



PED fire on the flight deck IAW/CAW proposed way forward

E. Canari - Cabin Safety Expert

T. Manthey - Cabin Safety Expert

N. Duprez – STC Coordinator

PART 21 WORKSHOP

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PED fire on the flight deck

- Background
- Certification Review Items policy
- Way forward
- CARI 25-09: main findings
- Next steps

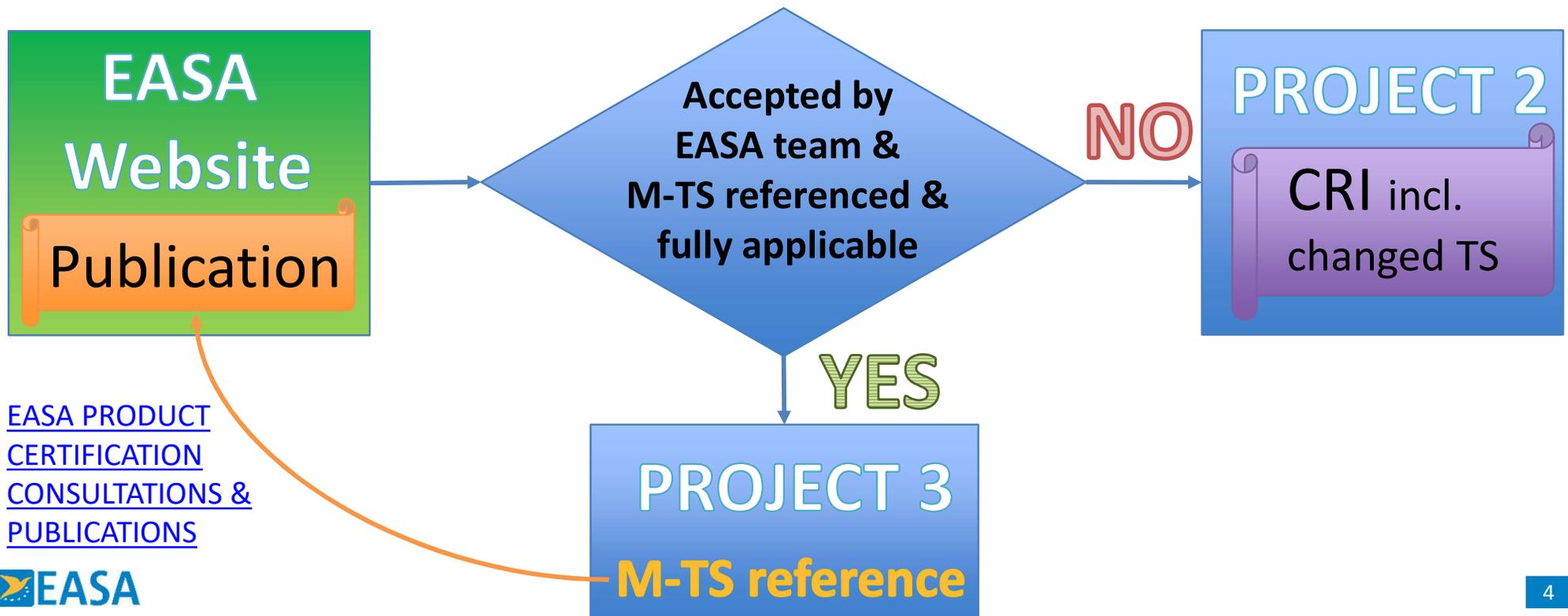


Background

- **Continuing Airworthiness (CAW) activities:**
 - In May 2018 EASA issued a Continuing Airworthiness Review Item (ref. CARI 25-09) to request TCHs to assess the hazard associated to a lithium battery fire on the flight deck
 - The CARI identifies a minimum set of measures necessary to address the hazard
- **Initial Airworthiness (IAW) activities:**
 - In December 2021 EASA published proposed special conditions to address the safety concern highlighted in the CARI for new design certification project
 - On 26 April 2022 EASA published the final Special Condition [M-TS-0000419](#) (Past Ref. SC-G25.1585-01) and the related CRD
- **SIB addressed to operators:**
 - On 12 October 2022 EASA published [SIB 2022-08](#) including recommendations based on the special conditions
 - The SIB was shared with other Aviation Authorities before publication

