Final Project Report

Document information	
Project Title	16.01.01 Accident Incident Model and Enhanced Safety Target Achievement Roadmap
Project Number	16.01.01
Project Manager	EUROCONTROL
Deliverable Name	Final Project Report
Deliverable ID	D18
Edition	00.01.00
Template Version	03.00.00
Task contributors	
EUROCONTROL, DFS, NATS, Airbus, ENAV, NORACON, THALES, AENA, INDRA	

Abstract

This document is the close our report for Project 16.01.01, the development of an accident incident model for Air Traffic Management that enables the setting of safety targets for SESAR technical and operation projects, and an estimation of the impact of SESAR projects on the ATM contribution to safety. This report summarizes the deliverables, milestones and achievements of the project.

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Rational for rejection

Document History

Edition	Date	Status	Author	Justification
00.00.01	18/08/2014	First draft	[redacted]	New Document
00.01.00	18/08/2014	Final draft		Issue 1

Intellectual Property Rights (foreground)

This deliverable consists of SJU foreground.

1 Final Project Report

1.1 Objectives

Project 16.01.01 the development of a top down Accident Incident Model (AIM) and an Enhanced Safety Target Achievement Roadmap (E-STAR) provides the tool to demonstrate increase required by SESAR. The AIM model provides a tool to predict the changes in risk contribution to aviation from air traffic management as a function of changes to the system arising from SESAR.

The objectives of 16.01.01 were to:

- provide a method by which the overall safety target for SESAR could be apportioned to individual ATM elements and thus enable the setting of safety target for ATM elements;
- predict the safety improvements that could be derived from SESAR technologies; and
- provide a tool that allowed “what-if”scenarios to be explored, enabling the identification of safety benefits of groups of OFAs.

16.01.01 allows all OIs and OFAs to establish the contribution to safety and the overall safety target as expressed in the master plan.

1.2 Achievements

Building on the Integrated Risk Picture (IRP) from EUROCONTROL, the project undertook a detailed review, development and validation of the qualitative and quantitative structure of IRP with 11 European ANSPs. Most notably, the model was developed with:

- DFS
- NATS – Enr & Oceanic;
- AVINOR;
- AENA;
- Austrocontrol
- DSNA; and

A second review of the model to validate it was undertaken with:

- ENAV
- ANTA
- Skyguide
- NAVP
- Slovenia Control

The resultant Microsoft Visio model was released as AIM V0.3 and was comprised of 7 models:

- Mid Air Collision (Enr)
- Mid Air Collision (TMA)
- Mid Air Collision (Oceanic) – Qualitative only
- Runway Collision
- Taxiway Collision
- Controlled flight into terrain
- Wake encounter model.

The Microsoft Visio AIM model was then transferred into a commercial risk assessment product (Reliability Work Bench) to provide a platform that allowed the necessary calculations of risk to be performed.

In parallel to the validation of qualitative structure of the AIM model, the EUROCONTROL Safety Target Achievement Roadmap (STAR) was developed to become the Enhanced Safety Target Achievement Roadmap (E-STAR). Compared to STAR, ESTAR provide an enhanced, more simple user interface and greater flexibility for the creation and editing of safety assumptions for OIs, OFAs and ODPs.

Finally a validation report was produced summarising the process of developing and reviewing AIM and the sources of data that used.

1.3 Deliverables

The following technical deliverables were produced by the project. This list does not include project management deliverables.

Table 1: Deliverables

D No	Refs[1]	Title	Comments
2	3	Leading indicators for ATM	A list of leading safety indicators that could be used for ATM, collated from ANSPs and other industry reports
3	4	Lagging indicators for ATM	A list of currently used and potentially usable safety indicators for ATM collated from ANSPs in 16.1.1
5	5	AIM Leading and Lagging Indicators	A summary of D2 and D3 and an appreciation of how they may be represented within the AIM & E-STAR process
7	6	Proof of concept AIM Use	An early deliverable of the (ANSP) reviewed AIM models for use by 16.06.01
9	7	Enhanced AIM platform	Transfer of the AIM models (Viso) into Reliability Work Bench
13	8	E-STAR	Transfer of the existing Excel based STAR into commodity MS Access software.
17	9	Test – Deliver SRM	Validation report developed for 16.06.01 summarising data sources and reviews & validation activities.

1.4 Conclusions

The AIM and E-STAR tool has been developed using the best available data in ATM from the widest pool of ANSP resources available to contribute. There is a good degree of confidence in the majority of the models, however it has not been possible to substantiate all models to the same extent. To this end some caution should be used when working with the Oceanic model (qualitative only), and the Wake encounter model.

16.01.01 has delivered the tools to enable an estimation of the safety benefits of SESAR and thus satisfy the original project objectives specified in Section 1.1 above.

[1] References refer to the document location in Section 2 below.

1.5 Final Comments

The AIM models will require ongoing, periodic, maintenance to ensure the data within remains relevant and up to date. Similarly, the completeness of the models will require review to ensure they account for all relevant accident types. This activity will now be adopted by 16.06.01.

The AIM model has proved of interest to the FAA who, via a coordinated activity with SJU, have used the AIM models as “inspiration” for their ISAM platform, and remain interested in the use of AIM and ESTAR in Europe.

Further, ANSPs and FABEC partners are requesting a review of AIM to determine whether it is a suitable tool by which to integrate safety data to provide a “complete” view of ATM risk. This local use of AIM by ANSPs goes beyond the original envisaged use of AIM for SESAR and indicates clearly the interest in AIM and the potential to support safety activities in the wider ATM Network.

It remains the responsibility of 16.06.01 to apply the AIM and E-STAR tool within SESAR.

2 References

[1] SESAR Programme Management Plan, Edition 03.00.01

[2] European ATM Master Plan, Edition 2

[3] **Leading indicators**: SESARJointUndertakingProgramme> WP16>Project16.01.01> ProjectExecution>02_Leading_Lagging>02_Leading

[4] **Lagging indicators:** SESAR_Joint_Undertaking_Programme>WP_16>Project_16.01.01> Project Execution>02_Leading_Lagging>01_Lagging

[5] **Incorporation into AIM:** SESAR_Joint_Undertaking_Programme>WP_16>Project_16.01.01> Project Execution>02_Leading_Lagging > 04_Incorporation into AIM

[6] **AIM Proof of Concept:** SESAR_Joint_Undertaking_Programme>WP_16>Project_16.01.01> Project Execution>03_AIM Development>AIM-V10-2-Ap2012-Draft-Quantification

[7] **AIM Reliability Work Bench**: SESAR_Joint_Undertaking_Programme>WP_16>Project 16.01.01 >Project_Execution>03_AIM_Development>01_Latest_AIM_Models_Sept_2013> Master_File_7_Models_Updated_200513

[8] **E-STAR:** SESAR_Joint_Undertaking_Programme > WP_16 > Project_16.01.01 > Project Execution>04_ESTAR Development>01_ESTAR>ESTAR_August_2002>ESTAR 15 August

[9] **Test (validation report):** SESAR Joint Undertaking Programme > WP 16 > Project 16.01.01 > Project Execution>05_Testing_Verification > Validation_00.01.00

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