



EUROPEAN AVIATION SAFETY AGENCY
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE
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Powerplant Fire Testing – Status

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IASFPWG – Köln - 22-23 May 2013

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➤ Background

- CEAT / DGA presentation International Aircraft Material Fire Test Working Group – Atlantic City – Oct08
 - Difference in burner severity
- ISO 2685:1998 Systematic Review - Meeting 13 Nov 2008
 - ISO « cleaning »
 - Burner severity from CEAT/DGA presentation
- Submission of ISO2685 revision scope by BNAé to TC20 ISO committee – Oct 2009

➤ Background (Cont'd)

- ISO2685 group work authorization – Nov. 2009
 - Kick-off : 26 May 2010
 - Further meeting : 14 sep 2010, 14 dec 2010
 - Some testing during the meantime revealed result discrepancies; potential interaction with NextGen activity; AC 20-135 revision
 - Idea to initiate a fire testing survey
 - ISO activity put in standby since then
- FAA-TC Next Gen for powerplant application – in 2010

➤ Background (Cont'd)

- FAA-TC/EASA/FAA fire testing Survey launch – 27 jul 2011
- FAA-TC/EASA/FAA survey results:
 - IASFPWG_2011_11_16-17_Atlantic city
 - IASFPWG_2012_05_23-24_Cologne
 - IASFPWG_2012_11_15-16_Long Beach
 - Many differences between labs
 - Good repeatability (test results) / Bad reproducibility (between labs)
 - Failure times usually higher for gas burner
 - Difference is affected by specimen size / shape effect / burner orientation effect



Powerplant Fire Testing Status

- Background (Cont'd)
 - FAA-TC/FAA launch for AC 20-135 revision working group – 7th May 2013

➤ Way forward

- Need to address the variability due to apparatus and associated methods (use, calibration,...);
 - One burner, one way of using it, minimize rigging adjustment possibility, parts replacement possibility,.....
- Fire testing severity representative of the engine fuel fed fire severity

➤ Way forward

- Plus some recurring interpretation issue;
 - Representative environmental conditions (i.e vibrations, loads, operating conditions,...)
 - Multiple fire testing referentials with differences (Powerplant No3, FAA Fire Test Handbook ch 11-12-13.., ISO2685, SAE, BSI, DO160, MIL, Electrical harness standards,...);
 - Focus on function to be performed under fire
 - Minimum aluminium thickness to be declared fire resistant per material definition : any data?
 - Details the materials properties acceptance for compliance and details the restrictions (i.e. Mg, Ti, Composite, Elastomer,...)

➤ Way forward

- Pass/fail criteria for residual flame : what is acceptable / not acceptable to be detailed.
- Flame orientation: on the most critical area. May require multiple fire test to assess the critical areas in case a (single) most critical area cannot be determined.
- Specimen engulfing by flame : may require multiple burner in case the specimen is not sufficiently engulfed.
- Combustor burnthrough: EASA generic CRI.
- Reinforce requirement for applicant to provide rationales for specimen vs final design to be certified representativeness
- Reinforce requirement for applicant to provide rationales for testing conditions vs final environmental / loads / operational conditions to be certified.
- And so on...

➤ Way forward

➤ ISO2685:

- Not the most adequate support to capture ALL on-going certification issues, especially dealing with interpretations, need for EASA Interpretative Material.
- Shall be revised to take into account some issues as identified during the survey to « reduce » variability.

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➤ Way forward

SHORT TERM

MEDIUM TERM

LONG TERM

 CRI

CM ?

ISO 2685 Rev. ?

AMC ?

ISO 2685 Rev.?
(NextGen Burner)

or

AC 20-135 Rev.?

 FAA Fire Test Handbook ?
(NextGen Burner)

Thank You

Questions ?