SESAR EFPL Extension v1.0 BETA

Primer

30-May-2016

Version: 1.0 BETA

The Flight Information Exchange Model (FIXM) is an exchange model capturing Flight and Flow information that is globally standardised. It supports, like AIXM and WXXM, a "core + extension" mechanism: the core part contains the pieces of flight information that are globally recognised and which are endorsed by the FIXM CCB, while extensions supplement the core FIXM model in order to support additional requirements from particular communities of interest. *[adapted from the FIXM Strategy v1.0]*

This document serves as an introduction to the **SESAR EFPL Extension to FIXM** developed by SESAR. It describes at high level the content of the extension.

The **SESAR EFPL Extension** is a **research extension** which **shall not be used for any operational purposes**. It is delivered to the FIXM CCB and made publicly available on www.FIXM.aero so that its content can support as appropriate further discussions related to FF-ICE/1 implementation, in accordance with the rules for governing the FIXM content described in the FIXM CCB Charter v1.0.

Copyright (c) 2016, SESAR Joint Undertaking

==========

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

**** Redistributions of source code must retain the above copyright notice, this list of conditions and the disclaimer.***

**** Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the disclaimer in the documentation and/or other materials provided with the distribution.***

**** Neither the names of the SESAR Joint Undertaking nor the names of its contributors may be used to endorse or promote products derived from this specification without specific prior written permission.***

DISCLAIMER

THIS SPECIFICATION IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

==========

Editorial note: this license is an instance of the BSD license template as provided by the Open Source Initiative:

http://opensource.org/licenses/BSD-3-Clause

Details on the SJU and its members: http://www.sesarju.eu/players/members

Table of Contents

Introduction 4
Overview of the SESAR EFPL 4
Content of the SESAR EFPL Extension 5
Plans for future version of the extension 6

Document History

Version	Version Type	Author	Description of Changes
1.0 Beta	Beta version	Thomas Eschenhagen, LUFTHANSA SYSTEMS Francisco Graciani Higuero, EUROCONTROL Hubert Lepori, EUROCONTROL	First version of the document

Intellectual Property Rights (foreground)

This document consists of SESAR foreground. It is made available subject to the BSD license found on the front page of the document.

Introduction

This document provides a high-level introduction to the **SESAR EFPL extension** to FIXM, which is an **extension to FIXM v3.0** developed by SESAR, a European ATM research programme, in order to capture the specific pieces of information required by the SESAR EFPL.

The **SESAR EFPL Extension** is a **research extension** which **shall not be used for any operational purposes**. It is delivered to the FIXM CCB and made publicly available on www.FIXM.aero so that its content can support as appropriate further discussions related to FF-ICE/1 implementation, in accordance with the rules for governing the FIXM content described in the FIXM CCB Charter v1.0.

Intended Readership

The target audience for the document is:

- Any FIXM Stakeholders having an interest in the SESAR Extended Flight Plan business;
- The FIXM community as a whole, who may use the extension's components as inputs to the FIXM core discussions, for instance in support of the FIXM Implementation guidance development;
- The FIXM CCB, who may ultimately decide to promote the content of this extension, or a subset of it, to future Core FIXM versions.

Important notice

The SESAR EFPL Extension is a research extension which shall not be used for any operational purposes. The extension is released as a BETA version only: its content is expected to be reasonably stable but the extension is still likely to contain technical bugs.

Overview of the SESAR EFPL

The extended flight plan (EFPL) allows the exchange of trajectory information - in addition to ICAO 2012 flight plan information - between Aircraft Operators' Flight Operations Centre (FOC) and ATM in the short-term planning phase through SWIM-based B2B services.

The extended flight plan is an extension of the ICAO 2012 FPL. New information from the airspace users encompasses:

- *The 4D trajectory (filed trajectory) as calculated by the FOC flight planning system in support of the generation of the operational flight plan. The 4D trajectory information is not limited to 4D points. It contains additional elements for each point of the trajectory such as speed, and aircraft mass;*
- *Flight specific performance data: the climbing and descending capabilities of the aircraft, specific to the flight.*

[Extracted from ICAO ATMRPP paper entitled *European Trajectory Evaluation Activity*]

Note: the SESAR EFPL (extended flight plan) is not to be confused with the ICAO FF-ICE eFPL (electronic flight plan).

The extended flight plan can be treated as a concept for the provision of detailed flight information. Further details about the SESAR EFPL activities can be obtained at this link.

The SESAR EFPL extension to FIXM was used during a SESAR trial exercise aiming to validate the EFPL concept; it successfully enabled, in the context of this trial, the exchange of 4D trajectory information between Airspace Users (AU) and the European Network Manager (NM):

- AU to NM: the 4D trajectory (filed trajectory) as calculated by the FOC flight planning system;
- NM to AU: as a response, the NM calculated 4D trajectory (accepted trajectory).

Content of the SESAR EFPL Extension

The **SESAR EFPL Extension** is an extension to **FIXM Core v3.0** that captures the pieces of information required by the EFPL in addition to the ICAO FPL 2012 content.

The SESAR EFPL extension beta contains the following artefacts:

- Main components (Copyright (c) 2016, SESAR Joint Undertaking)
    - A **Logical Model** providing a UML representation of the additional elements required by the EFPL.
    - **XML schemas** derived from the Logical Model of the extension.
- Supporting components
    - XML schemas further describing the actual payload of the services that exchanged EFPL information[1] (Copyright (c) 2016, EUROCONTROL)
    - **XML samples** serving as concrete examples of EFPL generated by an Airspace User. **Courtesy of Lufthansa Systems** (Copyright (c) 2016, Lufthansa Systems)**.**

Note: The XML schemas of the SESAR EFPL extension were implemented by SESAR partners during the verification and validation exercise of the EFPL. This implementation required a few manual adaptations to the XML schemas which were not consistently mirrored in the Logical Model. Therefore, minor differences exist between the Logical Model and the XML schemas of the extension.

The extension does not have any supporting documentation except this Primer.

The content of the SESAR EFPL Extension reflects the state of the service provided by the European Network Manager for the exchange of extended flight plan data as of May 2016. It also highlights that the FIXM Core v3.0 does not contain sufficient data elements to support such an exchange of extended flight plan data.

[1] The payload of these services contained more than pure “FIXM + EFPL extension”

Plans for future version of the extension

As of May 2016, there is no plan to further update the extension, and the extension will stay as beta version until further notice.

The content of FIXM Core v4.0, to be released in August 2016, will influence the need to create or further update an EFPL extension using this new core base. The future development of the B2B services provided by NM is also expected to influence any further development of the EFPL extension.