

# Alternative Methods for Approval: Case Study on Child Restraints

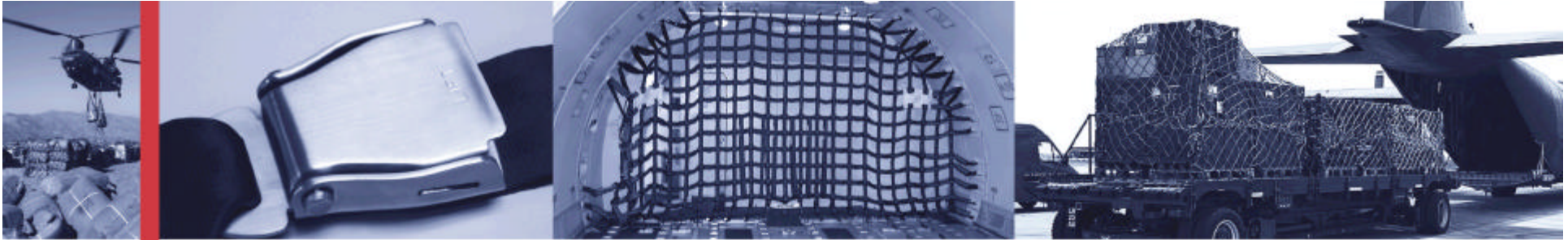
## US/Europe International Aviation Safety Conference

June 6-8, 2006

Portland, OR, USA

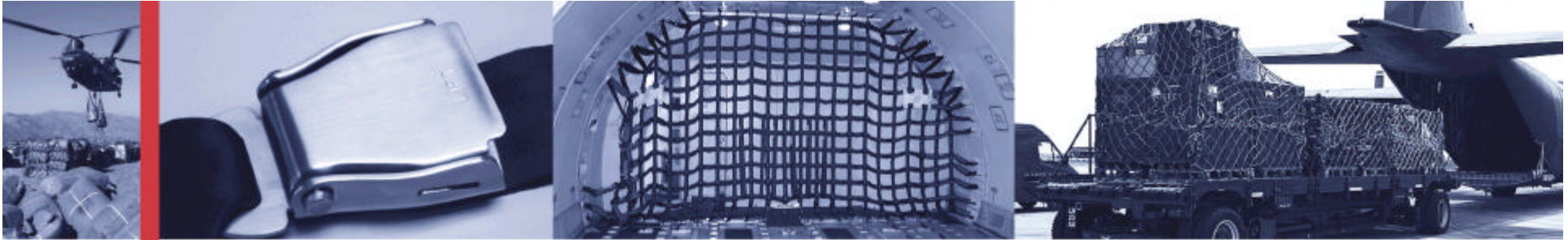
Joseph J. Regulski  
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**AMSAFE**  
*AmSafe, Inc.*



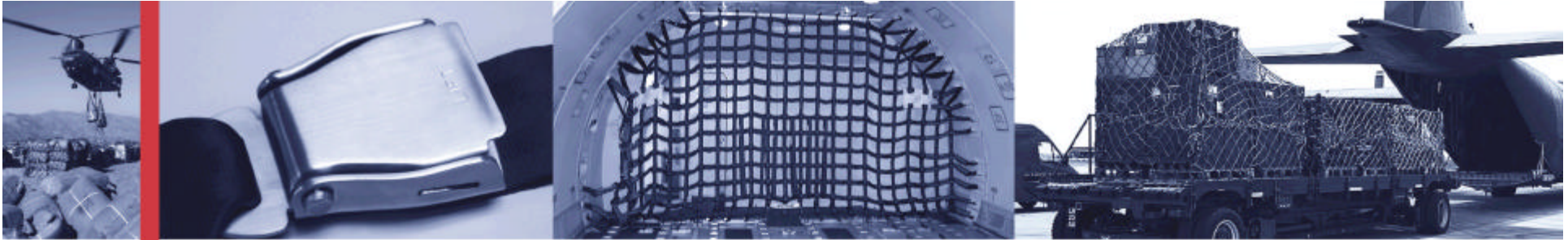
## The FAA recommends:

- **Children under 20 lb. (9.1 kg.) should be restrained in an approved rear facing CRS (Child Restraint System)**
- **Children weighing 20 to 40 lb. (9.1 to 18.1 kg.) should be restrained in an approved forward facing CRS**
- **Children weighing over 40 lb. (18.1 kg.) should use the standard lap belt that is attached to all airline seats**