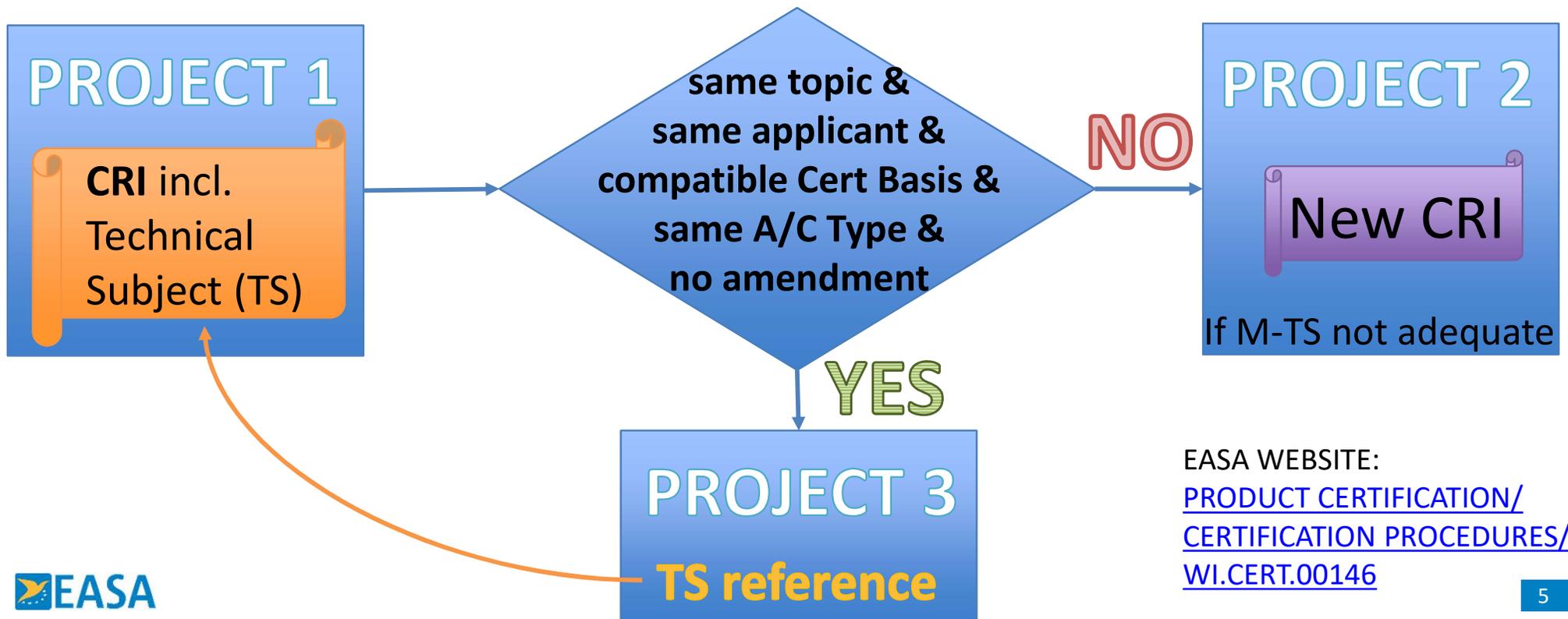
All IAW projects - New CRI policy

- GOAL: less administrative burden
- TOOL: using published Master Technical Subject (M-TS)



All IAW projects - New CRI policy

- GOAL: less administrative burden
- TOOL: using existing project Technical Subject (SC, ESF, IM, etc.)



PED fire on the flight deck - Way forward

- EASA will release a Certification Memorandum to communicate all the IAW and CAW activities performed since the release of CARI 25-09

- The CM should have the following minimum content:
 - Background for CARI 25-09
 - Definition of the intent of Special Condition [M-TS-0000419](#) (Past Ref. SC-G25.1585-01) and of the criteria for the applicability of the special condition to certification projects
 - Classification of design changes affecting the level of mitigation of flight deck fires originating from lithium batteries that are not part of the aircraft design
 - Specific guidance applicable to EFB mounts, addressing also already certified EFB mounts installations (ref. SIB 2022-08)

- Target for publication of the Proposed CM: **Q1 2025**

CARI 25-09 : main findings

- Unambiguous information on safe stowage locations available on the flight deck should be provided to operators (through placards and training material).
- Donning fire gloves is essential to safely handle PEDs:
 - Not always available on the flight deck or in its proximity
 - Minimum performance standard for fire gloves should be specified
- Use of fire containment bags not acceptable for fire fighting
- Fire Containment Bags may be used as PED stowage facilities, if adequate fire containment performance is demonstrated.

Fire containment bags

- FCBs may be used by TC holders as stowage means on the flight deck, if adequate performance is demonstrated.
- Fire containment should be demonstrated against a standard test method (e.g. UL5800).
- UL5800 needs improvement.
- Relocation of the fire containment bag to another compartment (e.g. a lavatory) is essential to address smoke released by the PED during the thermal runaway event
- Fire containment performance significantly depends on the strict application of the instructions for closure of the bag.

