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**Loss of Control
Joint Safety Implementation Team
Implementation Plan
for
Autoflight Features in New Airplane Designs**

Statement of Work:

To reduce fatal accidents due to loss of control, recommend and support the development of regulations and guidance material that ensure or encourage autoflight (autopilot and autothrust) systems in new airplane designs to accomplish the following:

- Minimize the probability of creating a thrust asymmetry that could lead to loss of control.
- Yield control to significant manual flight control forces (e.g., force disconnects).
- Annunciate to the flight crew if aircraft response differs significantly from what the autopilot has been commanded to do.
- Ensure autopilot internal monitor logic does not inappropriately disconnect the autopilot when it is properly attempting to correct for deviations from the commands it receives.
- Include low speed protection.

Lead Organization for Overall Project Coordination (LOOPC):

FAA AIR-1

Safety Enhancement:

New airplane designs incorporate autoflight systems that assist the pilot in potential loss-of-control situations and minimize the potential of causing or contributing to loss-of-control.

Score: 2007-(0.0) 2020-(1.1) 100%-(5.4)

Outputs:

Output 1:

Regulations and guidance materials are in place that adopt principles embodied in the final report of the ARAC Flight Guidance System Harmonization Working Group (FGSHWG) such that the following JSIT issues are addressed:

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- Minimize the probability of creating a thrust asymmetry that could lead to loss of control.
- Yield control to significant manual flight control forces (e.g., force disconnects);
- Annunciate to the flight crew if aircraft response differs significantly from what the autopilot has been commanded to do;
- Ensure autopilot internal monitor logic does not inappropriately disconnect the autopilot when it is properly attempting to correct for deviations from the commands it receives.
- Include low speed protection.

The ARAC FGSHWG final report submission to the FAA and JAA is expected to include specific recommendations for amending FAR 25.1329, JAR 25.1329, AC 25.1329, and ACJ 25.1329.

Resources: ANM-100 (LOOC), all ARAC Flight Guidance System Harmonization Working Group membership

Total government/industry resources: \$0.2M (see separate worksheet for details)

Timeline: 180 days for ARAC to report recommendations (using current ARAC group), 4 years to amend the FAR, JAR, AC, and ACJ.

Actions:

1. ARAC FGSHWG provides its recommendations to the FAA.
2. FAA takes rulemaking action as appropriate.
3. JAA takes rulemaking action as appropriate.
4. FAA produces accompanying guidance material.
5. JAA produces accompanying guidance material.

Relationship to Current Aviation Community Initiatives:

ARAC Flight Guidance System Harmonization Working Group

Performance Goals & Indicators for Outcomes/outputs:

Goal: New airplane designs incorporate automatic flight control systems that assist the pilot in potential loss-of-control situations and minimize the potential of causing or contributing to loss-of-control.

- Indicator: ARAC releases recommendations
- Indicator: Manufacturers agree that new material meets intent of ARAC FGSHWG
- Indicator: FAA completes rulemaking activity
- Indicator: FAA publishes guidance material
- Indicator: JAA completes rulemaking activity
- Indicator: JAA publishes guidance material

Programmatic Approach:

Organizational Strategy

The LOC JSIT identified Bob Robeson, AIA, as the JSIT project lead for Autoflight Features in New Airplane Designs. The project lead will assist with the implementation of the activities outlined in this Implementation Plan and will, when requested, provide progress reports to the CAST. Implementation of this project is viewed as a shared responsibility and tasks will be divided between the FAA and organizations/persons in industry. The Lead Organization for Overall project Coordination (LOOPC) is AIA. The Lead Organizations for Output Coordination (LOOC) are identified in each Output of this Implementation Plan. The roles and responsibilities of the LOOPC and LOOC are described in the CAST approved JSIT Process Document.

Implementation Activities

The Loss of Control JSIT Airplane design team has coordinated with the ARAC Flight Guidance System Harmonization Working Group to ensure the intent of the proposal is included in their recommendations for rulemaking activity. All of the JSIT Autoflight Features In New Airplane Designs recommendations, have been adequately addressed by the ARAC. The FAA and JAA should review the ARAC recommendations and undertake the appropriate rulemaking and guidance material development activity. The manufacturers, including airframe and autoflight manufacturers, will monitor and comment on the regulations and guidance materials as they are presented for public comment. Any differences that arise will be resolved with consideration for the JSIT recommendations.

Key Products and Milestones:

- ARAC recommendations – 180 days
- Amended FAR/JAR 25.1329 – 4 years from receipt of ARAC recommendations
- Amended AC/ACJ 25.1329 – 4 years from receipt of ARAC recommendations

Plan and Execution Requirements:

Changes to certification rules and guidance materials only affect new airplane designs. Design changes, by nature, take a long time and require significant resources. Incorporating new safety features into new airplane designs is technically feasible and desirable. However, it takes many years for these changes to have a significant impact on overall fleet safety, given the time it takes to develop a new airplane and for these airplanes to become a significant part of the fleet.

Risk Description:

- Normal policy/rulemaking process and timeframe (e.g., ARAC, harmonization, etc.)
- Potential failures to properly implement regulatory and advisory material
- New airplanes will represent a miniscule part of fleet in 2007
- Potential economic burden on manufacturers and operators
- Potential inadequate resource availability for manufacturers and operators and FAA

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Risk Mitigation Plan:

- JSIT will work with ARAC to address its recommendations prior to CAST formal request
- CAST will support timely and successful completion of ARAC activity
- CAST will support the incorporation of the ARAC recommendations into rulemaking and guidance material development

Impact on Non - Part 121 or International Applications:

All operators of new airplanes will be impacted by changes to the design.