2023_045_AF5

“FF-ICE Implementation into FDPS systems” by ANS CR

26. listopadu 2025, MD ČR

Konference CEF 2025

Lukáš Řezníček (reznicek@ans.cz)

Content

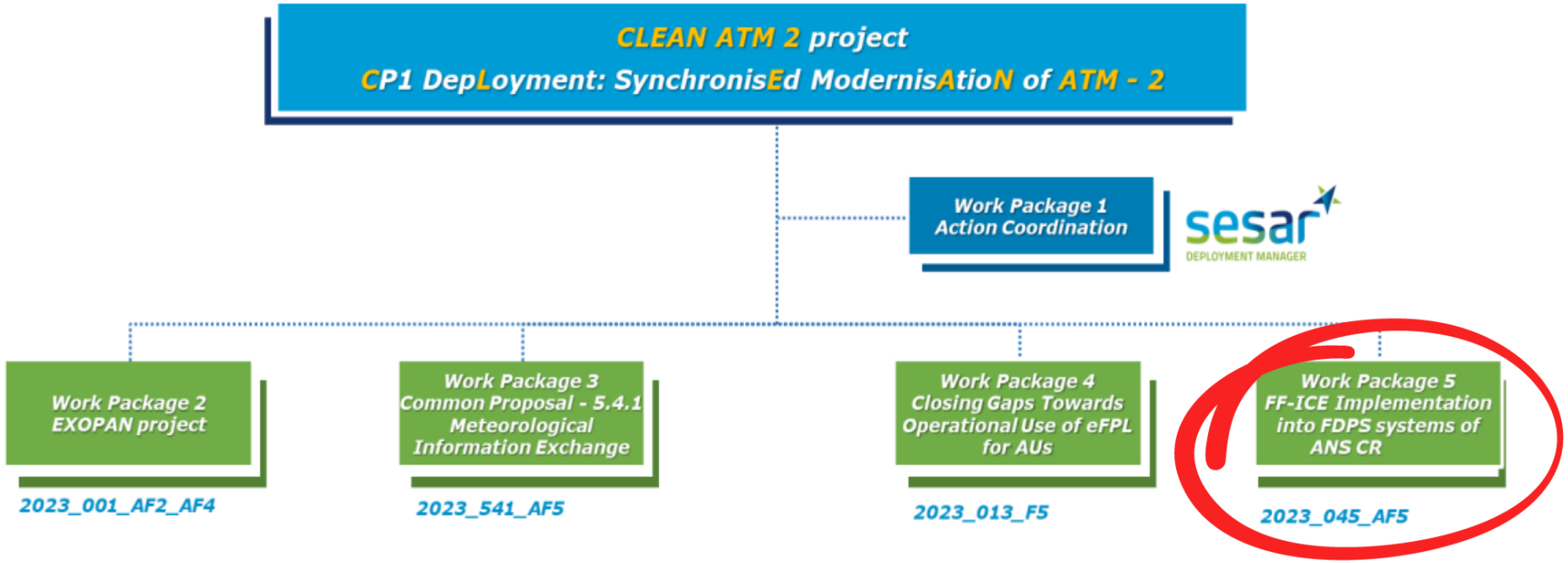
1) CINEA/SDM contribution & support
2) What is FF-ICE about
3) Implementation status in ANS CR
4) Lessons learned
5) Questions

Co-funded by
the European Union

sesar
DEPLOYMENT MANAGER

CINEA/SDM contribution & support

FF-ICE implementation in ANS CR is co-funded by the European Union under the CEF2 Programme coordinated by the SESAR Deployment Manager:

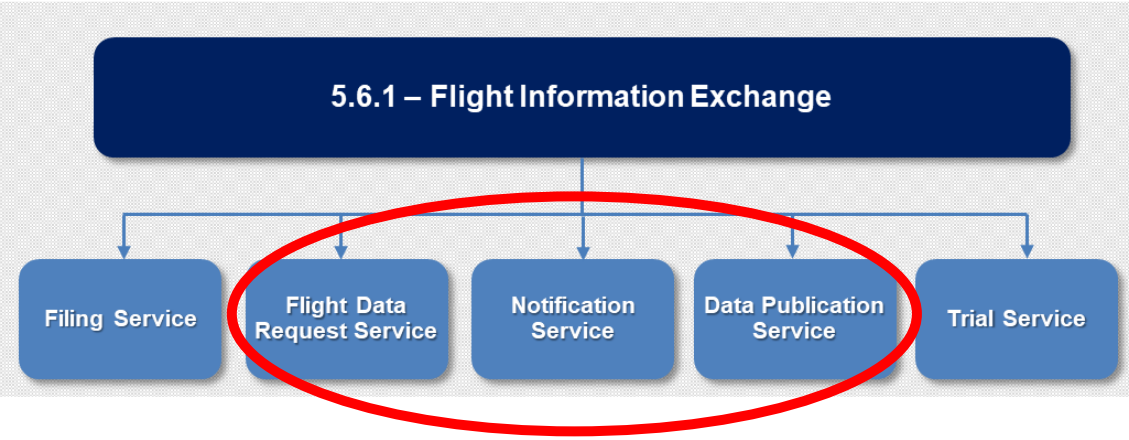


- 02/2024 – 12/2025
- 5 993 609.00 €
- 50 % co-funded

What is FF-ICE about

Flight and Flow Information for a Collaborative Environment (FF-ICE)

- Global perspective => one of the ICAO enabler for Trajectory Based Operations (TBO)
- European perspective => Part of **AF5 – SWIM** under CP1 regulation **aiming to harmonize the exchange** of Aeronautical, Weather, Network and Flight information for all Stakeholders available at the right time, in the right way to the appropriate CDM participant
- FF-ICE Release 1 (FF-ICE/R1) addresses the exchange of enriched pre-departure flight information, using SWIM information services
- FF-ICE/R1 is the first step initiating the business transformation required for TBO
- The five FF-ICE services in scope of CP1:



ANSP as the Service Consumer

Implementation status in ANS CR

Two Flight Data Processing Systems **(FDPS)** to communicate flight plan related data – main ATM system **(TopSky)**; fallback/support system **(ESUP)**

- Each has its own connection to NMOC B2B and set of certificates (PREOPS/OPS) for B2B FF-ICE services and FlightData services
- Communication path via PENS

TopSky – Publication services

- ✓ 12/2023 – Contract signed (Thales)
- ✓ 09/2024 – PREOPS certificate available
- ✓ 01/2025 – CDR completed
- ✓ 06/2025 – FAT completed
- ✓ 09/2025 – SAT completed
- ✓ **11/2025 – READ test**
- ❑ OPS certificate READ

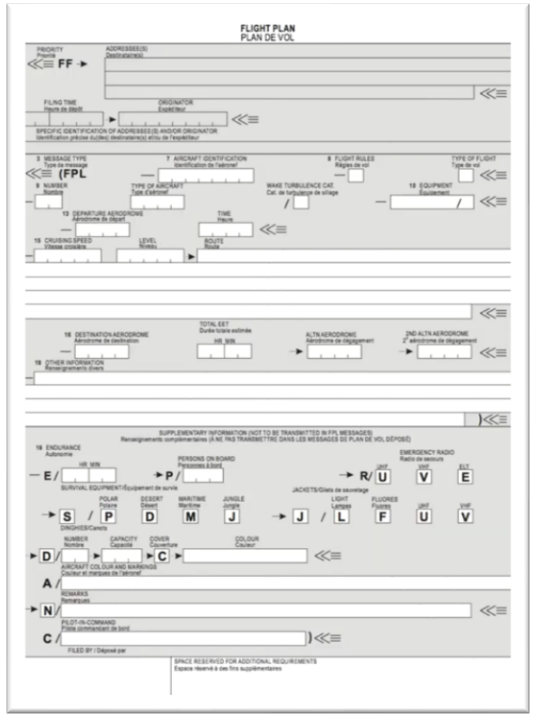
Validation with **NMOC**

ESUP – Publication and Notification services

- ✓ 03/2024 – Contract signed (CS Soft)
- ✓ 05/2024 – CDR completed
- ✓ 09/2024 – PREOPS certificate available
- ✓ 12/2024 – SAT1 (READ) completed
- ✓ **01/2025 – READ test**
- ✓ 07/2025 – OPS certificate READ
- ✓ 09/2025 – SAT2 (WRITE)
- ✓ **11/2025 – WRITE test**
- ❑ OPS certificate WRITE

