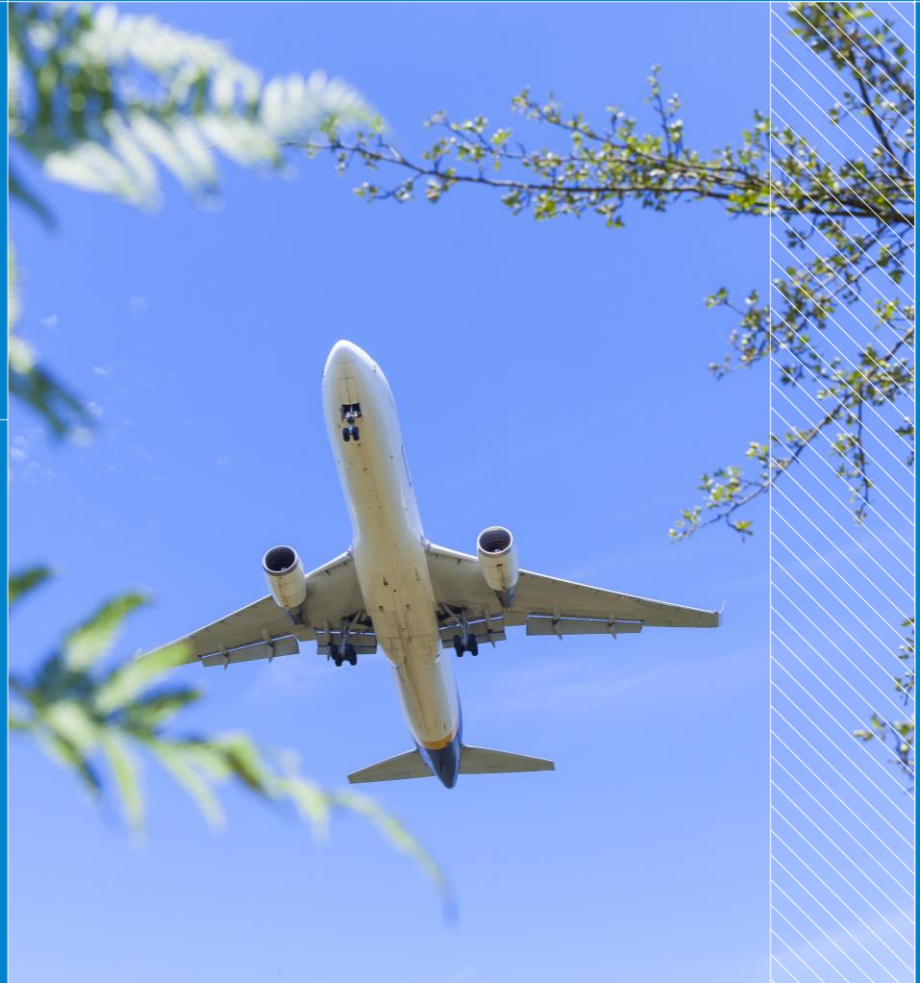


Task Force SW&AEH “Abstraction Layer”

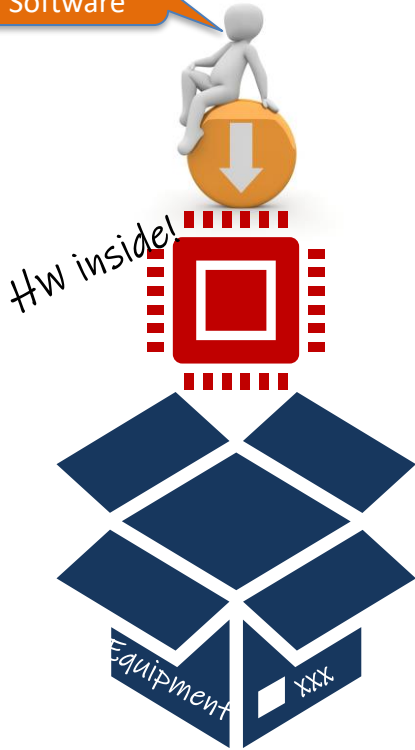
A joint EASA & FAA initiative in the
domains of Software (SW) and Airborne
Electronic Hardware (AEH)

