



EASA

European Aviation Safety Agency

Product Certification and Design Organisation Approval Workshop

22nd – 23rd November 2017

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TE.GEN.00409-001



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Group 3 – Rotorcraft Community

Speaker: Henning Robberstad
23/Nov/2017

Airborne Technologies GmbH
Airbus Helicopters
Airlift AS
Boggi, S.r.L.
Faia S.r.l
Heli Austria GmbH
Helicopters Italia S.r.l
Heli-One Norway AS
Ingenieurbüro für Luftfahrt
Leonardo Helicopters
MAP Aircraft Part 21 AS
Pal-V International B.V.
Scandinavian Avionics Design ApS

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EPA Marking on parts manufactured by PART 145 Organization

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EPA Marking on parts manufactured by PART 145 Organization

- P145 maintenance organisations are allowed to manufacture/fabricate parts onto aircraft from approved data
- Marking of these parts cause debate;
 - Part 21 requires that: *"Each part or appliance shall be marked permanently and legibly...."*
 - Part 145 Competent Authority may approve procedures that does not require marking of certain parts
 - Marking of some parts is not always practical
- Regulation references:
 - 21.A.109, 21.A.118A, 21.A.451 «Obligations and EPA marking»;
 - 21.A.439 «Production of Repair Parts»;
 - 21.A.804 «Identification of parts and appliances»;
 - 145.A.42(c) «Acceptance of components».



EPA Marking on parts manufactured by PART 145 Organization

- Practical issues:
 - Marking methods vary; vibro peening, laser engraving, indelible ink, stamping, labelling etc.
 - Mechanical marking may create stress points
 - Ink and print may be removed by paint/sealing solvents (skin/stringer)
 - Some shapes and sizes are awkward to mark
 - OEM repair parts (w/ Form 1 and appropriate marking) have marking removed by installation preparations (degreasing solvents)
 - Aircraft maintenance records contain traceability to structural repairs through approved data including detailed instructions and locations



EPA Marking on parts manufactured by PART 145 Organization

- Items for discussion:
 - Is it up to the Part 21J Organisation as design approval holder to decide if part number marking is required or not? (21.A.804)
 - Can the Part 21J Organisation mandate p/n marking and the Part 145 Organisation's competent authority approve procedures to disregard this requirement?
 - Are there more suitable means of marking structural repair parts that is not removed by installation and does not alter the mechanical features of the part?
- Preliminary conclusion:
 - Part 21 shall deliver to PART 145 suitable instructions to mark each parts of the Change/Repair;
 - Marking is mandatory for PART 145 organization in order to successfully complete the installation of the Change/Repair.
 - Some alleviation is still allowed based on practicality (not as general procedures)



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Possible proportionality/risk based logic application for CS 27 (similar to current CS 23) on small 2 seat gyroplanes

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Possible proportionality/risk based logic application (similar to current CS 23) for CS 27 (small rotorcraft) and for small size rotorcraft like 2 seat gyroplanes

- PAL-V manufactures a roadworthy 2 seat gyroplane
- Applicable certification specifications for the product is CS 27
- PAL-V raised the request for objective/performance based requirements, proportionality to risk
- Acceptable safety level and existing standards (ASTM) would be assessed/interpreted and used related with the emergency conditions for gyroplanes





Possible proportionality/risk based logic application (similar to current CS 23) for CS 27 (small rotorcraft) and for small size rotorcraft like 2 seat gyroplanes

- In CS27.562 “Emergency landing dynamic conditions” is a too demanding requirement for a gyroplane based vehicle.
- PAL-V suggests to follow the same principle which was used to rewrite CS23 for the rotorcraft category and look at objective based requirements rather than prescriptive based and take also into account proportionality which is related to the number of passengers.
- The conclusion of the discussion was there was certainly support for the idea and that there is already a working group working on that for CS 27-29 (i.e. GAMA/ASD Part 27&29 Re-organization steering Committee) to follow the same roadmap as CS23 but that it would take a long before it would be elaborated.
- Currently there is alleviation through the use of CRIs, but this usually proves to be very time consuming and costly for new TCs.



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STC management: expectation of EASA, TCH and STCH

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STC management: expectation of EASA, TCH and STCH from each other, compatibility question and differences with foreign Authorities approach

Presentation Abstract and Discussion Summary

- We shared the mutual expectations of the different stakeholders like Authorities, TCH and STCH. Looking from different point of view, it is possible to recognize common expectations even if they are differently formalized by the different stakeholders.
- It has been underlined the differences between different Authorities in terms of rules and guidance material.
- EASA provided a set of rules and AMC/GM also referring to the STCH/TCH relationship, also in the TCCA system is mentioned that relation but no mention coming from FAA.
- Compatibilities/incompatibilities matter with other equipment/kit is well shared by the different stakeholders even if it is treated in a different way during compliance demonstration and for formalization of final results that needed to be shared with the operator.