Practical examples

FPL (ICAO FPL2012)



(FPL-TEST123-IS
-A320/M-SDE2E3FGHIJ1RWXYZ/LB1
-LFBO1735
-N0365F240 LACOU DCT CHALA DCT CNA DCT MANAK
-LFRS0043 LFRN
-PBN/A1B1C1D1O1S2 NAV/RNP2 DAT/V DOF/230620 REG/FABCD EET/LFFF0007 LFRR0034)

Flight Plan shown eFPL (FIXM)

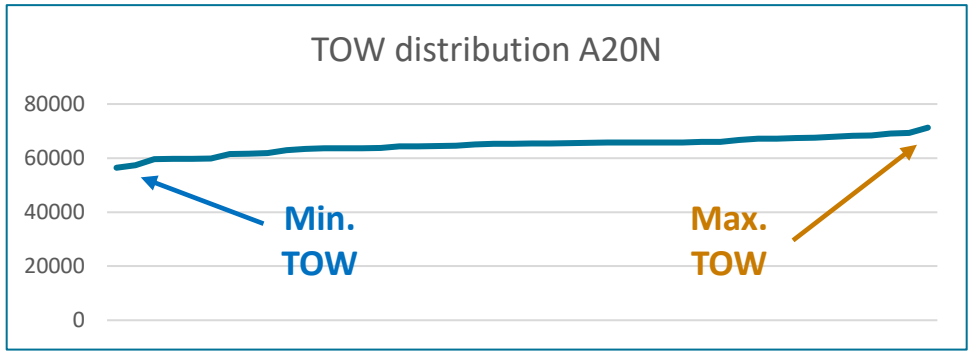
```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<ffice:FficePublicationMessage xmlns:ffice="eurocontrol/cfmu/b2b/FficeServices"
xmlns:cm="eurocontrol/cfmu/b2b/CommonServices" xmlns:ns4="http://www.fixm.aero/base/4.3" xmlns:ns5
="http://www.fixm.aero/flight/4.3" xmlns:ns6="http://www.fixm.aero/ffice/1.1/bugfix/2024.04.30"
xmlns:ns7="http://www.eurocontrol.int/nm/fixm/ext/1.5" xmlns:ns9="http://www.fixm.aero/app/ffice/1.1"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <uuid>8c7076e9-b87d-4b07-bb37-b70cb12f69ac</uuid>
  <timestamp>2024-12-16 00:22:06 364</timestamp>
  <messageExchangePattern>PUBLISH_SUBSCRIBE</messageExchangePattern>
  <type>BUSINESS_MESSAGE</type>
  <topic>FFICE_PUBLICATION</topic>
  <subscriptionUuid>73fad5fd-7b95-46e2-987e-b12f272a0f5c</subscripti
  <subscriptionVersion>1</subscriptionVersion>
  <parentMessageId>20241216002202IAT07124488</parentMessageId>
  <flight_v4_3>
    <ns5:aircraft>
      <ns5:aircraftAddress>3C666C</ns5:aircraftAddress>
      <ns5:aircraftApproachCategory>C</ns5:aircraftApproachCategory>
      <ns5:aircraftType>
        <ns5:icaoAircraftTypeDesignator>A321</ns5:icaoAircraftTypeDe
      </ns5:aircraftType>
      <ns5:capabilities>
        <ns5:communication>
          <ns5:communicationCapabilityCode>E2 E3 Y</ns5:communicatio
          <ns5:datalinkCommunicationCapabilityCode>J1</ns5:datalinkC
          <ns5:otherDatalinkCapabilities>VM</ns5:otherDatalinkCapabi
        </ns5:communication>
        <ns5:navigation>
          <ns5:navigationCapabilityCode>D F G I L O W X</ns5:navigat
          <ns5:performanceBasedCode>C1 B1 A1 O1 S1 S2 D1</ns5:perfor
          <ns5:requiredRunwayVisualRange uom="KM">0.075</ns5:require
        </ns5:navigation>
        <ns5:standardCapabilities>STANDARD</ns5:standardCapabilities
        <ns5:surveillance>
          <ns5:surveillanceCapabilityCode>B1 H</ns5:surveillanceCapa
        </ns5:surveillance>
      </ns5:capabilities>
      <ns5:registration>DAISL</ns5:registration>
      <ns5:wakeTurbulence>M</ns5:wakeTurbulence>
    </ns5:aircraft>
    <ns5:arrival>
      <ns5:destinationAerodrome>
        <ns4:locationIndicator>EDDB</ns4:locationIndicator>
      </ns5:destinationAerodrome>
      <ns5:destinationAerodromeAlternate>
        <ns4:locationIndicator>EDDC</ns4:locationIndicator>
      </ns5:destinationAerodromeAlternate>