Anne Sénéchal
EASA Senior Expert
Airborne Electronic
Hardware & Project
Certification Manager
ETSO



Introduction (1/2)

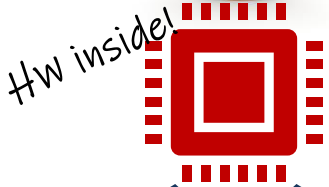
My name is
Software



- SW&AEH development assurance is needed to certify complex systems/equipment
 - To ensure it functions as intended
 - To ensure it doesn't adversely affect the proper functioning of other equipment
- MoC/Industry standards exist and are well recognized and widespread used in Aviation
 - AMC 20-115D and ED-12C/DO-178C for SW
 - AMC 20-152A and ED-80/DO-254 for AEH
- Different levels of assurance (DAL), commensurate with the failure conditions classifications
CAT/HAZ/MAJ/MIN/No Effect

Introduction (2/2)

My name is
Software

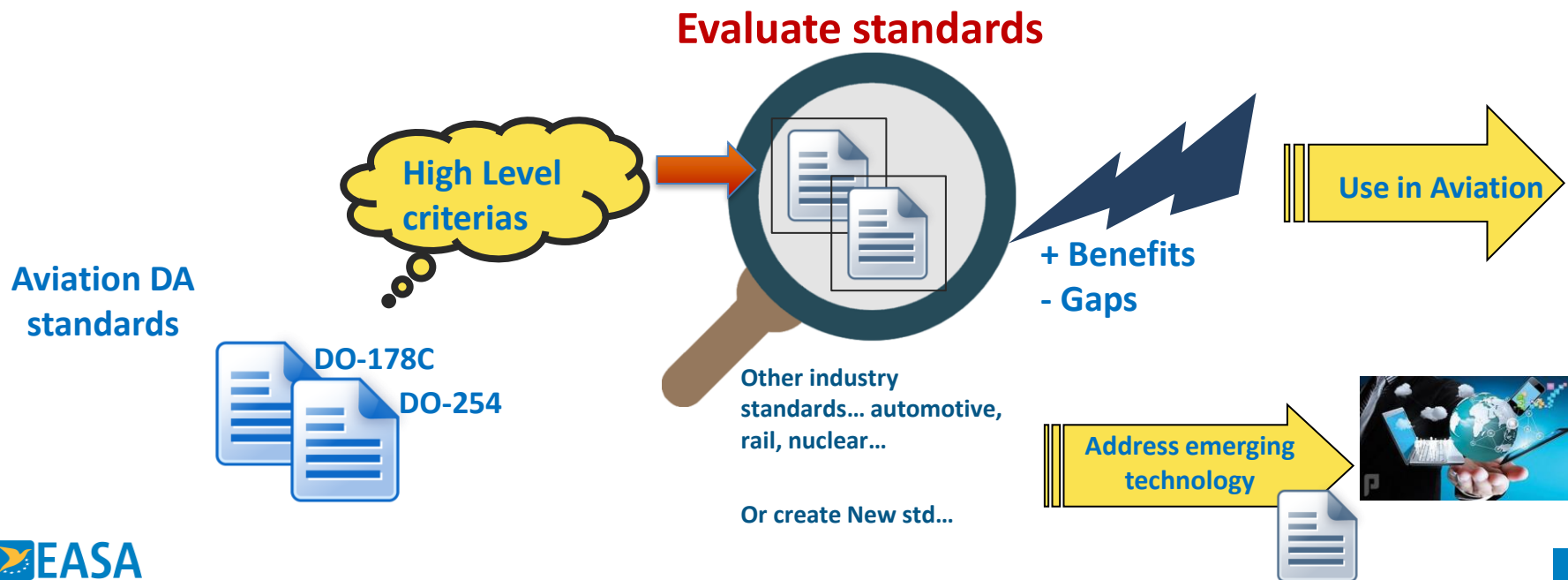


- MoC/Industry standards describe development processes and activities to be performed, modulated by the development assurance levels.
- What if a software or electronic hardware contains pieces of design developed within another market domain/different standards?
- What if novel technology calls for different process steps or breakdown of steps?

