

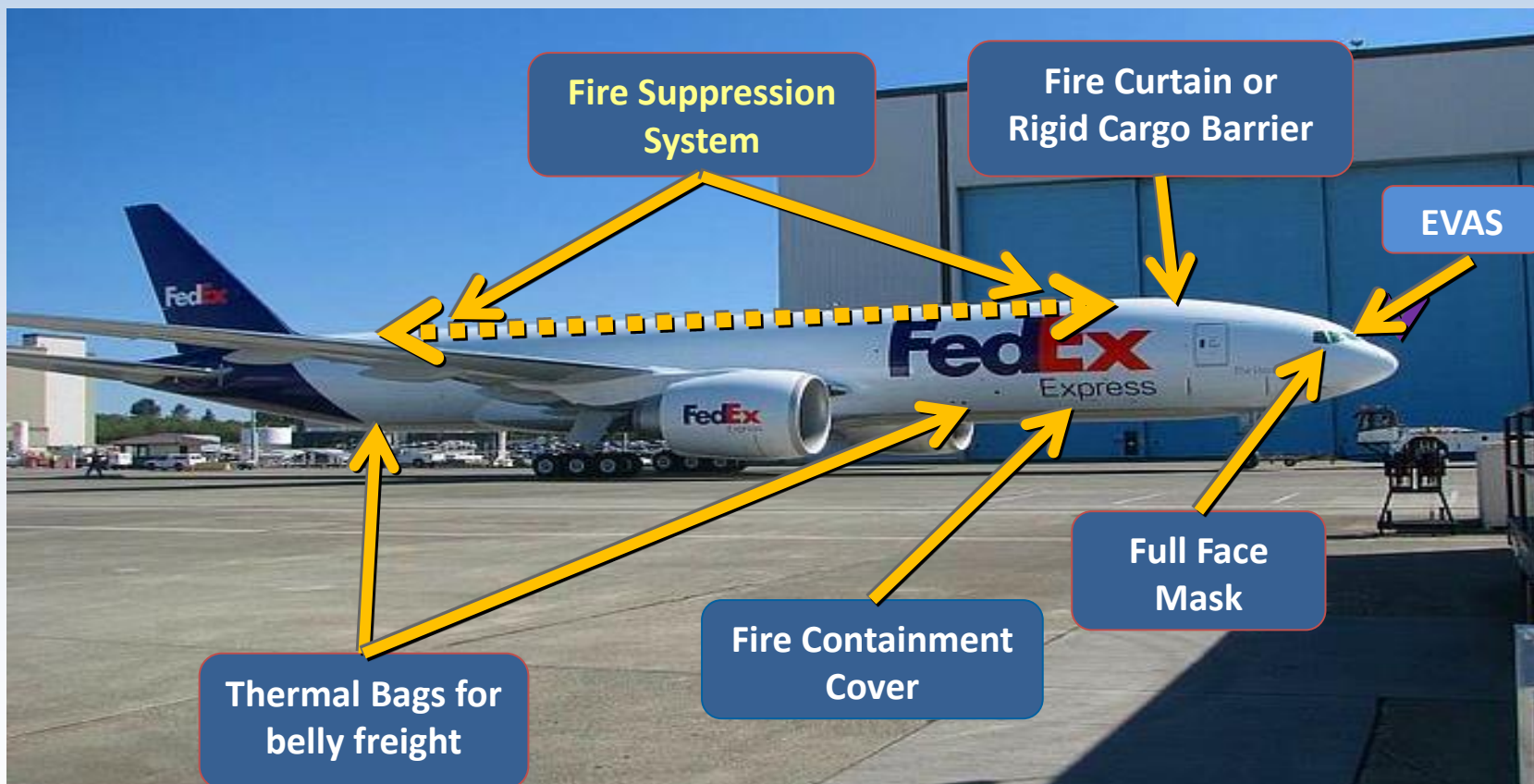
Safety Technology

(Swiss cheese slices for fire suppression)



Captain Rich Hughey, FedEx Express
Chairman, ALPA President's Committee for Cargo

Layered Safety Technology (for fire suppression)



FY14 Improvements & Updates

Layered Safety Technology (for fire suppression)

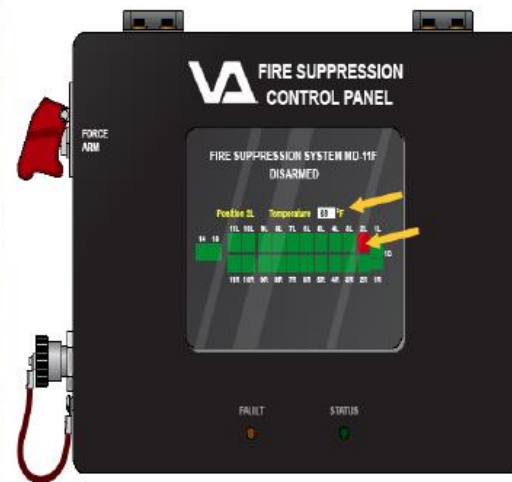
Container Mod



Pallet Bag Pic



FSS Video



- All containers modified with fireproof curtain and clam shell locks
- Fire Containment Covers (aka Pallet Bags)
- Fire Suppression System installed in all MD11s and 777s



