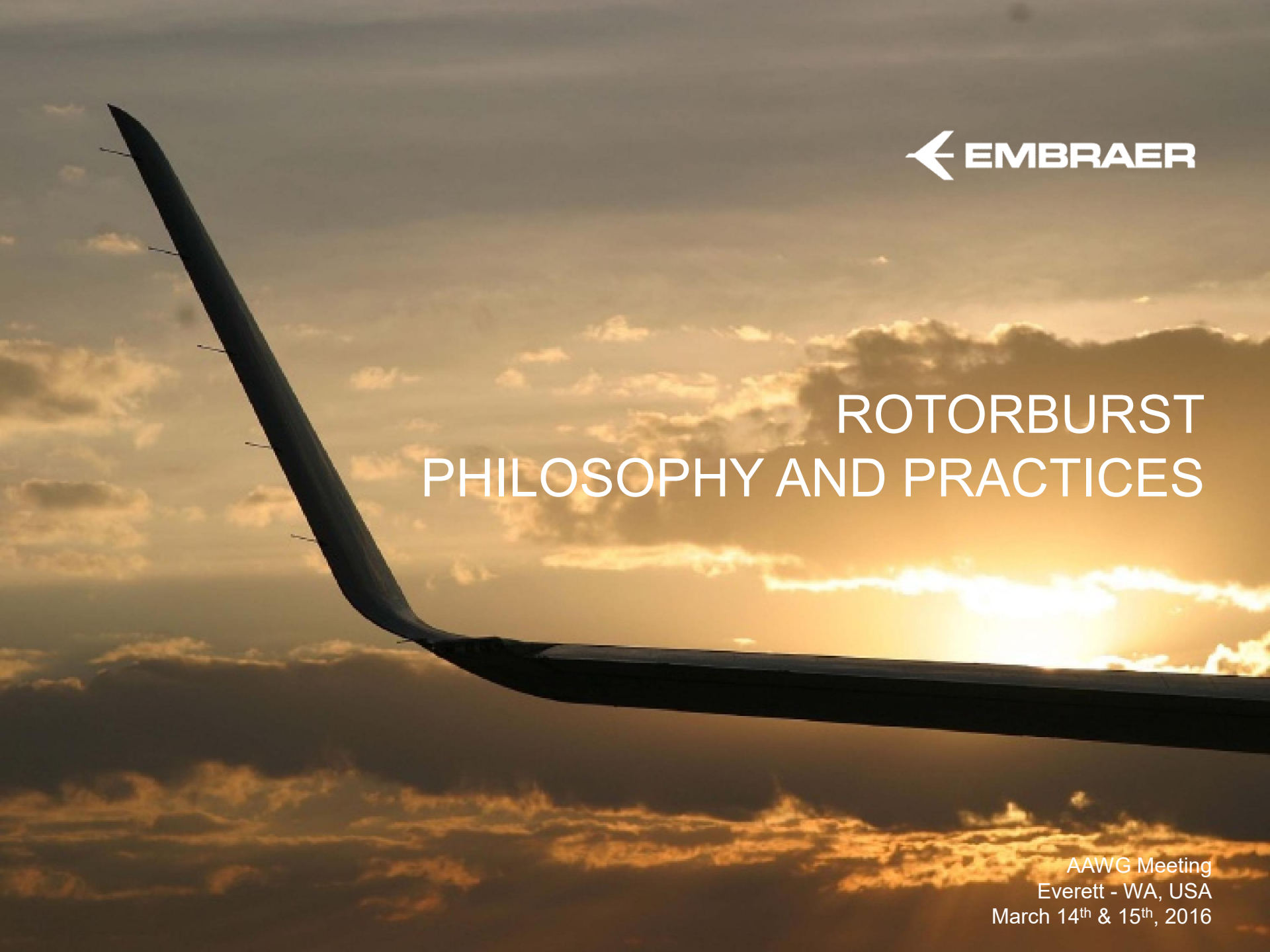


ROTORBURST PHILOSOPHY AND PRACTICES

AAWG Meeting
Everett - WA, USA
March 14th & 15th, 2016

ROTORBURST OBJECTIVE

This presentation provides a brief overview of Embraer practices for showing compliance of structures with rotorburst requirements, with the sole purpose of supporting the Airworthines Assurance Working Group (AAWG) discussions on the subject.

ROTORBURST PHILOSOPHY

Threat assessment

- § 25.571(e)
  - uncontained engine failure
    - AC 20-128A
      - rotor fragment
        - 1/3 rotor disc
        - infinite energy
        - spread angles

