COMMENT RESPONSE DOCUMENT

EASA CRD of Special Conditions for the installation of a PED charging trolley
Applicable to Large Aeroplanes, with ATLAS galley installed
[Published on 16 January 2017 and officially closed for comments on 06 February 2017]

Commenter 1: Boeing Commercial Airplanes – Capt. Terry L. McVenes / Director, System Safety & Regulatory Affairs – 06 February 2017

Comment # 1 : Title of the Special Condition

Considering the following rationales :

1- ATLAS galley isn't a standard and has no standard meaning. For example, you could call the galley a KSSU galley or an ARINC 810 galley and the SC would not apply.
2- The title clearly states this is a SC for "trolleys ", but stations are used in the special conditions. It is assumed that "trolley" should be used throughout this SC for consistency as the title states. So the special conditions should say trolleys instead of stations for consistency.
3- It is important to clarify that the PEDs are provided by the airline and that only lithium battery powered PEDs are subject to this SC. The airline would be responsible for insuring the PEDs meet the limitations of the trolley. Also, PED should not be mentioned as a tablet computer without clarification on how to determine a tablet computer from a Laptop, a notebook computer, a smart phone, etc.
4- If small Li-batteries are intended to be exempt from this special condition, then battery size criteria should be included in the SC.
5- Lithium batteries can fail without being charged due to physical abuse, battery cell defects, PED wiring failures, or overheating. Therefore, the requirements should also apply to trolleys that are not also charging stations. As written, it could be interpreted to apply to only trolleys that were also charging stations.

Comment :

The following wording changes are proposed :

Special Conditions for the installation of a PED charging trolley
Applicable to Large Aeroplanes, with Atlas galley installed

should be changed into :

*Special Conditions for the installation of a PED ~~charging~~ **stowage** trolley **and/or stowage charging trolley -***
Applicable to Large Aeroplanes~~, with Atlas galley installed~~

EASA response: *partially agreed*

1. ***Partially agreed. ATLAS is the environment considered in the present proposed Special Conditions. However the reference to it can be transferred to the galley environment.***
2. ***Disagreed. "charging station" is the subsystem inside the trolley.***
3. ***Disagreed. The lithium batteries issue is mentioned already in the statement of issue. PED lithium batteries, whether Tablet or Notebooks or Smartphones are all presenting the same risks of thermal runaway. What is applicable to tablet computers in that case is applicable to Notebooks and Smartphone too.***
4. ***Disagreed. Small batteries do not power PED. No need to include a change with that respect.***
5. ***Agreed. Lithium batteries can fail without being charged due to physical abuse, battery cell defects, PED wiring failures, or overheating. Therefore, the requirements should also apply to trolleys that are not also charging stations. As written, it could be interpreted to apply to only trolleys that were also charging stations.***

The title of the Special Conditions will be changed as following:

Special Conditions for the installation of a PED stowage / charging trolley

Applicable to Large Aeroplanes~~, with Atlas galley installed~~.

Comment # 2 : Statement of Issue

For the same rationales as already mentioned through the comment #1

Comment :

The following wording changes are proposed :

The installation of a Personal Electronic Device (PED in this context are all battery powered tablet computer) stowage and charging Trolley into ATLAS galley installations of large aeroplanes is considered. This trolley installation will include special stowage compartments that are intended to recharge PED batteries when the PED is stowed inside.

should be changed into :

The ***special condition addresses the*** *installation of ~~a~~ Personal Electronic Device (PED ~~in this context are all battery powered tablet computer~~) stowage* ***trolleys*** *and****/or stowage/*** *charging* ***trolleys. PED in this context are all airline provided Personal Electronic Devices powered by lithium***

batteries. ~~*Trolley into ATLAS galley installations of large aeroplanes is considered.*~~ *This trolley installation will include special stowage compartments that are intended to* ***stow and/or*** *recharge PED batteries when the PED is stowed inside.*

EASA response: *partially agreed*

The text in the statement of issue will be changed as following:

The installation of a Personal Electronic Device (PED in this context are all battery powered tablet computer) stowage and charging Trolley into galley installations of large aeroplanes that are meeting the ATLAS standard is considered by the applicant. This trolley installation will include special stowage compartments that are intended to stow and / or recharge PED batteries when the PED is stowed inside.

Comment # 3 : Special Condition Item 1

The Special Condition Item #1 is deemed incomplete, and wording improvements are proposed to :

1. [provide] a requirement to allow detection by cabin crew and occupants to insure that smoke is not vented overboard, or directed to a hidden area.
2. [help] clarify the special condition to address the concern that other batteries could be ignited and result in a bigger and possibly uncontrolled fire.
3. [address] the concern that that the fire could propagate outside the trolley.

Comment :

The following wording changes are proposed :

1. *Each PED stowage/ charging station must be designed to prevent the propagation of a fire starting from a PED to adjacent compartments containing other PEDs*

should be changed into :

1. *Each PED stowage/ charging station must be designed to* ***allow detection in the aircraft cabin of a stowed PED smoke/fire event, and to*** *prevent the propagation of a* ***single PED*** *fire* ***from igniting or initiating battery thermal run-away in*** ~~*starting from a PED to adjacent compartments containing*~~ *other PEDs****, or fire propagation outside of the PED stowage/charging trolley.***

EASA response: EASA disagrees

The proposed new wording is not adding additional requirements or additional clarity. Special Condition 1 is complemented by Special Condition 2.