Fire Suppression System

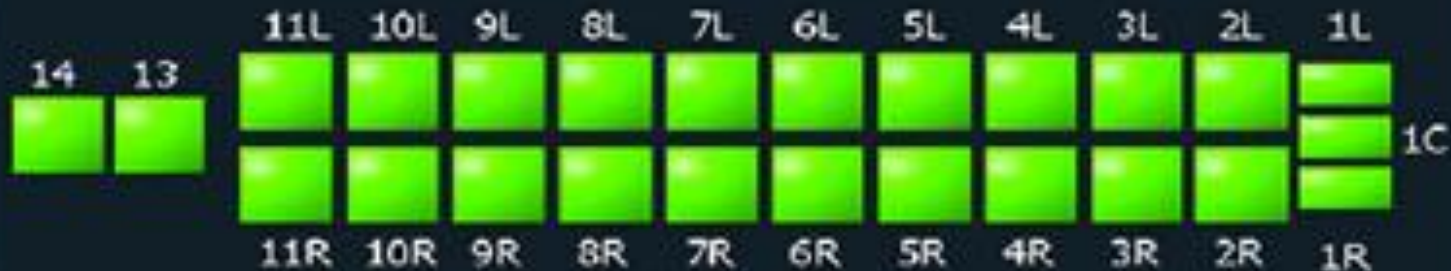


Think of Skycam at Football Games

Fire Suppression System

Fire Suppression System MD-11F DISARMED

L1 Door →



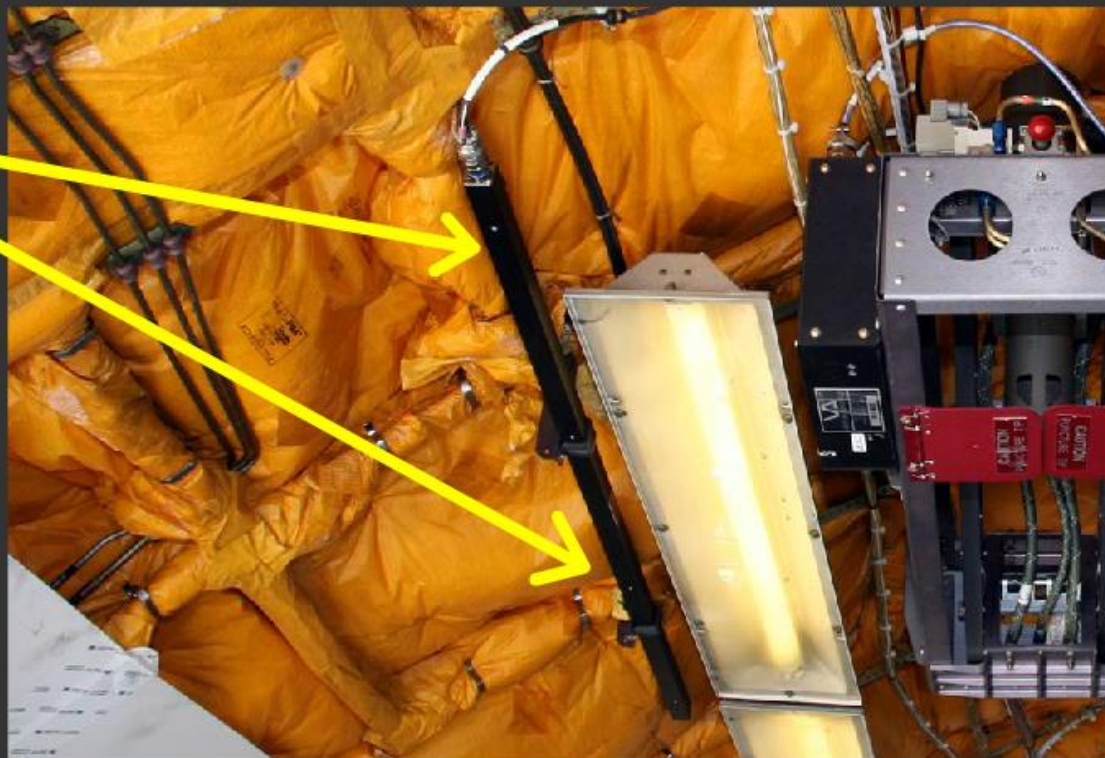
Think of Skycam at Football Games

Main Deck Fire Suppression System



FSS Thermal Sensors (over each position)

