Difficult Areas For Burnthrough Implementation
Objective

- Include methods of compliance in the AC for all configurations in airplanes.
  - Same safety standard worldwide
  - Same safety standard from all airframe manufacturers
  - Address certification issues early on
Overview

- Testing Issues
- Unique Configurations
- Summary
The Advisory Circular gives detailed instructions for testing burnthrough designs when blankets are installed between and over frames. Depending on the airplane 20% to 80% of insulation cannot match configurations currently in the AC.

Minimal direction is given for unique configurations that cannot be attached as stated in the AC currently.

Many configurations do not fit the test apparatus.
Unique Configurations

- There is not an identified method to certify unique designs to the flame penetration test

- Attachments in some areas are unable to meet burnthrough requirements

- Examples
  - Upper cheek – Main deck floor beam and frame intersection
  - Main Deck Entry Doors and Hatches
  - Blankets Surrounding Main Deck Entry Doors
  - Lower Lobe Cargo Doors
  - AOE doors and linings
  - Airstair door
  - Aft Pressure Bulkhead
  - Nose Bulkhead
  - Cargo Bulkhead
  - Nose wheel well bulkhead/Bilge
  - Over-frame support beams
  - Sloping sidewalls
  - Bilge
  - EE Bay Hatch and walkway
Unique Configurations

- Upper cheek – Main deck floor beam and frame intersection

- Situation:
  - Not able to clamp over frames due to floor beams
  - No other attachment method known that meets rule
  - No method for testing
Unique Configurations

- **Main Deck Entry Doors and Hatches**
- **Situation:**
  - Contain blankets that are installed into pockets, retained with bond-on pins or hook and loop
  - No overlap possible – must maintain door functionality.
  - Cannot add holes for screw through pins
- Allow burnthrough materials with best design solution – no testing required
Unique Configurations

- **Blankets Surrounding Main Deck Entry Doors**
- **Situation:**
  - Unique structure around doorways does not allow for use of screw-through pins or clamps
  - Blankets are attached to structure with hook and loop
  - Overlap of blankets is not possible – must maintain door functionality.
Unique Configurations

- **Lower Lobe Cargo Door**

- **Situation:**
  - Foam is attached to outboard side of cargo liner with adhesive.
  - Insulation attached to door with hook & loop
  - No method for testing
Unique Configurations

- **Automatic Over-wing Exit (AOE) doors and linings**

- **Situation:**
  - Unique structure around doorways does not allow for use of screw-through pins or clamps
  - Blankets installed on liner with double back tape.
Unique Configurations

- **Airstair Door**
- **Situation:**
  - Unique structure around doorways does not allow for use of screw-through pins or clamps
  - Foam pad glued to aluminum skin (shown left of door) and is attached to inboard surface of door using velcro.
Unique Configurations

- Aft Pressure Bulkhead
- Situation:
  - No frames to attach to
  - Stringers will burn away in less than 4 minutes leaving no method of attachment
  - No method for testing
Unique Configurations

- Nose Bulkhead
- Situation:
  - Blankets are attached using hook and loop or bond on attachments
  - Not able to use clamps around perimeter locations
Unique Configurations

- Nose Bulkhead
Unique Configurations

- Cargo Bulkhead
- **Situation:**
  - Blankets are attached using hook and loop or bond on attachments
  - Not able to use clamps around perimeter locations
Unique Configurations

- Nose wheel well bulkhead/Bilge
- Situation:
  - Unique structure does not allow for use of screw-through pins or clamps
  - No testing method known
Unique Configurations

- Over-frame support beams
- Situation:
  - Certification is undefined due to slits needed to overlap frame.
Unique Configurations

- Sloping sidewall
- Situation:
  - Blankets do not overlap frame because of cargo liner attachment
- Allow cargo liner as part of the burnthrough configuration
Unique Configurations

- **Bilge**
- **Situation:**
  - Blankets do not overlap frame
  - Airplane geometry requires splice at frame - skin intersection
  - Bilge frame up to 2’ deep
  - No method for testing
Unique Configurations

- **EE Bay Hatch and walkway**
- **Situation:**
  - Unique structure around hatches does not allow for use of screw-through pins or clamps
  - Foam bonded or attached with velcro to interior surface of EE bay hatch and walkway
Unique Configurations

- **Nose Wheel Well**
- **Situation:**
  - No method of testing large blankets in test rig
  - No method of testing box corners
  - No attachment method known for this geometry
Summary

- Many areas of the airplane have blanket configurations that are not depicted in the proposed scenarios of AC 25.856-2X.
- Many airframe designs are not depicted in the proposed AC. Methods of testing these designs and attachments are not well defined.
- Certification method for areas not depicted in the AC is not well defined.