Engine Nacelle Halon Replacement

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By: Mr. David Blake for
Douglas Ingerson, Engineer
Federal Aviation Administration
WJ Hughes Technical Center
Fire Safety Team
Atlantic City Int'l Airport, NJ USA
tel: 609-485-4945
email: Douglas.A.Ingerson@faa.gov

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Presentation Overview

• Revise the Minimum Performance Standard for Engine Nacelles and APU Compartments (MPSe)
  – Currently known as revision 3
  – Will remove Halon 1301 fire test requirement
  – With Halon 1301 removal, revision 4 results
MPSe, Revision 3

- Fire testing required for Halon 1301 and replacement candidate

- Successful quantity of replacement candidate:
  - is established by fire test
  - demonstrates parity with Halon 1301 fire test results
  - is likely found by iterative process

- Equivalent concentration established from the distribution of the successful replacement candidate
MPSe Revision 3 – Schematic flow

FIRE TEST WITH HALON 1301

Repeated 4 times; 4 conditions of 2 ventilation regimes & 2 fire threats

ESTABLISH EQUIVALENT CONCENTRATION

FIRE TEST WITH REPLACEMENT CANDIDATE

COMPARE HALON 1301 & CANDIDATE BEHAVIORS

IF UNFAVORABLE

QUANTIFY DISTRIBUTION BEHAVIOR OF THE SUCCESSFUL CANDIDATE

IF FAVORABLE
MPSe, Revision 4 – Preliminary Thoughts

• Remove fire testing required for Halon 1301
  – utilize a surrogate for Halon 1301
  – maintain relation to historical Halon 1301 results

• Optimize process based on past experiences with HFC-125, CF₃I, & FK-5-1-12
MPSe, Revision 4 – Preliminary Thoughts

• Suspected equivalent concentration:
  – must be known by representative prior to MPSe testing
  – must be distributed in the test fixture prior to MPSe testing

• Successful quantity of replacement candidate:
  – will remain proven by fire test for the 4 conditions
  – if suspected equivalent concentration fails, will be found by iterative process of rev03
MPSe Revision 4 – Preliminary schematic flow

FIRE TEST WITH SURROGATE → FIRE TEST WITH REPLACEMENT CANDIDATE → COMPARE SURROGATE & CANDIDATE BEHAVIORS

ESTABLISH EQUIVALENT CONCENTRATION

QUANTIFY DISTRIBUTION BEHAVIOR OF THE SUCCESSFUL CANDIDATE

IF UNFAVORABLE

IF FAVORABLE

SUCCESS ESTABLISHED

IF FAVORABLE

IF FAVORABLE

IF UNFAVORABLE