Thermal Sensors



FSS Argon & Surfactant Storage



FSS Penetrator-Actuator



Outside of Container
Before Actuator Penetration



Inside of Container
After Actuator Penetration



Future Safety Technology



Lithium Battery Thermal Runaway = Risk

More Batteries Packaged Together = Greater Risk



Future Performance-Based Packaging

Proprietary Gel/Liquid coolant



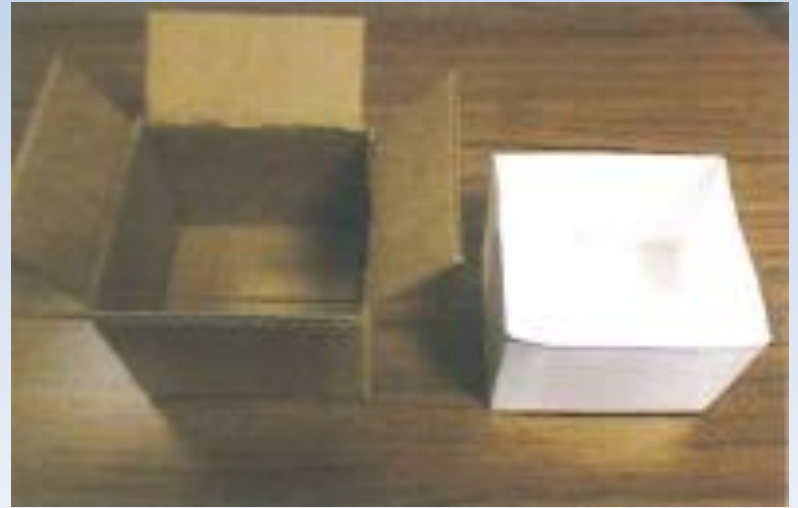
- Re-useable
- Plastic shell releases at a pre-determined temperature
- Gel absorbs heat from thermal discharge/fire
- Keeps adjacent cells/batteries cool
- Smothers/suppresses heat/fire



Future Performance-Based Packaging

The gel/liquid coolant has a tendency to soak into any absorbent material, i.e., cardboard. Therefore the batteries have been placed in a coated tray in order to retain the fluid.

Gel pack acts as a buffer between the top of the box and the cells/batteries.



Future Performance-Based Mask



Not Ironman's mask...



Future Performance-Based Mask

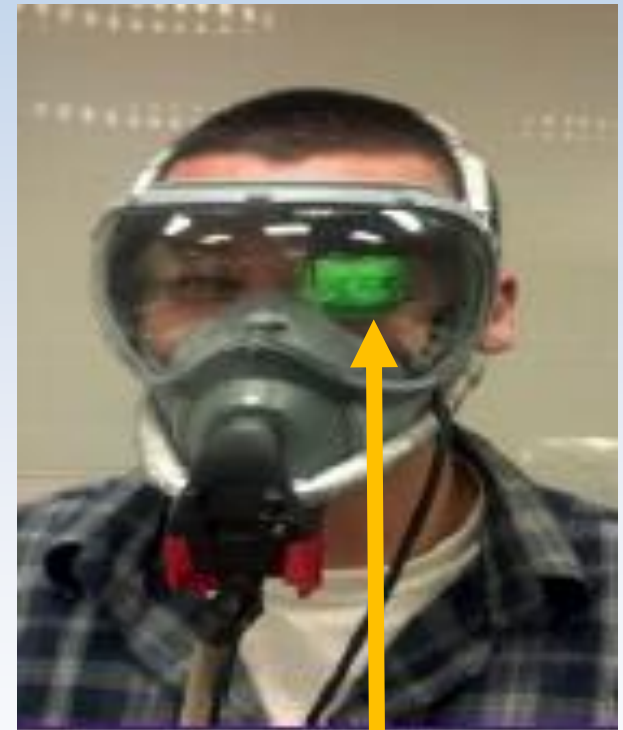


Not an F-35 mask...



Future Performance-Based Mask

Current Full Face O₂



Integrated HUD display
replicated in the eye piece within the mask



Pilot Perspective

- Fire is a severe safety risk on an aircraft
- Fire/heat sources don't have the same properties
- No silver bullets
- Technology solutions need to be layered
- Operators are leading with solutions



Pilot Perspective

- Time is a critical element to success
- Risk needs to be fully understood
- Accelerate battery testing
- Control this DG
 - Is it specifically identified?
 - How much is there?
 - How is it packaged?
 - Where/how is it loaded?
- **BOTH** Passenger AND cargo

One Level of Safety