## The Reality is:

- **Most children under 20 lb. fly unrestrained sitting on their parents lap**
  - Lap Children fly free
- **Many parents bring on board dual use automotive car seats for their children weighing 20 to 40 lbs.**
  - In the post 9/11 world, traveling through airports and past security with these seats is a daunting task
  - The large automotive car seats can be an egress problem on board aircraft



# AmSafe CARES: Child Aviation Restraint System

- AmSafe's Toddler Restraint



# Installation



- Single person installation
- Uses existing seat lap belt



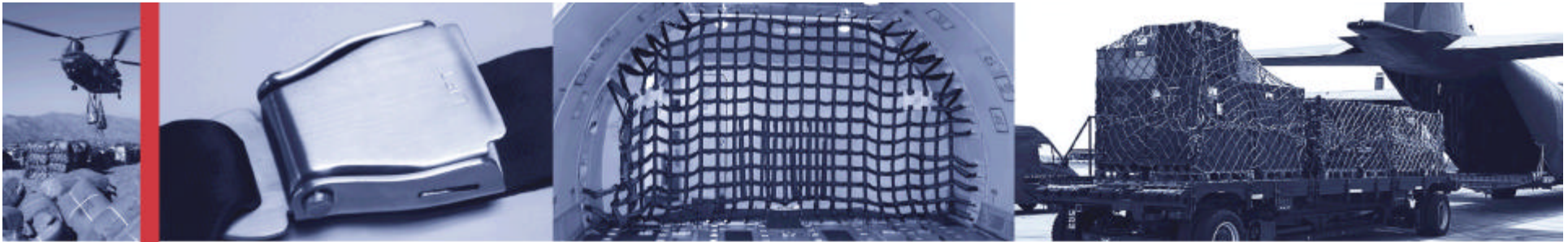
- Easily adjusted
- Familiar hardware
- Light weight

