

Crew Awareness of and Authority over Systems Affecting Flight Path and Energy

Technological innovations can bring new and possibly more automation to the flight deck in the form of systems that affect airplane flight path, speed or energy state. For brevity, these systems are referred to as **Systems Affecting Flight Path** and cover both manual and autopilot operations.

Affecting the flight path means that a system can control either flight control surfaces or thrust. This paper focuses on the cooperation between these systems and the pilots.

IFALPA believes pilots need to be aware at all times of the status of systems affecting the flight path, how to react to that status, be able to take over full control when desired and be adequately trained in using these systems. No exceptional skill, alertness, or strength on the part of the pilot should be required to assume control over the airplane. This enables the pilots to have the final authority and command over the airplane's flight path.

SYSTEMS AFFECTING FLIGHT PATH

Normal Operation

Pilots should be given the full and sole authority and capability to select the level of automation for systems affecting flight path. Pilots should be aware of system status at all times.

- The status of systems affecting flight path should be clearly indicated without any ambiguity or complexity.
- Automatic reconfiguration causing a change of system status affecting flight path should be clearly indicated to the pilots.
- Automatic reconfiguration causing a change of system status affecting flight path should have an immediate ability to undo or override the reconfiguration, when erroneous or if judged necessary for flight safety.

- Based on established procedures, the system status affecting flight path should be selectable by pilot action.
- The unavailability of a system affecting flight path should be clearly indicated without any ambiguity.

Non-normal operation

In abnormal and/or unforeseen circumstances, flight path system operation might not be adequate or desired for the situation. The pilots should be able to select a lower level of automation and be able to completely disengage any malfunctioning system, thereby regaining manual control of the airplane.

This selection or disengagement should be simple and intuitive, and available through a dedicated procedure. In addition, it should always be clear to the pilot which level of automation of systems affecting flight path is active.

A system affecting flight path should not have a failure mode causing the airplane to be incapable of continued safe flight and landing requiring exceptional skill, alertness, or strength on the part of the pilots. A clear indication of the failure condition is of major importance for the pilots to cope with the situation safely.

Innovation of Systems Affecting Flight Path

Newly designed systems affecting flight path should only be installed to address proven safety issues solely to improve safety.

Knowledge and training on Systems Affecting Flight Path

Pilots should be trained on the design and behaviour of systems affecting flight path. Pilots should have adequate knowledge of the system architecture to understand, at all times, the automation state the airplane is in. The quality and depth of information provided in the airplane manual should enable the pilot to avoid automation surprises and prevent overreliance on automation. This training should not be burdensome, nor should it contain complex new procedures to accommodate a change in system architecture.