Development of the framework for the European ATM Architecture (EATMA), and the publication of several versions of the EATMA and corresponding guidance material.

The guidance material describes how the NATO Architecture Framework (NAF) and The Open Group Architecture Framework (TOGAF) have been tailored to provide a framework for ATM and the SESAR programme. The document also describes the method for working with the projects to integrate their work into the architecture to provide the controlled delivery of new versions on a regular basis.

The way in which the method was operated through the Content Integration process required the various projects to interact with each other on a regular basis. This has resulted in a situation where there is an increased level of co-operation between participants in the projects and that has led to an overall improvement in the quality, consistency and coherency of the programme material output through this more collaborative way of working.

EATMA is supported by a configured repository maintained by Eurocontrol using the MEGA enterprise architecture tool. The publication of the architecture content was achieved by a conversion of the content to a set of Web friendly material that is integrated with the ATM Master Plan for publication on a single portal that is accessed via the hyperlink: https://www.eatmportal.eu/working.

Determination of the Performance Framework for the SESAR 1 programme and the SESAR 2020 Transition and of Performance Expectations for CONOPS 2020 Transition.

The frameworks describe how the SES high level goals are apportioned and used to develop targets that are aligned to the respective programmes and their stakeholder's expectations. The documents also describe the method to be used to develop the targets.

Determination of Validation Targets for SESAR1 Step1, 2 and 3, and for SESAR 2020 Transition.

The validation targets set expectations on the projects for the development of concepts that will ultimately deliver future ATM capabilities that can be deployed to improve European ATM performance. The targets represent performance requirements that SESAR Solutions/OFAs shall try to meet and represent a key input for the definition of the concept/solutions. Validation is defined later to try to meet them.

With respect to the Content Integration the process employed by B04.01 for the integration of content into EATMA has been adapted and extended to form the core methodology for the integration of all content produced by the Solution Projects in SESAR 2020. By maturing the architecture method used in SESAR 1 to the full capability driven approach anticipated by the NATO Architecture Framework (NAF), the project team have been able to integrate both areas of the project's responsibility, architecture and performance. The architecture is now able to directly link performance in terms of targets and results to the concepts and technologies developed in the programme, thereby bringing the architecture into the core of the SESAR 2020 programme.

1.3 Project Deliverables

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

Reference	Title	Description
B.04.01-D02	ATM Business Model	The ATM Business Reference Model provides a top level architectural description of the European ATM Enterprise which supports the definition of Enterprise Business Services and Enterprise Capabilities.
B.04.01-D106	Updated Validation Targets	Validation targets for the OFAs in Steps 1,2,3 and for SESAR2020 Transition.
B.04.01-D108	Performance Framework for SESAR 2020 Transition	The document describes the performance framework. The Performance Framework was iteratively evolved throughout the programme from an initial set of concepts to a mature framework
B.04.01-D135	Performance Expectations for CONOPS 2020 Transition	This document describes the performance expectations for the concepts described in the Transition Concept of operations developed by B04.02
B.04.01-D138	EATMA Guidance Material Version 7.0	Guidance Material for the development of EATMA. Iteratively developed throughout the lifecycle of EATMA.
B.04.01-D111	EA Framework support environment	An evaluation of tool sets for support of EATMA
B.04.01-D68	EATMA Version 8.0	Reports which describe the delivered elements of the European ATM Architecture (EATMA) for each version
B.04.01-D64	Fact Sheet	Fact Sheet describing EATMA Architecture for communication to the programme and stakeholders.

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1.4 Contribution to Standardisation

This project is a transversal activity so it has no impact on the definition of standards. The architecture has been framed to show how standards contribute to the deployment of solutions

1.5 Project Conclusion and Recommendations

The Project has developed 2 key products which will ensure that the research carried out by the SESAR programme can deliver changes to the way in which Air Traffic Management is carried out within the various operating environments across Europe so that the performance objectives of the Single European Sky can be achieved.

These products are the SESAR Performance Framework and the European Air Traffic Management Architecture (EATMA).

EATMA provides a single reference point for stakeholders to understand what is and has been delivered by the SESAR programme. The architecture elaborates on the ATM Master Plan and thus shows what the ATM participant will need to implement in order to comply with a Common Project that impacts on an environment in which they operate. It provides a logical description of the required operational and system behaviours along with the standards which are applicable. This will allow the stakeholder to determine the precise changes they need to make in order to deliver the objectives of the common project and thereby the desired performance improvements in collaboration with other stakeholders.

The Content Integration Process developed in support of EATMA has proven to be a most effective method for encouraging true collaboration and communication within and between the various SESAR projects addressing Operational and System aspects.

EATMA also provides a starting reference for SESAR 2020 describing the outcome of SESAR 1 and the validation targets for each solution.

The Performance Framework and Validation Targets provide a mechanism to decompose the overall performance improvements from the high level objectives set for the programme to define specific targets at an Operational Focus Area (OFA) level that can then be used to evaluate the outcome of the validation activities and therefore quantify the performance benefits which can be made from a particular operational concept. The framework and targets have been extended to address the introduction of SESAR Solutions in preparation for SESAR 2020. It is recommended that the performance framework provides the basis by which performance requirements be derived for the SESAR Solutions which will then provide a key input for the definition of the concept addressed by the Solution. A high emphasis will be taken on the performance framework by linking all solutions to dedicated validation targets within EATMA.

The integrated EATMA Structure, Content Integration Process and Performance Framework provide a very strong foundation for the SESAR 2020 Programme which will help to ensure that the Solutions are developed in a coherent and consistent fashion. It will also provide the mechanism to show that the Solutions can be deployed within an Operating Environment to deliver a tangible improvement in performance. The Content Integration process should be placed at the core of the SESAR 2020 programme operation to ensure and encourage the Solution Projects to collaborate to as great an extent as possible.

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] B.04.01,Updated ATM Business Reference Model,D03

[5] B.04.01,Final Project Report,D100

[6] B.04.01,Delivery Note for 4 Performance Group Participation,D104

[7] B.04.01,Delivery Note for SJU-PRB coordination,D105

[8] B.04.01,Performance Framework for SESAR 2020 Transition,D108

[9] B.04.01,EA Framework support environment,D111

[10] B.04.01,Report on WPB4.3 Support,D124

[11] B.04.01,EATMA Guidance Material Version 7.0,D138

[12] B.04.01,Cluster Review Report,D16

[13] B.04.01,Briefing Pack for SESAR Performance Partnership,D24

[14] B.04.01,Validation Targets for SESAR1 Step1 and for SESAR 2020 Transition,D42

[15] B.04.01,Fact Sheet,D64

[16] B.04.01,EATMA Version 7.0 Delivery Report,D67

[17] B.04.01,EATMA Version 8.0 Delivery Report,D68

[18] B.01, Integrated Roadmap Dataset 16, D84

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