    </ns5:arrival>
    <ns5:departure>
      <ns5:departureAerodrome>
        <ns4:locationIndicator>EDDM</ns4:locationIndicator>
      </ns5:departureAerodrome>
      <ns5:estimatedOffBlockTime>2024-12-16T09:50:00Z</ns5:estimatedOffBlockTime>
    </ns5:departure>
    <ns5:extension xsi:type="ns7:NmFlightExtensionType">
      <ns7:ifpsFlightPlanIndicator>MODESASP</ns7:ifpsFlightPlanIndicator>
      <ns7:ifpsIdentifier>AT07124488</ns7:ifpsIdentifier>
    </ns5:extension>
    <ns5:flightIdentification>
      <ns5:aircraftIdentification>DLH2206</ns5:aircraftIdentification>
      <ns5:gufi codeSpace="urn:uuid" creationTime="2024-12-16T00:22:02Z"
namespaceDomain="FULLY_QUALIFIED_DOMAIN_NAME"
namespaceIdentifier="ATM.DGXZEWXS2HNTZWQWMS5SAHN5C3RLBXMUAW50.LIDO.LHSYSTEMS.COM">E3365E8D-0386-4DFA-
AAA7-F5753A09C60E</ns5:gufi>
      <ns5:iataFlightDesignator>
        <ns5:flightNumber>2206</ns5:flightNumber>
        <ns5:iataOperatorCode>LH</ns5:iataOperatorCode>
      </ns5:iataFlightDesignator>
    </ns5:flightIdentification>
    <ns5:flightPlanOriginator>
      <ns4:contact>
        <ns4:onlineContact>
          <ns4:linkage>HEMANT</ns4:linkage>
          <ns4:network>
            <ns4:type>AFTN</ns4:type>
          </ns4:network>
        </ns4:onlineContact>
      </ns4:contact>
      <ns4:identifier>NA</ns4:identifier>
      <ns4:identifierDomain>FF-ICE</ns4:identifierDomain>
      <ns4:name>DLH</ns4:name>
    </ns5:flightPlanOriginator>
    <ns5:flightRulesCategory>I</ns5:flightRulesCategory>
    <ns5:flightType>S</ns5:flightType>
    <ns5:operator>
      <ns4:designatorIcao>DLH</ns4:designatorIcao>
    </ns5:operator>
    <ns5:remarks>TCAS</ns5:remarks>
    <ns5:routeTrajectoryGroup>
      <ns5:agreed>
        <ns5:element>
          <ns5:alongRouteDistance uom="M">0.0</ns5:alongRouteDistance>
          <ns5:elementStartPoint>
            <ns4:aerodromeReferencePoint>
              <ns4:locationIndicator>EDDM</ns4:locationIndicator>
            </ns4:aerodromeReferencePoint>
          </ns5:elementStartPoint>
          <ns5:point4D>
            <ns5:level>
              <ns4:altitude uom="M">457.20001220703125</ns4:altitude>
            </ns5:level>
            <ns5:pointProperty>
              <ns5:propertyType>AIRPORT_REFERENCE_LOCATION</ns5:propertyType>
            </ns5:pointProperty>
```

From relatively short and readable **FPL2012 based format** into much bigger **FIXM (Flight Information Exchange Model) format** using **XML (eXtensible Markup Language)** code supporting the **eFPLs (Electronic Flight Plans)** that include detailed data like 4D trajectory and performance metrics.

