Accident to BAC One-Eleven, G-BJRT (British Airways flight 5390), over Didcot, Oxfordshire on 10 June 1990

On June 10th 1990 in the UK, a BAC1-11 (British Airways flight 5390) was climbing through 17,300 feet on departure from Birmingham International Airport when the left windscreen, which had been replaced prior to flight, was blown out under the effects of cabin pressure when it overcame the retention of the securing bolts, 84 of which, out of a total of 90, were smaller than the specified diameter. The commander was sucked halfway out of the windscreen aperture and was restrained by cabin crew whilst the co-pilot flew the aircraft to a safe landing at Southampton Airport.

The Shift Maintenance Manager (SMM), short-handed on a night shift, had decided to carry out the windscreen replacement himself. He consulted the Maintenance Manual (MM) and concluded that it was a straightforward job. He decided to replace the old bolts and, taking one of the bolts with him (a 7D), he looked for replacements. The storeman advised him that the job required 8Ds, but since there were not enough 8Ds, the SMM decided that 7Ds would do (since these had been in place previously). However, he used sight and touch to match the bolts and, erroneously, selected 8Cs instead, which were longer but thinner. He failed to notice that the countersink was lower than it should be, once the bolts were in position. He completed the job himself and signed it off, the procedures not requiring a pressure check or duplicated check.
There were several human factors issues contributing to this incident, including perceptual errors made by the SMM when identifying the replacement bolts, poor lighting in the stores area, failure to wear spectacles, circadian effects, working practices, and possible organisational and design factors.

Incident involving Boeing 737, G-OBMM near Daventry, on 23 February 1995

In the UK in February 1995, a Boeing 737-400 suffered a loss of oil pressure on both engines. The aircraft diverted and landed safely at Luton Airport. The investigation discovered that the aircraft had been subject to borescope inspections on both engines during the preceding night and the high pressure (HP) rotor drive covers had not been refitted, resulting in the loss of almost all the oil from both engines during flight. The line engineer was originally going to carry out the task, but for various reasons he swapped jobs with the base maintenance controller. The base maintenance controller did not have the appropriate paperwork with him. The base maintenance controller and a fitter carried out the task, despite many interruptions, but failed to refit the rotor drive covers. No ground idle engine runs (which would have revealed the oil leak) were carried out. The job was signed off as complete.

In all three of these UK incidents, the engineers involved were considered by their companies to be well-qualified, competent and reliable employees. All of the incidents were characterised by the following:

- There were staff shortages;
- Time pressures existed;
- All the errors occurred at night;
- Shift or task handovers were involved;
- They all involved supervisors doing long hands-on tasks;
- There was an element of a “can-do” attitude;
- Interruptions occurred;
- There was some failure to use approved data or company procedures;
- Manuals were confusing;
- There was inadequate pre-planning, equipment or spares.

Source: AAIB, 1988

1 http://hfskyway.faa.gov
2. www.aaib.dtlr.gov.uk