Contextual note – SESAR Solution description form for deployment planning

Purpose:

This contextual note introduces a SESAR Solution (for which maturity has been assessed as sufficient to support a decision for industrialization) with a summary of the results stemming from R&D activities contributing to deliver it. It provides to any interested reader (external and internal to the SESAR programme) an introduction to the SESAR Solution in terms of scope, main operational and performance benefits, relevant system impacts as well as additional activities to be conducted during the industrialization phase or as part of deployment. This contextual note complements the technical data pack comprising the SESAR deliverables required for further industrialization/deployment.

Improvements in Air Traffic Management (ATM)

The basic Extended ATC Planner aims at bridging the gap between Air Traffic Flow and Capacity Management (ATFCM) and Air Traffic Control (ATC) providing real-time and fine-tuning measures to solve ATFCM hotspots and to perform early measures to alleviate complexity closest to ATC activities.
The solution consists of an automated tool and associated procedures supporting the basic communication between the Local DCB position and the Controllers' Work Positions allowing the EAP and the ATC team in identifying, assessing and resolving local complexity situations. The basic EAP relies on a real time integrated process for managing the complexity of the traffic with capability to reduce traffic peaks through early implementation of fine-tuned solutions to solve workload imbalances at the local level, compatible with the short term timeframe of execution phase of the flights.

The basic EAP concept introduces also a **new role**, the EAP role (Extended ATC Planning), which is intended to fill the gap between ATFCM and ATC:

- The **EAP is not an additional staff**: it is a **role** covering a set of services/functions that can be assumed by different personnel of the ATSU (already existing actors, like TC or new actors like MSP or LTM);

- It is highly recommended that the EAP is holding or has held an ATCO rating in the relevant ATSU's airspace

The main benefits expected from the basic EAP function are principally:

- To help providing a **better service to airspace users** through reduced delays, better punctuality, less ATFCM regulations, whilst maintaining or even increasing safety.
- To **increase the controllers' productivity** contributing thus to increase the overall en-route capacity of the ACC.

In addition, as it will help anticipating the resolution of ATC workload imbalances, the basic EAP concept can be considered as a **potential enabler** for the deployment of functionalities such as **Extended AMAN** or **Free Routing** operations.

Operational Improvement Steps (OIs) & Enablers

Applicable Integrated Roadmap Dataset is DS18.

The solution #118 addresses the following OI step:

- **CM-0106**: Initial support to INAP: basic EAP (Extended ATC Planning) function

The following enablers are considered as required in DS17:

- **ER-ATC-164**: ATC tools to re-organize traffic flows to reduce complexity in the execution phase
- **PRO-220a**: ATC Procedures related to Detection and Resolution of Complexity, Density and Traffic Flow Problems
- **PRO-220b**: FCM procedures to describe how detection and resolution of complexity, density or traffic flow issues are managed.

Background and validation process

The SESAR Solution #118 has been validated through a **live trial exercise** performed by DSNA in June 2015 in Reims UAC.

For the validation, DSNA developed a dedicated toolset which was deployed on 10 CWPs (controlling more or less 60-70% of the airspace) in Reims operational room, namely:

- An advanced working position for the EAP role termed ***initial EAP Working Position*** (iEWP); and
- A communication tool for the controllers: ***CWP Com Tool.***

The exercise took place over two weeks:

- The first week aimed at gathering the reference scenarios, and
- The second week was dedicated to the live trials and the implementation of the solution's scenarios. During this week, three Flow Managers from Reims rotated on the EAP role to manage the hotspot situations, using the iEWP to apply STAMs **in coordination with the Flow Manager on duty.**

The **V3 maturity level** of the basic EAP function has been confirmed by the implementation of the **4ME system** in Reims ACC (approved by the French NSA in December 2016). Indeed this new operational system supports direct communication between CWPs and EAP' supporting ATFCM information exchange for shared situation awareness between CWPs and iEWP.

Results and performance achievements

The main recommendations for industrialization and further deployment can be summarised as follows:

- The **performance trends** observed for the basic EAP functions need to be **refined and extended to other performance areas** that will allow to better evaluate (and potentially increase) the applicability of the solution to other environments.

  Note that solutions in SESAR 2020 cover an evolution of the solution #118, with the following objectives:

- The EAP concept needs to be **further developed to cover a wider scope in a full INAP environment** (complexity management with assessment of the best performing options between capacity and flow/trajectory measures (Decomplexification / de-confliction / synchronization /

sequencing); enhanced coordination and situation awareness on both DCB and ATC sides, including XMAN & extended AMAN);

- **Roles and responsibilities need also to be clarified** in the targeted full INAP environment as well as data update and exchanges.

