Los Angeles ACO Experience

Use of Dynamic Analysis Methods For Aircraft Seat Certification

Presented to:

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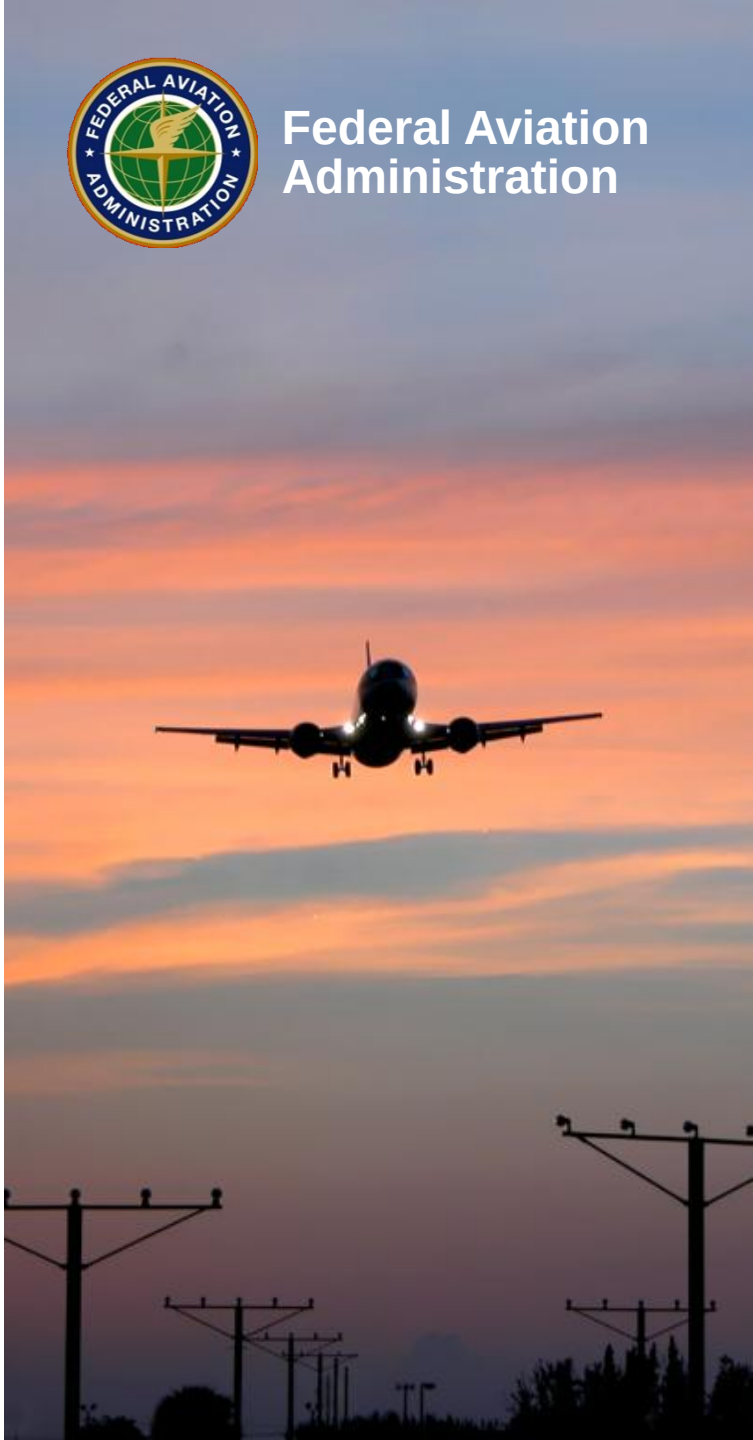
Federal Aviation Administration



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?