ICING

Joint Safety Implementation Team
as Modified by JIMDAT

Implementation Plan
for
Safety Enhancement 134R1
Icing - Aircraft Design - Avionics

Statement of Work:
To prevent fatal accidents and incidents by improving situational awareness during low visibility operations and flight in icing conditions, avionic equipment manufacturers and aircraft manufacturers should develop and install smart pitch guidance systems on new type designs to prevent over rotation in conjunction with a low energy state or aerodynamic degradation due to the presence of ice on critical flight surfaces. The smart pitch avionics system should provide to the flight crew appropriate flight guidance information, the current aircraft energy state, and performance margins with respect to stall speed and maximum angle of attack for all icing conditions for which an aircraft has been certified.

Lead Organization for Overall Safety Enhancement Completion (LOOSEC):
Aerospace Industries Association (AIA)

Safety Enhancement (SE 134):
Install smart pitch guidance systems on all new type designs to prevent over rotation in conjunction with a low energy state or aerodynamic degradation due to the presence of ice on critical flight surfaces

JIMDAT Score:

DIP Stand Alone Fatality Risk Reduction:
2020 - (1.73) 100% - (3.46)

Differential beyond original 46 SE CAST plan:
2020 - (0.47) 100% - (0.93)

Outputs:

Output 1

- For new type designs, develop and install smart pitch guidance systems.

  Resources: AIA (LOOC), Airframe and Avionic Manufacturers

  Total government/industry resources: $4,800,000

Timeline:
AIA communicate with manufactures within six months of CAST G level approval.
Six months for manufactures to respond to request.

Actions:

1. CAST requests that the AIA communicate with manufacturers, encouraging them to incorporate upgraded pitch guidance software into their new airplane type designs.
2. Manufacturers respond by indicating their intentions regarding incorporating upgraded pitch guidance software into their new airplane type designs. Determination that upgraded pitch guidance for icing is not necessary, shall be based upon a technical justification.
3. Airframe manufacturers develop pitch guidance requirements that provide flight guidance information, the current aircraft energy state, and performance margins with respect to stall speed and maximum angle of attack, appropriate to aircraft type for all icing conditions for which the aircraft has been certified.
4. Avionic manufacturers incorporate the new pitch guidance algorithms into the flight guidance computer.
5. Avionic and airframe manufacturers certify the new pitch guidance system.

Relationship to Current Aviation Community Initiatives:

- Fokker F100 improved flight director
- General trend in manufacturers new aircraft designs for incorporation of advanced pitch director systems
- Implementation of SE 34 from the Loss of Control JSAT/JSIT

Impact on Non-Part 121 or International Applications:

- All operators will be affected by design procedure/changes for affected airplanes