ROTORBURST PHILOSOPHY

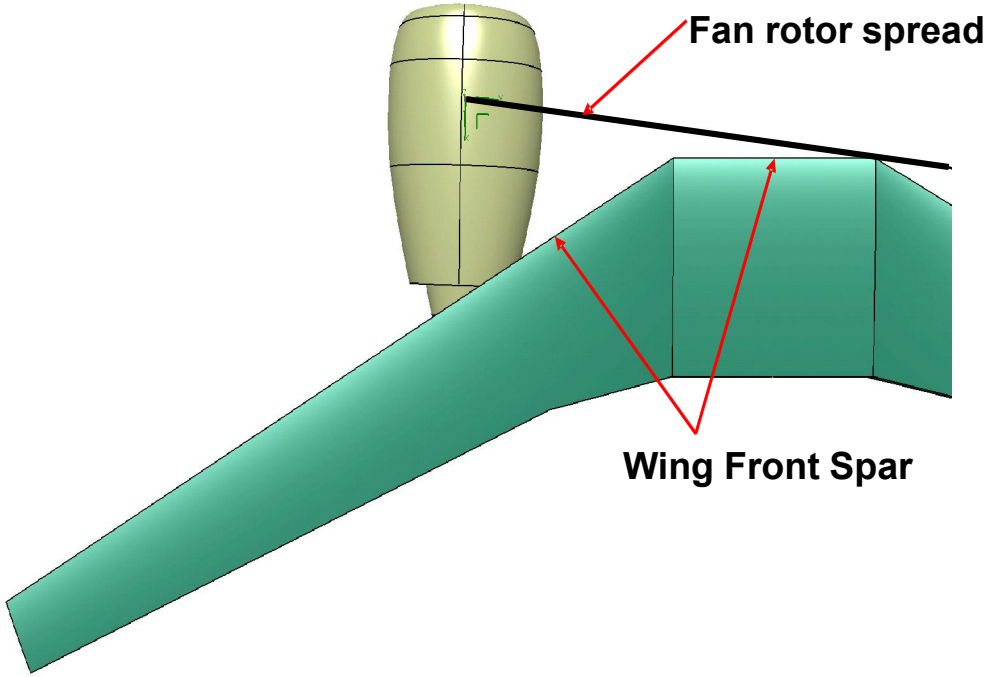
Philosophy

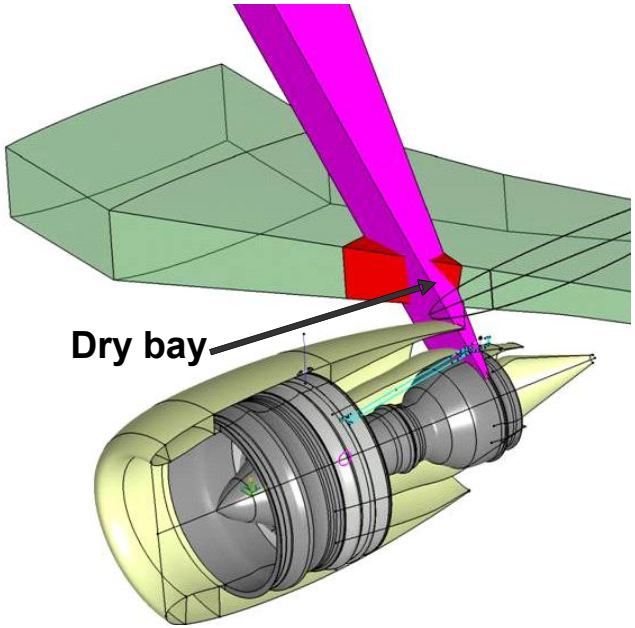
- Risk minimization by design precautions
  - aircraft layout
  - structure layout
  - structural details

ROTORBURST RISK MINIMIZATION

Rotorburst influence in structural design - Examples

- Wing mounted engines

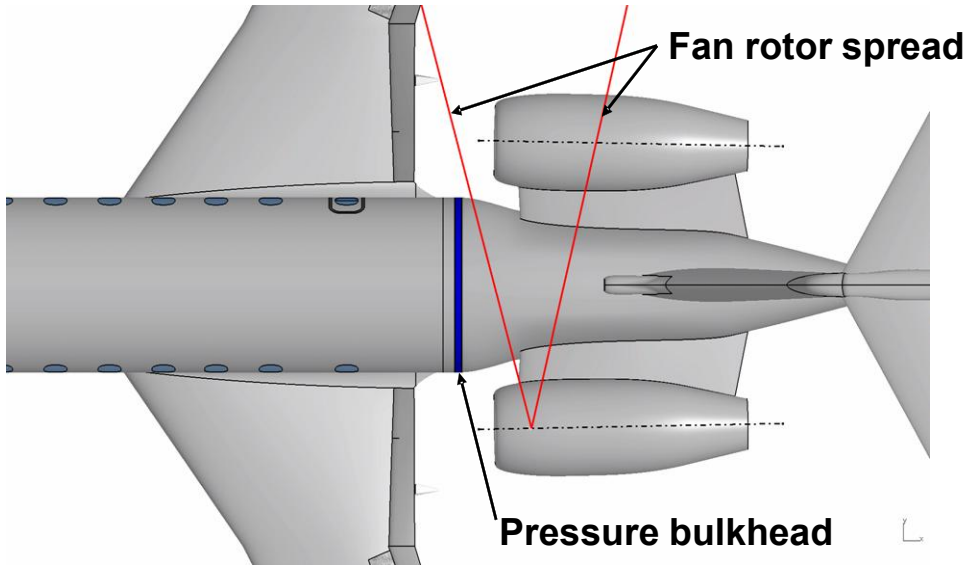




ROTORBURST RISK MINIMIATION

Rotorburst influence in structural design - Example

- Rear mounted engines



ROTORBURST PRACTICE

Practice

- Structure standpoint
  - § 25.571(e) / AC 25.571-1D
    - likely damage
      - residual strength analysis
        - go-home loads
      - flutter analysis
    - If likely damage is catastrophic for the structure
      - chance of catastrophic results less than 1/20
        - included in overall 1/20 chance allowed by AC 20-128A to comply with § 25.903(d)

ROTORBURST CONCLUSION

Summary

- Current practice
  - risk minimization by design precautions
  - residual strength analysis
  - aeroelastic analysis
  - overall (structres + systems) chance of catastrophic results less than 1/20 residual risk
- Other possible approaches like finite energy
  - possibly feasible but not practical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