STC management: expectation of EASA, TCH and STCH from each other, compatibility question and differences with foreign Authorities approach

Additional Notes coming from discussion

- TCH-STCH arrangement is used only in few cases and usually when the change has a relatively wide impact at A/C level
- Compatibilities/incompatibilities is mostly managed focusing attention on specific A/C configuration used for showing compliance. That configuration is described in the STC Installation Instruction or it is included a set of activities to check if the A/C configuration is compatible with STC



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Interpretation of AC27-1 and AC29-2 with focus on MG and HEMS interiors

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Interpretation of AC27-1 and AC29-2 with focus on MG and HEMS interiors

Presentation and Discussion Summary

- It is presented and shared between the group the current strategy and issue arising from the certification of HEMS interiors for Helicopters
- Some examples of these difficulties and inconsistencies are presented (e.g. Isolette Certification or Material Flammability)
- It is discussed the very ambiguous definition of Carry-on equipment
- It is underlined the major problem, that is the COTS equipments normally installed in HEMS interiors (Medical Equipments) are not consistent with XX.1301, XX.1307 and XX.1309 Requirements and their production is not according to Part 21
- It is underlined that is very difficult to find where end the aeronautical certification and where starts the medical equipment



Interpretation of AC27-1 and AC29-2 with focus on MG and HEMS interiors (cont'd)

CONCLUSIONS

- **DoA CERTIFIES NOW, FOR HEMS INTERIORS ONLY THE «PROVISION FOR» THE INSTALLATION OF THE MED EQUIPMENT, IN ACCORDANCE WITH EASA**
- **AS PER AC 27-1 AND AC 29-2, THERE ARE SUPPLEMENTAL REQUIREMENTS TO BE COMPLIED WITH THAT SOMETIME ARE INCONSISTENT WITH MAINTAINING THE MEDICAL QUALIFICATION OF THE EQUIPMENT**
- **THE APPLICANT ITSELF CHOOSE HOW FAR GO WITH THE MEDIAL EQUIPMENT QUALIFICATION AND WHAT INCLUDE IN THE STC TYPE DESIGN**
- **EASA IS TRYING TO WORK ON THE TOPIC, AS WHAT WAS DONE FOR «CS-25 VIP INTERIORS»**
- **THE QUALIFICATION OF THE COMPONENTS IS LEFT TO THE OPERATOR**



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Certification of Oxygen System in Helicopters

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Certification of Oxygen System in Helicopters

Presentation and Discussion summary

- Medical Oxygen Certification for Helicopter is a New Task, Covered only by a CRI
- The Certification of the Medical Oxygen System is aimed to reduce the safety risks for the helicopters
- Is quite complicated, at this stage. to assure compliance both with EASA and EU Medical standards for Oxygen System
- The Tests required as CRI, including the Transient Pressure Level Tests, are discussed on a Case by Case evidence without further certification guidance for EASA



CONCLUSIONS

- **EASA IS PREPARING A COMPARISON DOCUMENT BETWEEN DO-160G AND INDUSTRIAL ENVIRONMENTAL REQUIREMENTS**
- **THE CRI SHOULD BE ADEQUATELY DIFFUSED**
- **THE EASA QUALIFICATION STOPS AT A «NO HAZARD TO HELICOPTER» LEVEL WITHOUT FURTHER ASSESSMENT**
- **IT IS POSSIBLE AND ACCEPTABLE, ONCE DEMONSTRATED WITH PROPER LISTS, TO USE MEDICAL STANDARDS TO DEMONSTRATE EASA REQUIREMENTS IF A PROPER REFERENCE WITH THE CRI REQUIREMENTS IS PROVIDED.**



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RNP Flight Test Procedures on Rotorcraft

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RNP Flight Test Procedures on Rotorcraft

- **Different Terms used**
- **Guidance Material available**
- **Field of view subject**
- **Amount on System Testing**



RNP Flight Test Procedures on Rotorcraft

➤ Different Terms used

Regulation 965/2012 identifies 4 RNP APCHs:

- **LNAV**
- **LNAV/VNAV**
- **LPV**
- **LP**



RNP Flight Test Procedures on Rotorcraft

LNAV +V?

vertical guidance - advisory or certified?

APV BARO-VNAV ?

Problem confirmed – no solution



RNP Flight Test Procedures on Rotorcraft

GUIDANCE MATERIAL AVAILABLE / APPLICABLE

AC 27 – 1B, MG1

AC 20-138D

AC 91-010

AC 90-105

AMC 20-27A

AMC 20-28

CM-AS-002

ICAO 9613

ICAO 9905

ICAO 9997

ICAO 8168

Problem confirmed – solution pending



RNP Flight Test Procedures on Rotorcraft

Field of view subject:

AMC 20-27A – normal field of view

PFV / SFV in #.1321

Problem identified – clarification intended



RNP Flight Test Procedures on Rotorcraft

Amount of Flight Test Required often underestimated.

Problem confirmed by EASA – early involvement of flight test team needed



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