Cargo compartment smoke detector

AS8036 standard revision

Ken Bell
Introduction

The Society of Automotive Engineers, after a request from the FAA, has undertaken to update AS8036 to include standard testing for false alarm resistance for smoke detectors.

The SAE working group was formed in May 2011 to develop the minimum performance standard for inclusion in AS8036.

This presentation will update the System group on the progress of the project.
FAA request to update AS8036

- December 10, 2003 FAA requested that SAE review AS8036 modify it to address the effects of sudden cabin pressure increase on smoke detectors

- TSO C1d was updated in August 2004 to address the effects of sudden cabin pressure increase but AS8036 has not been updated since 1985

- March 31, 2011 FAA requested that SAE task a committee to develop an improved test standard for AS8036, which addresses the effects of dust, dirt and moisture on false alarms from smoke detectors

- After AS8036 is updated, the FAA intend to update TSO C1 to use the updated AS8036 as a reference
False alarms by year

Data from Boeing databases, NASA ASRS and FAA SDR
False alarms by suspected cause

Data from Boeing databases, NASA ASRS and FAA SDR
False alarms by phase

Data from Boeing databases, NASA ASRS and FAA SDR
AS8036 team

- David Alexander, SAE
- Keely Andrews, SAE;
- Ken Bell, Kidde
- Dave Blake, FAA Tech Center
- Ian Campbell, Meggitt
- Laura Feix, SAE
- Andre Freiling, Airbus
- Stephen Happenny, FAA
- Joan Hughson, FAA
- Larry Lamberth, Honeywell
- Bruce Mahone, SAE
- Bruce Miller, Boeing
- Gerd Wedler, AOA-Gauteng
Current and future state of AS8036 and TSO-C1

Current revision of AS8036 and TSO C1
• Hasn’t been updated since 1985
• Calls out DO-160B
• Does not specify any testing for false alarm resistance
• TSO C1d references AS8036 DO-160D
• TSO C1d asks for extra testing to address effect of sudden cabin pressure increase

Future revision of AS8036 and TSO C1
• 2012 revision
• Will call out latest revision of DO-160 (currently Rev G)
• Will specify testing for false alarm resistance
• Will specify testing for sudden cabin pressure increase
• TSO C1e will reference AS8036, which will specify all required minimum performance standard testing
Where we are in the AS8036 update project

- Shortlist of testing

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Test procedure</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Fog Test</td>
<td>Condensed water mist presented to the detector</td>
<td>Reproducibility can be difficult</td>
</tr>
<tr>
<td>ISO12103-1 Ultra Fine</td>
<td>Detector exposed to dust suspended in air</td>
<td></td>
</tr>
<tr>
<td>Insecticide</td>
<td>Detector exposed to sprayed insecticide aerosol</td>
<td>Alternate to Callington preferred (hazardous material)</td>
</tr>
<tr>
<td>Ambient Light Exposure</td>
<td>Bright light shone at detector</td>
<td>Method similar to EN54</td>
</tr>
</tbody>
</table>
Next steps

We have determined the tests that will enable an effective update of AS8036 to test false alarm resistance of smoke detectors.

• We now need to determine the test methods with respect to concentration and presentation of false alarm sources

• We also need to define the success criteria for the tests. Possibilities include a rejection ratio or pass/fail criteria when exposed in a certain way

• There is a AS8036 working group immediately after this meeting to resolve these questions

AS8036 and updated TSO should result in better detectors and more safety
Schedule to complete

• Completion of test identification and definition - November 30, 2011

• Update AS8036 to include new testing and latest DO-160 references - January 31, 2012

• Complete review of updated document and submission to SAE for publication - March 16, 2012