Recommendations and Additional activities

The main recommendations for next phase can be summarised as follows:

- The EAP concept needs to be **further developed to cover a wider scope in a full INAP environment** (complexity management with assessment of the best performing options between capacity and flow/trajectory measures (Decomplexification / de-confliction / synchronization / sequencing); enhanced coordination and situation awareness on both DCB and ATC sides, including XMAN & extended AMAN);
- The **performance trends** observed for the basic EAP functions need to be **refined and extended to other performance areas** that will allow to better evaluate (and potentially increase) the applicability of the solution
- **Roles and responsibilities need also to be clarified** in the targeted full INAP environment as well as data update and exchanges.

Actors impacted by the SESAR Solution

The actors/roles impacted by the operations of the SESAR Solution#118 are as follows:

- The **Local Traffic Manager** (LTM) who is responsible for identifying the adequate dDCB (dynamic Demand and Capacity Balancing) measures to be implemented in case of traffic imbalance;
- The **Extended ATC Planning** (EAP) is a **new role** that will benefit from a global vision on traffic through several sectors; it will then be able to operate decomplexification tasks;
- The **ATC Sector Planning Controller** who will be the interface between the EAP and his Tactical Controller.
- The **ATC Sector Tactical Controller** of the Implementing Sector will be impacted by the EAP actions.

In addition, Airspace Users (mostly Airlines) will benefit from the improvements brought by SESAR Solution#118 but are not directly involved in the operations of the solution.

Impact on Aircraft System

No impact on the aircraft systems is foreseen.

Impact on Ground Systems

The changes introduced by the Solution #118 will impact the **En-Route / Approach ATC systems** deployed at the **En-Route ATC Centres**, to support the air traffic controllers in the provision of Air Traffic Services.

The impact on the **En-Route / Approach ATC systems** will be twofold:

1. The basic EAP (bEAP) function will require appropriate tool to **support the actions of the EAP role**, namely:
    - Monitoring the hotspots evolution;
    - Elaborating appropriate ATFCM measures (STAM) or to initiate short term actions on the traffic to be coordinated with the Planning Controller,
    - Monitoring the implementation until the concerned flight has conformed to the measure, and
    - Communicating with the ATC Sector Planning and Tactical controllers' CWP.
2. On the **ATCO team's side**, the bEAP function will require appropriate support too for:
    - Communicating with the EAP role work position;
    - Displaying the proposed measures from the EAP to the Planning Controller;
    - Supporting a negotiation dialogue with the EAP; and
    - Informing back the EAP on the implementation of the proposed measures.

Regulatory Framework Considerations

No specific topic in the field of the regulatory framework has been identified to be considered in deployment, **beyond the applicable regulations currently existing.**

Standardization Framework Considerations

No specific impact on the standardisation framework has been identified.

Considerations of Regulatory Oversight and Certification Activities

No specific regulatory oversight or certification activities are foreseen **beyond the applicable regulations currently existing**

Solution Data pack

Solution #118 Data pack consists in this **Contextual Note**

SESAR Solution #118 - Contextual Note - 01.00.02.docx

And the following documents:

- **SPR/INTEROP/OSED** including the following documents:
    - Part I - Safety and Performance Requirements (SPR) and Interoperability Requirements (INTEROP) / OSED:
      SESAR Solution #118 - SPR INTEROP OSED V3 - Basic EAP - 01.00.01 - Part I.docx
    - Part II - Safety Assessment Report:
      SESAR Solution #118 - SPR INTEROP OSED V3 - Basic EAP - 01.00.01 - Part II - SAR.docx

- Part IV - Human Performance Assessment Report:
  SESAR Solution #118 - SPR INTEROP OSED V3 - Basic EAP - 01.00.01 - Part IV - HPAR.docx

- Part V - Performance Assessment Report:
  SESAR Solution #118 - SPR INTEROP OSED V3 - Basic EAP - 01.00.01 - Part V - PAR.docx

- **Technical Specification** (TS):
  SESAR Solution #118 - TS IRS V3 - Basic EAP - 01.00.01.docx

- **Cost Benefit Analysis** (CBA):
  SESAR Solution #118 - CBA V3 - Basic EAP - 01.00.01.docx

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