Comment # 4 : Special Condition Item 2

1. If the stowage is shown to contain a single PED event and not cause other PED batteries to fail (burn or vent), then detection is less of a concern. Lithium battery failures typically release a lot of smoke, so it is not likely to go unnoticed for very long, but the crew could be busy serving in the opposite end of the airplane and may take some time to respond and assess the situation. It is important to provide the crew time to react, otherwise the test article could be extinguished immediately upon smoke being observed, which would not be a representative test.

2. Please delete the verbiage: “it can create any hazard (smoke, toxic gases, explosions, etc.) to cabin occupants." The hazard of one PED failure/fire that does not ignite batteries in other PEDs or propagate outside the trolley is adequate risk mitigation. If the failure of one PED battery could create other unacceptable hazards such as smoke, toxic gases, explosions, etc. to cabin occupants, then PEDs would not be allowed as carry-on items on airplanes.

Comment :

The following wording changes are proposed :

2. *It must be demonstrated that a fire originating from a PED stowed in the PED stowage/charging station is detected and extinguished before it can propagate to other PEDs or it can create any hazard (smoke, toxic gases, explosions, etc.) to cabin occupants.*

should be changed into :

2. *It must be demonstrated that a fire originating from a PED stowed in the PED stowage* ***and/or stowage*** *charging* ***trolleys*** ~~*station*~~ *is* ***contained to the one PED, long enough to allow crew action, and does not*** ~~*detected and extinguished before it can*~~ *propagate* ***and involve another*** ~~*other*~~ ***PED’s batteries or propagate outside of the trolley.***~~*or it can create any hazard (smoke, toxic gases, explosions, etc.) to cabin occupants.*~~ ***It shall also be demonstrated that the PED can be safely accessed for firefighting (using portable fire extinguisher and/or water per EASA SIB 2009-22)***

EASA response: EASA disagrees

The Special Conditions where written in an effort to provide risk based requirements and not to focus on one specific design. If the design can contain the fire with no additional risk, active firefighting may not be necessary.

There is a fundamental difference to items that are installed on an aircraft by an aviation Design Organisation (OEM or an STC applicant) and items that are not (e.g. carryon items by passengers, non-aviation appliances provided by the airline). For the first ones the applicant has responsibility for any additional risk the change may introduce. For the second one the operational requirements and limitations (e.g. transportation of dangerous goods, etc.) are introduced.

Comment # 5 : Special Condition Item 3

It is important to identify the trolley with the PED battery size or the PED make and model.

Limitations or design capabilities of the trolley are validated by special condition 2, and are dependent upon what was tested. Changes in the PED battery size, or type could result in a more energetic release.

Comment :

The following wording changes are proposed :

3. *Each station must be limited to the maximum battery capacity or to the specific PED that will be allowed inside.*

should be changed into :

3. *Each ~~station~~* ***trolley*** *must be limited to the maximum battery capacity* ***of each PED*** *or to the specific PED that will be allowed inside****, as related/defined by (the test required by) SC #2.***

EASA response: EASA disagrees

As mentioned by the commenter a change of the PED or the battery "could result in a more energetic release". This is covered by the proposed wording of Special Condition 3. The proposed new wording is not adding clarification but is taking away the generic approach of the set of special conditions when it is limiting to trolley installations.

Comment # 6 : Special condition Item 4

We believe to be clear and avoid misunderstanding that the manual switch location needs further guidance.

Comment :

The following wording changes are proposed :

3. *A manual or automatic shutdown of the electrical power supply must be provided and usable in case of smoke or fire detection at the PED stowage / charging station.*

should be changed into :

4. *A manual or automatic shutdown of the electrical power supply must be provided and usable in case of smoke or fire detection at the PED stowage / charging* ***trolley*** ~~*station*~~*.* ***If a manual switch is provided, it shall be located near the trolley charging outlet but not so close that a trolley PED fire would hinder power shutdown.***

EASA response: EASA disagrees

The proposed wording is more prescriptive and will reduce design flexibility. For example if the PED stowage / charging station is located in a galley and connected to galley power, the existing galley power shut down switch could provide an acceptable design, even if this switch is not located near the PED stowage / charging station

Comment # 7 :

We suggest adding a new special condition requirement, based upon the idea that the design should not inherently cause a failure condition that we are trying to protect against. Charging at maximum stowage capacity of the trolley shall not damage the PEDs and cause overheating and subsequent battery thermal runaway of PEDs being charged.

Comment :

The following wording is proposed to be added :

5. ***Charging provisions shall be designed not to cause overheating and subsequent battery thermal runaway of items being charged during normal operation.***

EASA response: EASA disagrees.

The proposed wording is covered by the existing applicable design requirements of CS 25 e.g. 25.1301 and 25.1309.

Note 1: ***When writing an EASA response, the responder should express first whether EASA agrees, partially agrees, or disagrees with the submitted comment /change proposal and should explain the grounds of the response. [****e.g. "we disagree. Vibration trend monitoring is successful in detecting cracked HPT seals, /… / and is the most practical way to prevent an unsafe condition due to cracked HPT seals", or "we agree. We have amended the Final AD accordingly"****]. Unless EASA (partially) agrees with a comment, a statement should be added (for each comment) that 'No changes have been made to the Final AD in response to this comment'.***