Los Angeles ACO Experience

Use of Dynamic Analysis Methods For Aircraft Seat Certification

Presented to:
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Benefit

• Two seat design companies have tested the waters within the past 2 years

• Desired benefit
  – Shorten development time
  – Reduce number of costly development tests
  – Ability to down select and optimize new designs
Time Issue

• Both companies typically create derivative seats
  – Built in ability to create new seat configurations for delivery in as little as 3 months
  – Modeling current seat design requires long lead time.
  – Unwillingness to hire/create new modeling team
    • Initial start-up cost to create data base of previous designs
    • Manpower cost for dedicated engineering team
Hurdles

• **Need design to be CAD/CAE**
  – Ideal is to build design and model at same time
  – Reality is to model what you have

• **Validation of Model**
  – Ability to take past dynamic data to use in validation
    • Interest has come from newer entrants into seat design rather than from the established seat designers.
    • Established seat manufacturers have more data that could be used to establish a model base.
    • Were there enough measurements and loads acquired to accurately model?
Hurdles

- **Validation of Model (cont)**
  - Revalidation when design is not a derivative or novel design is implemented
    - Seat Pan: Metallic, Honeycomb and Dymetrol
    - Beams: Nested tube vs single variable wall tube
    - Floor seat track to floor and wall mounted seat tracks
ACO Challenge

- Branch does not have experience in this area
- Not conversant with the industry recommended practice, ARP 5765
- Not conversant with the FAA AC 20-146
Thought to Ponder – Failure

• **Case study**
  – Applicant had previously tested this seat and passed with no issues
  – FAA shows up to observe for credit test.
    • Would the model have been able to predict this failure?