Automation must not degrade decision making skills

I read "Topsy Turvy" and "Grappling with the Unexpected" (*ASW*, 11/09, p. 20 and p. 26, respectively) with great interest.

As one familiar with flight operations, I suggest possible new avenues to identify why things happen:

Incident/accident investigations start with the affected pilot's ability to handle the unforeseen situation. Identifying a possible triggering point is next — changes from normal to abnormal conditions. These might vary through hidden gradual build-ups or external influence. They can result in the need for split-second decision making!

Regardless of modern well-equipped aircraft/warning systems, human brain capacity limits must always be taken into consideration. Automation must, for instance, include override systems, to enable the pilot-in-command to take corrective action. Such decision making requires human skill and experience.

On the other hand, flight simulator instruction has become an indispensable means of teaching procedures, but "upside down" aircraft positioning and feeling the actual g forces are impossible in a simulator.

In earlier days, many pilots were recruited from an air force milieu and fighter squadrons, well educated and used to handling aircraft in all axes.

Times have changed, however, and new pilot recruits have to be trained in civil aviation schools. "Unusual position recovery" training might therefore be one correct response; however, I believe this picture can be expanded a bit.

Among new generation pilots a change might be observed: from childhood, they have grown up with advanced computer games. This new kind of background has, perhaps, tended toward "autoflight complacency."

Observations from active pilots reported back to me, as an advisor to the International Federation of Air Line Pilots' Associations (IFALPA), hint of a complete new-pilot view that "autoflight" from the point of flap retraction after takeoff until full stop after landing, including autobraking, seems acceptable — worrying!

Flying as a profession ought to keep being a skilled art, since it includes obeying laws of nature. Actual flying by feel, such as visual, minimum circling approaches, etc. is good training.

Initial, progressive pilot education is essential, followed by continuous skill updating and training. An engine failure will not be adjusted by the autoflight mode. Situations outside autoflight control, perhaps slight discrepancies, might pass unobserved by the pilot.

IFALPA AIR (Airworthiness Study Group, now AGE/ADO) has always had a high priority of merging human brain capacity with high-stress piloting work.

"Pilot reaction time" has for decades been standard within FARs Part 25 aircraft certification. Everything has limits and that includes how much instant stress even a well-trained human brain can take, as well as the ability to make the correct "split-second decision."

Further, AIR's message to aircraft manufacturers was, "Do not fill up cockpits with all kinds of warnings." For example, a howling horn, with simultaneous flashing lights for stall warning, which would be more nerve-wracking than useful, was not acceptable.

Acceptable was: "Bell ringing, red light = fire." Likewise, "aural horn signal, red light = unsafe gear." "Stick shaker = stall warning," etc. For lesser priority warnings, various voice messages were OK.

Nowadays, with the introduction of all-remote-controlled aircraft, ever-increasing weight, etc., a new updated understanding of human brain capacity versus technological expansion ought to be considered.

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