Next steps (1/2)

- Release of the CM on PED battery fire on the flight deck
- Update of SIB 2022-08 to include a reference to the new CM
- Update Certification Memorandum CM-21.A-CS-001 Issue 02 on "Classification of design changes to cabin interiors of Large Aeroplanes" to include an item dedicated to EFB mounts installation

Next steps (2/2)

- Make progress in the definition of a standard for FCBs addressing PEDs handling and battery fire containment: on-going EASA research project LOKI-PED
- Publication of the final report of the LOKI-PED research project (target Q3 2025)
- Revision of UL5800
- Definition of a minimum performance standards for fire gloves
- Identify any opportunity for safety promotion actions.

Thank you for your attention!

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Back-up slides

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Special Condition SC-G25.1585-01

Special Condition

Mitigation of flight deck fires originating from lithium batteries that are not part of the aircraft design

- 1) The emergency procedures to be followed in case of lithium battery fire on the flight deck must be specified considering the different threats (i.e. heat, smoke, fire and explosion) associated to a potential lithium battery thermal runaway event.
- 2) Adequate training must be specified for the flight- and cabin crew addressing such emergency procedures.
- 3) The emergency equipment required to effectively follow the procedures established to meet above SC 1) must be suitable for lithium battery fires and must be located either in the flight deck or in its close proximity so that it can be timely retrieved by the flight crew or the cabin crew, as applicable.
- 4) The design of each stowage compartment and each mounting bracket on the flight deck, must be evaluated by means of a fire hazard assessment supported by test evidence to determine its suitability to place or stow PEDs, power banks and spare batteries.
- 5) Placards must be installed to allow the identification of stowage locations and mounting brackets inside the flight deck that are determined to be suitable for PED stowage according to above SC 4).

Special Condition SC-G25.1585-01

MOC to SC 4

The hazard assessment required by SC 4) should cover all the consequences of a thermal runaway event, such as for example:

- a. Smoke and toxic gases released from the **battery**, taking into account the effects of the implementation of the applicable flight deck smoke evacuation procedure.
- b. The need to remove the **battery** from the flight deck, if applicable.
- c. The consequences of the use of liquids to cool the **battery** as part of the fire-fighting procedure.
- d. The impact of the battery fire on the physical integrity of stowage boxes or mounting brackets.
- e. The potential for corrosive leakage from the battery.

The hazard assessment should be performed considering a representative lithium battery fire in terms of heat, smoke and toxic gases generation. In absence of any other justification, it should be assumed that in a thermal runaway of a representative PED battery temperatures as high as 760° C could be reached and that the event could have a duration of at least 2 minutes. **The setup and procedure of any test conducted to support the demonstration of compliance with SC 4 should be agreed with EASA.** The proximity of critical systems (e.g. oxygen systems, wire bundles, other batteries, etc.) that could be affected by direct flame impingement or heat transfer should be taken into account. **Mounting brackets should be shown to withstand the PED overheat/ fire until the PED can be safely removed from the mounting bracket.**

A possible means of compliance with special condition 4) consists in prohibiting the carriage on the flight deck of lithium batteries that are not part of the aircraft type design and that have a capacity exceeding 2 Wh.

EASA SIB 2022-08

EASA published the referenced Special Condition SC-G25.1585-01 to ensure that the design of newly certified large aeroplanes can withstand the threat of a flight deck fire originating from a lithium battery that is not part of the aircraft design.

EASA has also started the process of reviewing the design of already certified large aeroplanes to determine, if any unsafe condition exists due to a PED fire.

At this time, the safety concern described in this SIB is not considered to be an unsafe condition that would warrant either an Airworthiness Directive (AD) action under Regulation (EU) [748/2012](#), Part 21.A.3B, or a Safety Directive (SD) action under Commission Regulation (EU) [965/2012](#), Annex II, ARO.GEN.135(c).

EASA SIB 2022-08

Recommendation(s):

EASA recommends the large aeroplane operators to:

- Ensure that no PEDs, spare batteries or power banks are transported on the flight deck, unless, when not in use, they can be placed or stowed in flight deck stowage compartments that have been specifically designated to stow PEDs, power banks and spare batteries by the relevant design approval holder.
- Implement Service Bulletins published by TC holders to address the lithium battery fire events on the flight deck.
- For EFBs, ensure that the battery fire scenario is addressed in the risk assessment performed to authorize their use on the flight deck. In such risk assessment no credit should be given to existing EASA approvals of mounting brackets installations, as regards to withstanding the effects of a lithium battery thermal runaway, unless there is the evidence that EASA Special Condition SC-G25.1585-01 was part of the certification basis considered for the related projects.