Practical examples – Take off weight (TOW) impact on our FDPS

Flights ADEP LOWW, climbing over LKAA

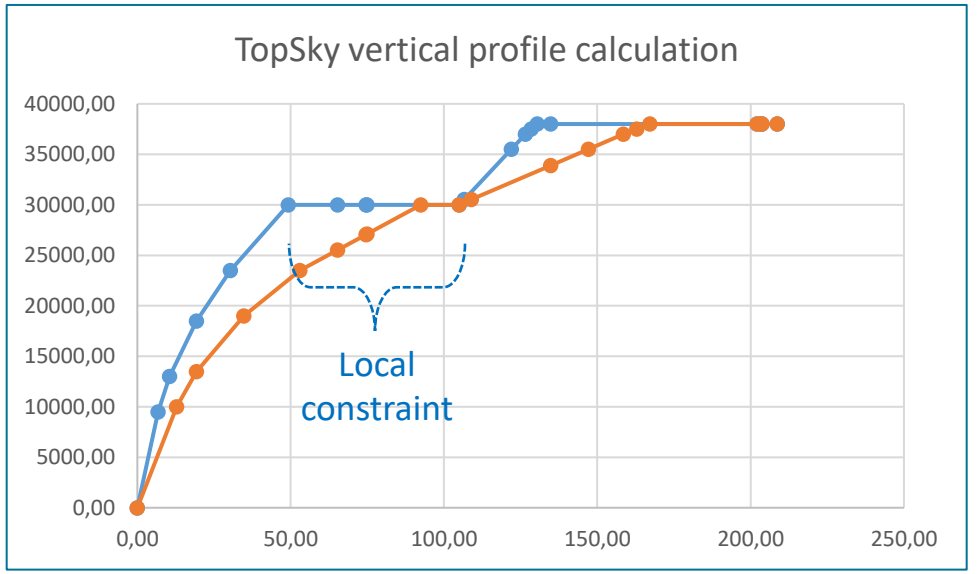
- eFPLs filled on PREOPS one week in Sep 24
- Extracted TOW for A20N – distribution of TOW was rather linear (Y – TOW (kg))



Vertical profile calculated by TopSky

- **Blue line** – Min. TOW
- **Orange line** – Max. TOW

(Y – flight level, X – distance)



Results:

- ✓ Analysis of TOW impact on the vertical profile makes sense
- ✓ It leads to improved accuracy of system functions (e.g. MTCD)
- ✓ And provides better traffic predictions during the execution phase

