Schweizerische Eidgenossenschaft
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# Safety recommendation no. 457

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| **Date of the publication** | 22.11.2012 |
| **Number of the final report** | 2158 |
| **Safety deficit** | On 20 July 2011 at 08:53 UTC the AVRO 146-RJ100 aircraft, registration HB-IXP, took off under flight number LX 5187 and radio call sign "Swiss five one eight sev-en" on a ferry flight from Nuremberg to Zurich. On this flight the copilot was pilot flying and the commander was pilot not flying.<br>During the approach to Zurich airport the inertial reference unit 1 (IRU 1) failed. The copilot was then confused by the sudden appearance of a high bank angle warning ("bank angle") and no longer trusted the indications on his electronic flight instrument system (EFIS). The commander therefore took over control of the air-craft. On his side, no indications were available as a result of the failure of the IRU, so he was relying on the standby instruments to control the aircraft. Although he had practiced this kind of aircraft control in the simulator a few months previously, he was able to control the aircraft only to a limited extent using these instruments. Attitude, altitude and speed varied considerably for some minutes.<br>In the present case, controlling the aircraft solely with the aid of the standby instruments turned out to be very demanding, as the instruments, owing to their construction and their layout on the instrument panel, can be read only with a certain parallax effect. Also, the size and scaling of the instruments make it difficult to read the attitude and airspeed. It is therefore conceivable that some of the fluctuations in attitude, altitude and speed which occurred in this serious incident are attributable to the fact that scanning had become more difficult for the commander. This was confirmed among other things because for several minutes the commander did not notice that he had a correct heading indicator available.<br>More modern standby instruments, thanks to their design and layout, facilitate reliable reading of the attitude and owing to the integration of heading and speed information make scanning easier.<br>The AVRO 146-RJ100 aircraft will remain in service, at least with Swiss European Air Lines, for several years and a failure of systems which require control using the standby instruments will become more likely due to increasing age. For this reason, retro-fitting of the aircraft type with improved standby instruments would facilitate control of the aircraft and thus increase safety in the event of system failures.<br>In the same manner an improvement of aircraft with electromechanical standby instruments should be aimed for at least Europe-wide. |
| **Safety recommendation** | The European Aviation Safety Agency, together with the operators of aircraft, still equipped with electromechanical standby instruments, should examine whether their design still fulfills the today's requirements with respect to ergonomics. If this is not the case, an update with improved standby instruments should be arranged. |

Swiss Transportation Safety Investigation Board STSB
CH-3003 Berne
Tel.: +41 58 466 33 00, Fax.: +41 58 463 33 01
info@sust.admin.ch
www.sust.admin.ch

**Addressees**

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| **Stage of the implementation** | Not implemented. On 10 July 2013, EASA pointed out that the Avro 146-RJ aircraft type group had been certified in the 1990s in accordance with the specifications valid at the time. According to EASA, the electromechanical emergency instruments fulfil the approval criteria of the time. EASA is also of the opinion that there is no evidence that flight crews have experienced excessive difficulties in flying by these instruments alone. EASA therefore sees no reason to revise the certification criteria. |
| **Investigation report concerning the safety recommendation** | Final report<br>Schlussbericht |

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