



# IMRBPB Meeting

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Oliver WEISS - Airbus Maintenance Programs Engineering

**AIRBUS**

# IP180 deployment on Airbus products

## The health predictive models

A predictive maintenance model is composed of:

- An algorithm with associated alerting logic
- A tailored interface for each model (HMI)
- Maintenance advice linked to ICAs
- A user guide

### Health Models

- Airbus develop **predictive maintenance** models and **diagnostic** models
- Three types of predictive models are being developed:
  - **Threshold based models**: when a certain threshold is reached alert triggers.
  - **Machine learning models**: the model learns from the evolution of patterns.
  - **Statistics based models**: use statistics to identify the root cause of an event.
- Each model may have one or numerous alerts
- Models are defined by health monitoring engineers. Data quality, data processing and models robustness are controlled and monitored continuously by Airbus.



# IP180 deployment on Airbus Aircraft

## Next Steps

1. We would like to leverage the use of New and Existing collaborative forums to review the AHM use cases for comments and adaptations;
  - (In existing forums) Use the planned **MWGs & ISCs** to provide feedback on action items and influence the AHM implementation & the roadmap.
  - (In new forums) Use the dedicated “**AHM - Focus Group**” with operators to leverage the operators experience and requirements in the early phase of the project.
2. We would like to use a two steps approach as following:
  - **Step-1: A trial phase** that consists of:
    - Selection of A320 and/or A350 use-cases to assess and validate the methodology and the related value,
    - Proposal of a PPH draft
    - Allowing level three application in MSG-3 analysis for the selected use cases,
    - Identify weaknesses and rooms of improvement during AHM-FG,
    - Reviews with operators and customers, MWGs, ISCs,
    - Reviews with the MRB/EASA
  - **Step-2: An implementation phase;**
    - Validating the PPH update with EASA & ISC,
    - Final validation of the AHM alternative/Hybrid by MWG & ISCs vs validated PPH,
    - Publish AHM inputs within the MRBR,
    - Validation of the MRBR including AHM,
  - Follow-up and update as necessary

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## Background - previous vs new candidates proposals (trial phase)

### **ATA-32: L/G Tire pressure monitoring:**

- Candidate to consider alternative means of compliance to the on-aircraft tire pressure checks every 48H (A350 example) with monitoring of tire pressures before every flight using the aircraft TPIS system,
- Considering the A350 MPD task: 324100-00M01-01; “Functional check of tire pressure” every 48 HR (with Note),

### **ATA-35: Crew oxygen servicing use case:**

- Candidate to consider alternative means of compliance to the preflight inspection check of the crew oxygen bottle.
- Considering that all safety and emergency devices are functional and operational before each flight (preflight checks and walkaround).
- Candidate Part-M subpart-C M.A.301 (continuing airworthiness tasks)

### **New potential candidates:**

- A320 21-26 - Skin Air Inlet Outlet Valve monitoring → A320 MPD 212600-01
- A320 28-29 - TMA fuel valve monitoring → A320 MPD 262200-06
- A320 28-42 - Fuel quantity probe monitoring → A320 MPD 313000-01-1
- A320 35-10 - Crew oxygen leak monitoring → A320 MPD 351000-10 and task covered by ZIP appendix 9
- A320 36-11 - Bleed temperature monitoring → A320 MPD 361143-01
- A320 49-16 - APU air intake flap actuator monitoring → A320 MPD 461600-02
- A320 49-70 - APU speed sensor → A320 MPD 313000-01-1

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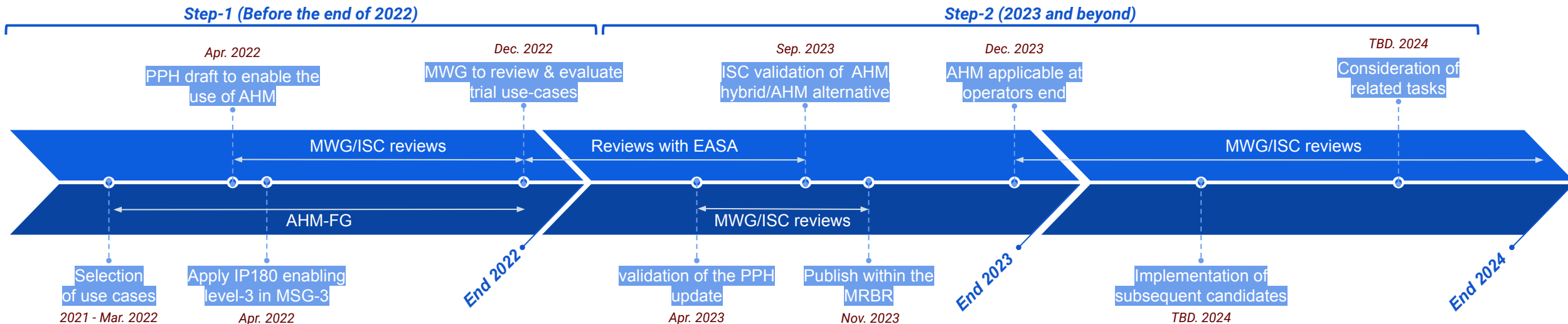
## What

1. By end of 2023 Airbus would like to enable the selection of:
  - a. AHM alternatives means of compliance to existing MPD tasks in the A320FAM or the A350 maintenance programs,
  - b. AHM hybrids paired with an existing scheduled maintenance tasks as a mean of compliance in the A320 and/or the A350 MP,
2. The use of the A320FAM & A350 programs is a preferred due to:
  - a. The abundance and availability of data in skywise,
  - b. The availability and the maturity of the health models,
3. The selection of the candidates for this trial is based on:
  - a. Availability of the models, the model maturity,
  - b. Maintenance tasks applicability (A/C configuration),
  - c. Leverage the use of the A320 PW1100-PIP → Enable Engine (ATA 7X) candidates,
4. Use cases candidates reviewed and proposed as candidates for Step-1 trial:
  - a. ATA-21, 24, 28, 35, 36, 49,
  - b. ATA-7X use-case list to be defined with Pratt & Whitney (A320 PW1100-PIP)

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When

- The Aircraft Health Monitoring - Focus Group (AHM-FG) is currently being set-up
- The planning shall be synchronized with the legacy A/C MRB planning (i.e. A320 and A350)



Thank you