*Need to allow flexibility but continue ensuring safety !
→ Have a mechanism to evaluate alternate standards or methodologies*

Abstraction Layer – Purpose

→ Establish means to evaluate alternative Development Assurance standards



Task Force SW&AEH “Abstraction Layer”

- **ToR:** The SW&AEH Task Force has been set up as per the ToR signed by the EASA and FAA Senior Management in June 2019
- **Work Plan:** The group is following the revision 2 of the WP agreed in November 2019
- **The tasking:**
 - Task 1 (T1) - Develop criteria for evaluating a standard or methodology that could be used for the approval of Software and Airborne Electronic Hardware
 - Task 2 (T2) Identify standards or methodologies that could be evaluated (against the criteria defined in 1) as potential alternatives
 - Task 3 (T3) Highlight any recommendations to improve upon the concepts identified in DO-178 and DO-254

The Team

Co-chair:



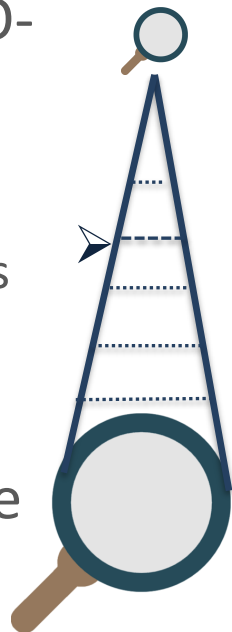
Participants



Develop criteria for evaluating alternate std...

Challenges

- Extract & abstract the fundamentals but detach from DO-178 & DO-254 activities!
- Find the right level of abstraction to
 - Accept alternate methods for development assurance processes
 - Be assertive to detect process gaps, potential process escapes / insufficiency for safety
- Cover development assurance for Software and Airborne Electronic Hardware simultaneously



Abstraction Layer Tasks summary

→ Task 1: 20 criteria developed.

→ Each criterion information is structured as follows:

→ Criterion

one goal

→ Purpose

the intent of a criterion to facilitate its understanding

→ Evaluation items

Key attributes of a development assurance process

→ Task 2: identified 3 standards or methodologies that could be evaluated.

- 1.ISO 26262 – Road Vehicles – Functional Safety (Automotive),
- 2.ASTM F3201-16 – Standard Practice for Ensuring Dependability of Software Used in Unmanned Aircraft Systems (UAS),
- 3.EN 50128 – Railway applications - Communication, signalling and processing systems - Software for railway control and protection systems....

→ Task 3: Table of recommendations to improve upon the concepts identified in DO-178 and DO-254, as captured along Task 1.

Abstraction Layer Tasks summary

- 3 recommendations issued for next steps
 - Recommendation 1: Allow trial of the use of Abstraction Layer criteria on the automotive standard ISO 26262.
 - Recommendation 2: Publish the Abstraction Layer and define the usage context of the Abstraction Layer.
 - Recommendation 3: Define a framework for recognition of alternate standards assessed using the Abstraction Layer, for use into Avionics certification projects.

Conclusion

- **Abstraction Layer developed by June 2021!**
- Next step will support a « proof of concept »
- Abstraction Layer is a means to assess alternate standards or methodologies, in an objective manner and help identify any gaps.
- Abstraction Layer doesn't replace industry standardisation in the SW&AEH domain.
- Recognized industry standards will still be needed to describe in details the methods to satisfy the Abstraction Layer objectives in order
 - to avoid subjective assessment on both side Aiworthiness Authorities and industry
 - to ensure level playing field
 - To be efficient in time & resources (avoid endless discussions)



THANK
YOU