Practical examples – TOC/TOD presentation

Flight LKPR-LOWW

Planned trajectory with TOC/TOD from eFPL can be displayed by ATCOs

TOC is displayed as RFL value

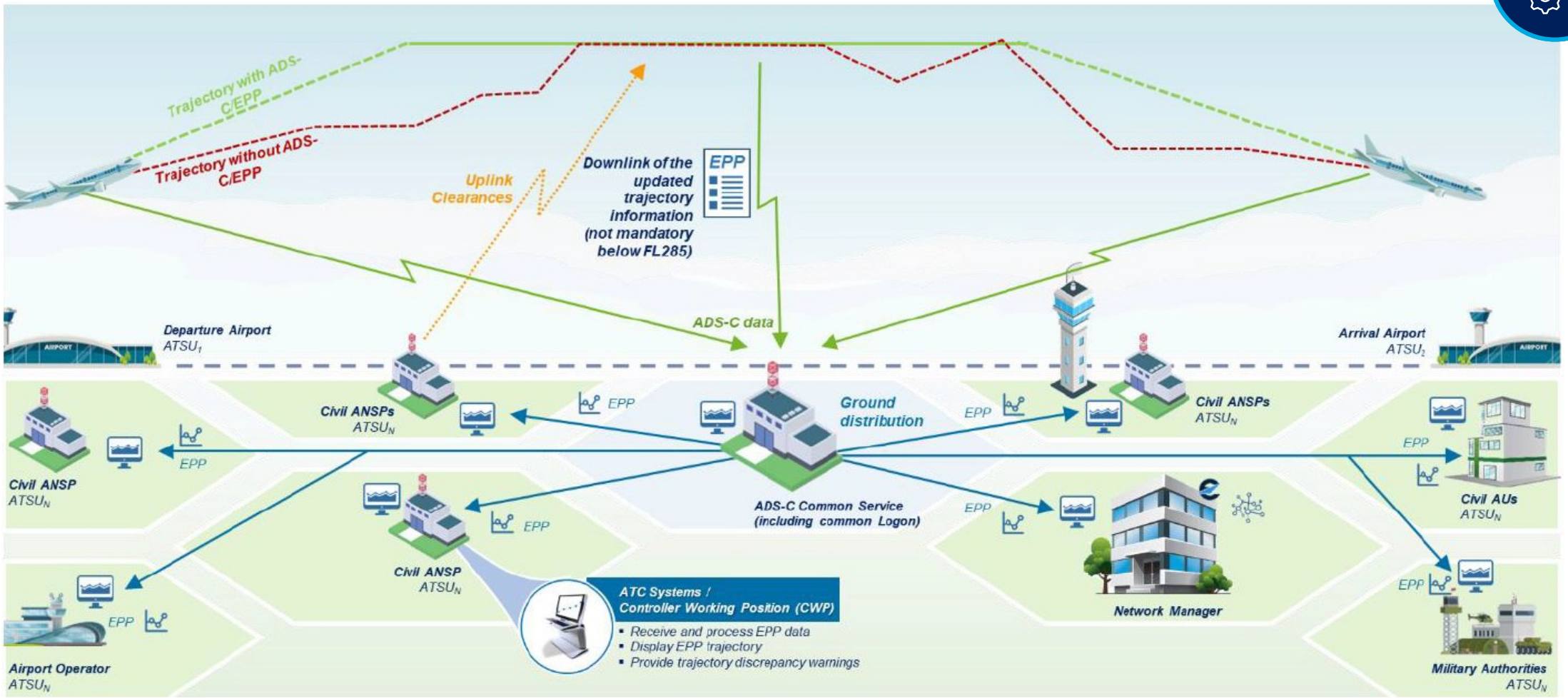
Real trajectory of the flight

TOD is displayed as string „TOD“

Benefits:

- ✓ It supports improved traffic awareness and more effective OPS planning, e.g.:
- ✓ The ATCOs know when the aircraft will start descending

TBO – future of ATM



Lessons learned

Admin. & Tech. challenges:

- Subcontracting costs to be a bit higher than planned => contracts signed after the IP submission
- Longer negotiation phase with the supplier => no delay caused since this was covered by the risks management
- B2B connection with NMOC ensuring proper validation/testing => ensuring availability of slots
- PENS capacity limits => not on the same level as communication via internet, issue mainly for FlightData service
- Other tech. challenges described and presented during „Flight Plan and Flight Data Evolution Sub-Group, ANSP Workshop“ on 9th Oct. 2025

Conclusion from ANS CR perspective:

- **Initial implementation of FF-ICE almost done (SWIM interface, MTOW, TOC/TOD presentation)** => to be CP1 compliant
- **Something completely new was/is being introduced** => brings a range of unforeseen technical challenges…
- **BIG THANKS to NMOC** => for brilliant cooperation within the integration of local system into the FF-ICE environment
- **SDM as great facilitator for managing EU funds for ATM stakeholders** => THANKS FOR THAT !!!

Thank you for your attention!

Any questions?