- Does not impede other passengers



- Can be installed quickly
- Small storage envelope



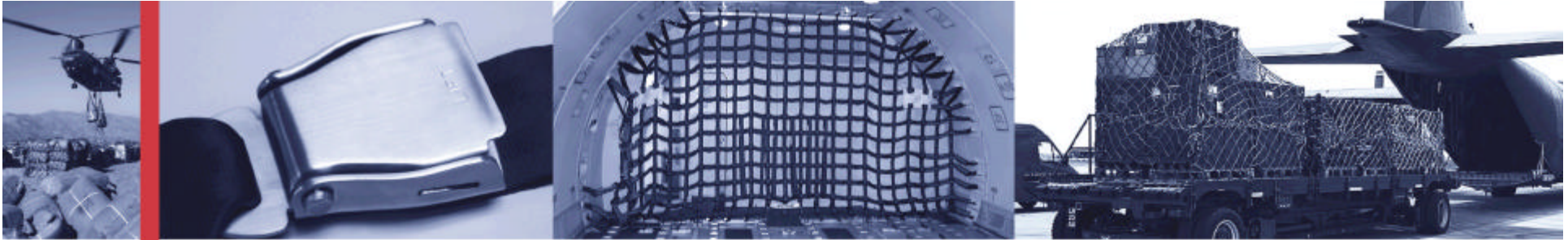


# CAReS Dynamic Test Video

Lap Belt Only

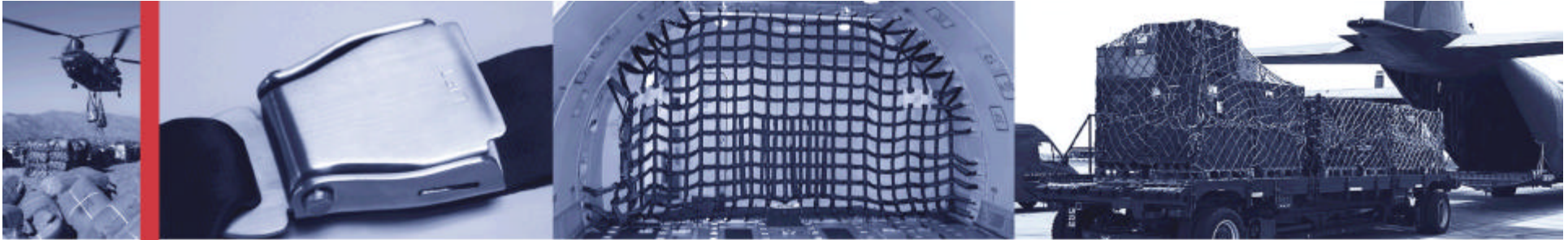
CAReS





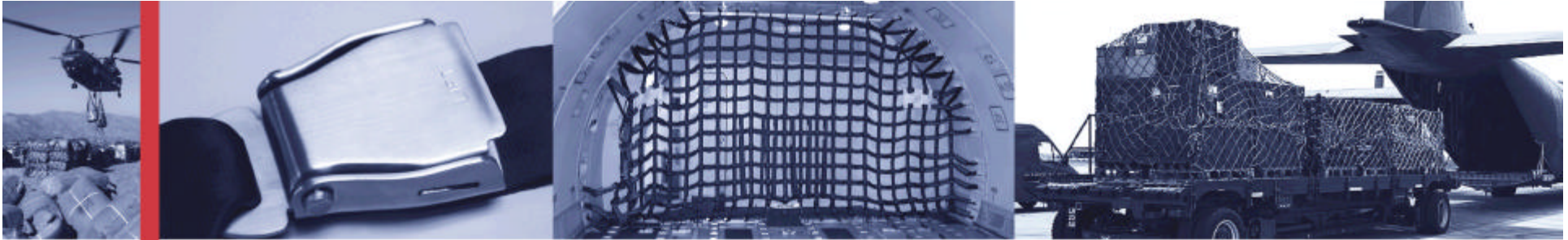
## CARes Certification:

- There does not exist a TSO to describe/certify a product like CARes
- There are existing regulations prohibiting “vest style harnesses”
- The STC process (airframe and LOPA specific) would have been far too costly for the commercial roll-out of this product



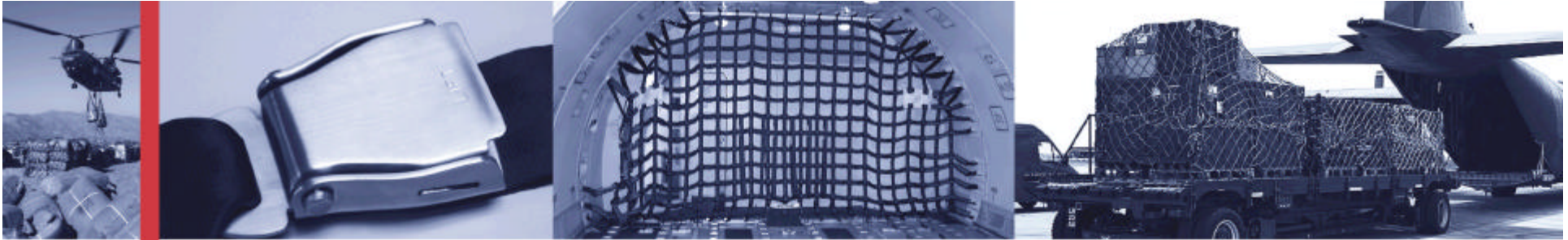
## Other considerations:

- **Most airlines enthusiastically support CARES but want parents to buy and bring on board like car seats**
  - Hygiene and logistics make an extension belt model harder for airlines to support



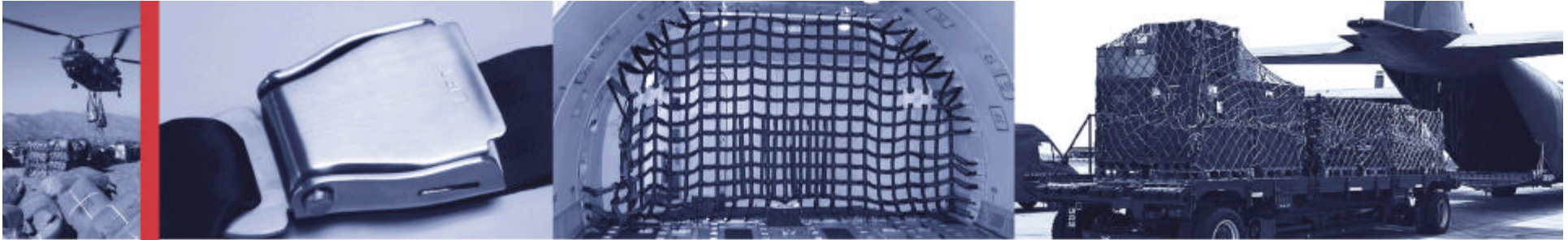
## **AmSafe meets with Senior FAA Team:**

