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CO-CAPTAINS! REALLY?

Substantial Damage

September 14, 2007, was not a happy day for two experienced captains. They were approaching Runway 20L at Atlanta's DeKalb-Peachtree Airport in their Israel Aircraft Industries/ Astra SPX (now a Gulfstream 200). It was in the afternoon and the ceiling was broken at 1800 ft. It was raining, sometimes heavily. The runway was 6001 ft long, and wet. During the approach in IMC, visibility was around 1¼ miles above minimums. The company's flight department's chief pilot sat on the right-hand seat. He was designated as pilot-in-command (PIC). The second-in-command (SIC), in the left-hand seat, was a captain for the flight department. The SIC was pilot-flying on this sector.

AMBIGUITY
The accident was due to conflicting cockpit information.

The aircraft was established on the ILS 20L and the pilot flying followed the glide slope. The pilot-non-flying monitored the approach and then announced that the approach lights were in sight. The pilot-flying responded that he also had the approach lights in sight. He disengaged the autopilot. He intended to fly the approach visually.

It was raining moderately, sometimes heavily. The pilot-flying turned the windshield wipers on. After some 10 seconds, the left-hand windshield became blurred and the pilot lost visual contact with the runway. He told the pilot-non-flying who confirmed that the right-hand windshield was clear and that he still had visual contact.

At this stage, the pilot-flying considered a missed approach. The pilot-non-flying re-iterated that he still had the lights and began to verbally direct the pilot-flying. When touch-down finally occurred, there where only approximately 1'000 ft of runway left.

The aircraft overran the runway. It travelled for several hundred feet past the end of the runway after it struck the localizer antenna. Finally the aircraft stopped with impact damage to the nose, wings, engines and landing gear near the airport fence. Fortunately, only one minor injury resulted from this accident.

Account by the accident crew

After the Astra accident, the chief pilot stated he had previously experienced the same visibility problems with the windshield. The windshields had no coating and did not shed water. The windshield manufacturer's had advised about degradation of the coating's performance during the life of the windshield and had provided guidance to determine the acceptability of rain repellent performance, but this had not been followed by the maintenance provider.

With an opaque left windshield, the pilot-flying could only see his instruments. However, he had already lifted his head for a visual approach. The ILS approach had been changed to a visual approach. With hindsight it's difficult to understand why the pilot-flying didn't lower his head again to return to instrument flying. He could have continued on the glide slope. At minimum he could have handed over controls for landing to the pilot seated behind the clear window on the right

seat. To stop the abnormal situation developing into an emergency, the pilot-flying could have decided for a missed approach (as suggested by the tower) and then take the time to consider options.

During the approach, the chief pilot told the pilot flying to go "left, left, left, left". It was not clear, who was actually navigating the aircraft. Certainly the localizer and the glide slope were not followed.

NTSB also reports that during interviews after the accident the chief pilot stated that he was confused as to who was the PIC, and that both pilots were "co-captains".

Designation of Pilot in Command

It is a truism to state that when two pilots fly an aircraft together, coordination and a clear hierarchy on the flight deck are essential. And yet, accidents like this one remind us of how important it is. When two captains fly together, only one can be the pilot-in-command. This needs to be agreed before the flight. Both pilots need to feel comfortable with their roles and accept them.

The PIC carries the ultimate responsibility for the safety of the flight. When decisions must be taken quickly, he has the final word. In critical phases of flight and whenever abnormal or emergency situations arise, the PIC has to lead the crew, set priorities and assign duties and responsibilities to ensure the safety of the flight.

There are many factors which can influence this seemingly natural process. Factors such as age, flying experience, experience on type, company seniority, gender, race, nationality, family circumstances and flight ops managerial ranking which affect the social ranking of a pilot outside of the cockpit influence his perception of his role on the flight deck. When the perceived social rank of an individual in society conflicts with the hierarchy established for a particular flight, the potential for disruption in the chain of command is laid.

In the case of the Astra SPX crew the social inhibitors have worked in multiple ways: the PIC might have been inhibited from leading and from taking control in a critical situation out of respect for his fellow pilot. The SIC on the other hand might have been inhibited from asking for help from the PIC

and handing control to the PIC. He might also have been restrained from challenging the PIC's way of dealing with the abnormal situation by giving him directions. Either way social inhibitors got in the way of efficient, clear and pragmatic actions on the flight deck. An abnormal situation which could have been easily resolved ended in an accident.

Implication of Seating Position

The seating arrangement can also have an impact on the perceived hierarchy on the flight deck. It is standard practice for the PIC to be in the left seat. In aircraft certified for single-pilot operation the pilot is always seated on the left seat. On larger aircraft the controls for the nosewheel steering are only available on the left hand side. On the accident aircraft the SIC (!) was sitting on the left-hand side. This might have further confused the roles of the two pilots.

We are all Humans

On a memorable Safety Assessment of Foreign Aircraft (SAFA) inspection the SAFA inspector observed an aircraft taxiing in. The B737's strobe lights were still turned on, and they remained on during disembarkation. The inspector boarded the aircraft, entered the cockpit and found two pilots with four stripes on the flight deck. After a hint by the inspector, the pilot-in-command switched off the strobe lights.

The pilot-in-command later stepped out of the cockpit and told the inspector that he had told the second-in-command, who was also a senior captain, to turn off the strobes when vacating the runway. However, he did not dare to enforce the command against his peer. The pilot-in-command gave the impression to be very embarrassed.

During normal operations such conflicts might not have any adverse consequences, but during abnormal or emergency situations, ambiguities in the chain of command can be disastrous. When time is limited, and decisions need to be taken fast, there is no time for ambiguities and extended collaborative decision-making. Roles and responsibilities must be clear.

Clarity

All rule makers, government or industry, re-iterate the need to designate a pilot-in-command. It is the duty of each operator to establish procedures to designate a PIC for every flight. ICAO, national regulators and all industry standards, be it IOSA or IS-BAO, require this basic procedure. This role is also clearly documented on the flight plan as well as in the aircraft technical log.

In the case of flight department operating the accident Astra, the company had not developed any type of SOPs, but had only a title-based hierarchy, i.e. a hierarchy which formally was in place, but whose members did not discharge of their responsibilities since these were not formally stipulated.

A contributing factor to the lack of SOPs was the rapid recent growth of the flight operations department. With more people working together, more leadership and formalized structure is required to maintain the level of safety.

Headless Flying

To always be clear about who is PIC and who is SIC, who is pilot-flying and who is pilot-non-flying; to establish and follow clear procedures for the hand-over of control of the aircraft; to shape a realistic mental picture of the roles and responsibilities on a given flight; to avoid confusion of who is actually on the controls; these are some of the lessons we can learn from this accident. "Co-captains" are a recipe for disaster.

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NEGLECT
The B737's strobe lights still on while taxiing remained on during disembarkation.