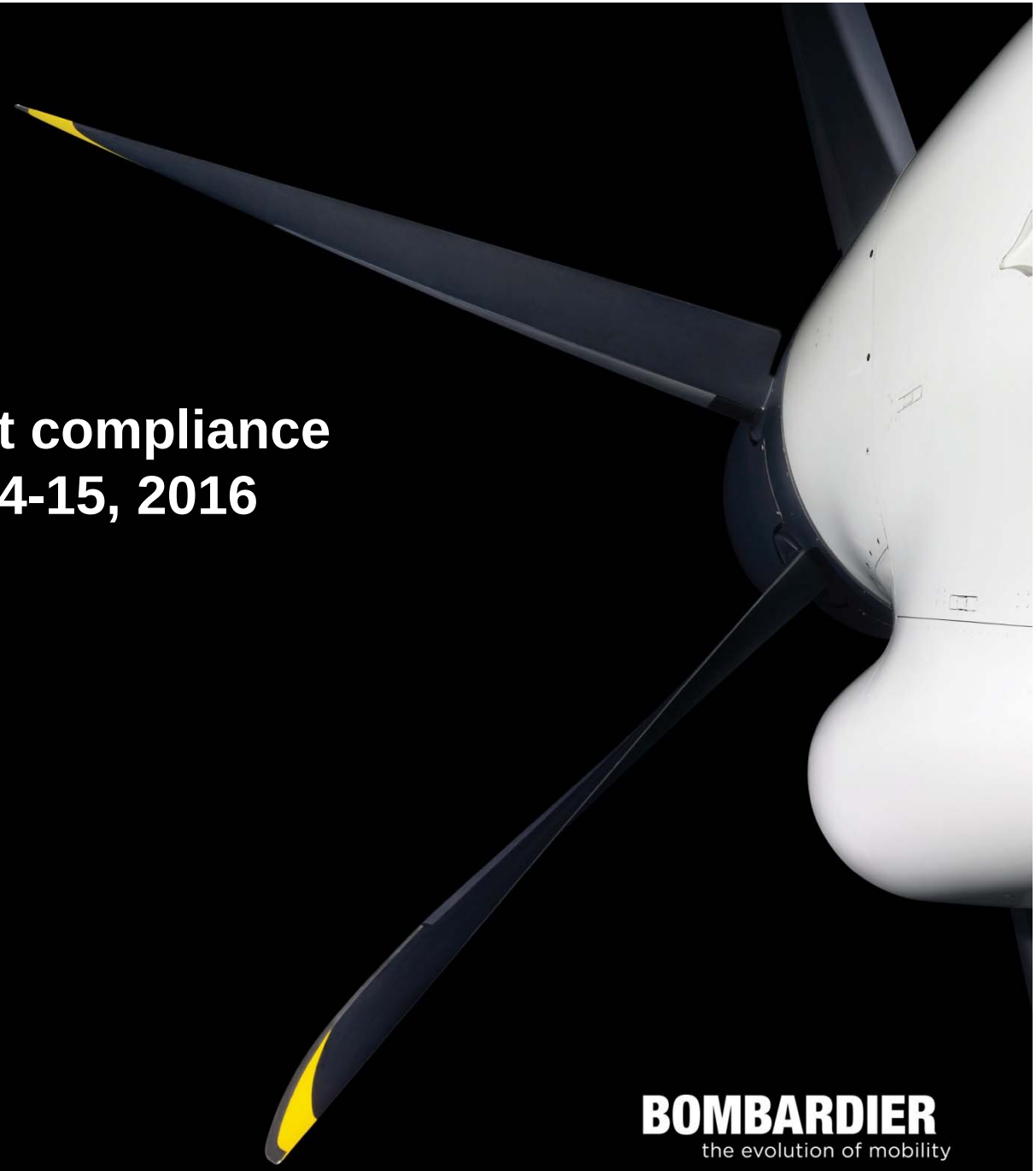
Ingenuity
in Flight.



Bombardier Rotorburst compliance
AAWG Seattle March 14-15, 2016

Alex Vinitsky
Salamon Haravan

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Risk assessment approach

- Bombardier compares calculated Flight Mean Risk to the required 1/20 probability.
- The Flight Mean Risk is evaluated at the aircraft level by combining critical systems and structures in accordance with §25.903 and AC 20.128A.
- Structural residual strength (in damaged state) is evaluated for all rotor stages and all critical structural components by considering full spread of translational and spread angle resulting in construction of "window" diagrams per stage.

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Risk assessment approach

- Catastrophic failure is declared on the basis of structural inability to carry "get home" loads defined in AC 25.571.
- Flight Mean Risk is evaluated on the basis of averaging risks over all engine stages. For all "airborne" conditions structural probability is declared equal to 1.0, hence no credit is taken for flight phase.
- All ground conditions are not considered catastrophic as the aircraft is not subjected to loads defined in AC 25.571 (no maneuver and gust loads).

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Risk assessment approach

- Bombardier evaluates flight Mean Risk for each stage separately in order to compare it with 1/10 at aircraft level (system and structures combined).

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Risk minimization practices

- For latest aircraft programs, materials with improved fractured toughness such as aluminum lithium as well as use of composites realized to provide enhanced damage capability to rotor burst event.
- Frame and stringer as well as wing sizing accounts for the effect of damage due to the rotor burst event (addressed in early design phases)
- For high altitude aircraft (fuselage mounted engines) rotor burst zones are located outside of the pressure shell (design objective)

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Q&A

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