- **All agreed that we wanted to see CARES fly**
  - **We recognized that multiple FAA disciplines would need to participate in the process**
    - **AIR-100, AIR-120, AFS-200, ARM, AVS-1, CAMI**
  - **A project team with both FAA and AmSafe personnel was formed to work together to find a cost and time effective solution**
  - **Effort began in October 2005, and we expect final certification approval in July 2006**



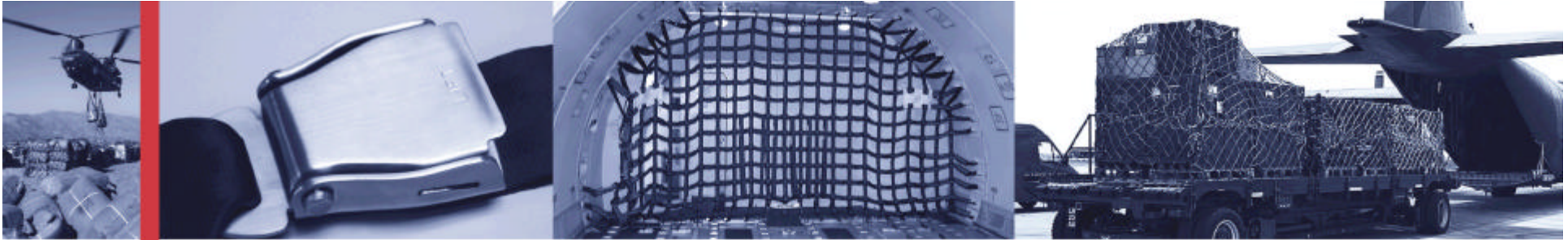
## CARes Certification Basis:

- **Title 14 CFR 21.305, Approval of Materials, Parts, Processes, and Appliances, Paragraph (d)**
  - **In any other manner approved by the Administrator**



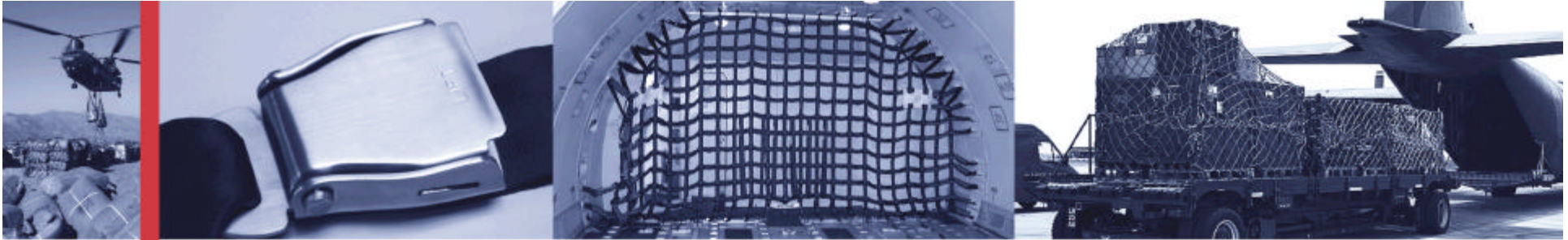
## CARes Certification Basis:

- **We jointly developed with the FAA a list of requirements to demonstrate airworthiness**
  - **Equivalent Level of Safety (ELOS) to TSO-C100b**
  - **Key elements of AS 5276/1 and AS8043**
  - **14 CFR 25.562 testing**
  - **Applicable marking and labeling**
  - **Installation/Egress evaluation and demonstration**



## CARes Certification Basis:

- **AmSafe's certification demonstration plan was submitted to the FAA in a Project Specific Certification Plan (PSCP)**
  - A wide range of possible seat configurations were considered and evaluated
  - “Bracketed” dynamic test approach



## Lessons Learned:

- **Industry and the government can work together as partners**
  - FAA Leadership is willing to help their organization “Think outside the box”
- **In the early part of the project we self limited ourselves to existing certification options**
  - Don’t be afraid to be open and honest about what you need