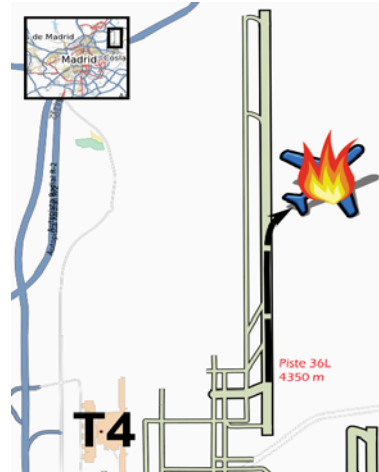


# PAYING THE PRICE OF NOT PAYING ATTENTION



By Michael R. Grüninger  
and Capt. Carl C. Norgren  
of Great Circle Services AG (GCS)

## 20. August 2008

Spanair Flight JK5022 was taxiing towards runway 36L at Madrid-Barajas airport for a flight to Gran Canaria. The MD82 was behind schedule. An overheat condition of the Ram Air Temperature (RAT) probe had caused it to abort an earlier take-off and return to the ramp for maintenance assistance. The RAT overheat condition was confirmed by maintenance and the aircraft was dispatched according to the Minimum Equipment List (MEL).

By the time the MD82 arrived at the holding point for its second take-off, the flight was more than an hour behind schedule. The temperature in the cabin had increased while the aircraft was parked on the ramp during the technical troubleshooting and passengers had complained of the heat. The pilots were eager to get airborne.

Flight JK5022 was cleared for take-off. Just after lift-off, the stall warning system activated. The aircraft banked to the right and impacted the ground within the airport perimeter. Of the 172 occupants of flight JK5022 a total of 154 were killed, including all 6 crew



members, and 18 were seriously injured.

The Spanish Civil Aviation Accident and Incident Investigation Commission (Comisión de Investigación de Accidentes e Incidentes de Aviación Civil, CIAIAC) established the cause of the accident to be the loss of control of the aircraft as a consequence of entering a stall immediately after take-off due to the omission of setting flaps and slats for take-off.

## Critical Phase

In the early 1980s the Federal Aviation Administration (FAA) introduced the concept of 'critical phase of flight'. The Joint Aviation Authorities (JAA) adapted the concept in JAR-OPS 1.192 (h) and prescribed that a crew member shall not perform any activities during critical phases of flight other than those required for the safe operation of the airplane in JAR-OPS 1.210. The European Community has transposed these requirements in EU-OPS which are applicable today. Taxiing is not defined in such requirements as a critical phase of flight, and yet, with hindsight, taxiing should be regarded as a critical phase of flight, in particular when complex aircraft need to be prepared for take-off.

How then could the experienced crew of flight JK5022 forget such a basic and vital item after having performed so many take-offs correctly?

The crew had to return to a remote position after a first attempted departure after having identified a RAT probe malfunction, interrupting the typical operational routine. Passengers were not disembarked, and after a while, started to complain about the hot temperature in the cabin battered by the sun without cooling. The crew started to be stressed and wished to facilitate minimizing the delay. A third person was seated in the jump seat. Crew and jump seater discussed the

**CARELESS**  
A poorly completed checklist contributed to the Spanair Flight JK5022 crash.

## SAFETY SENSE

### RULES AND REGULATIONS

issue while maintenance was active. It is understandable that the captain tried to speed up departure.

The cockpit voice recorder (CVR) disclosed that the crew continued to discuss the malfunction during taxi-



ing. The captain asked the co-pilot to contact ATC to ask for the clearance, while he was working through checklists. The crew omitted to select the flaps and slats. They omitted to cross-check their position although it was a separate item of the 'After Start' checklist. The crew did not check the position of the flaps and slats during the take-off briefing in the 'Taxi' checklist. Shortly before take-off the crew omitted to check the configuration although it was an item in the 'Take-off Imminent' checklist.

The cockpit voice recorder revealed that the crew did not adhere to standard procedures during their checklist work and were pre-occupied with non-safety-relevant activities during the taxi, including the use of personal mobile phones to inform friends of their delay. In fact, the take-off briefing was never performed, although the dispatch with the RAT inoperative had operational implications on the thrust setting and the use of auto-thrust for take-off.

#### LUCIDITY

A sterile cockpit period can start when the Fasten Seat Belt sign comes on, but be clear on the activities prohibited, or the results may be tragic.

#### Sterile Cockpit

Before departure the crew was worried about speeding up departure and violated sterile cockpit procedures in multiple ways.

Spanair's Operations Manual defined the sterile cockpit period as that time between the turning 'on' and 'off' of the "Fasten Seat Belt"-sign. The manu-

al did not specify what activities were prohibited during this time.

During critical phases of flight, pilots should maintain a sterile cockpit. In a sterile cockpit pilots should refrain from carrying out any activities not relevant to the safety of the flight. The definitions of critical phases of flight vary between operators and regulatory environments, but most define critical phases as all movements on the ground and climb, descent and approach phases in the air. Some operators apply sterile cockpit procedures below FL100 or transition altitude, whichever is higher.

Qantas for instance links restricted communications to sterile flight deck periods. For the period between doors closed and start of take-off roll, only safety related issues are to be communicated among crew members.

Personal conversations, non-safety related logbook items, company related transmissions, and passenger related items are not part of such communications. The commander is responsible for creating a flight deck atmosphere conducive to concentrated and relevant work. In the case of flight JK5022, the commander did not succeed in creating such an atmosphere. Chatter with the person on the jump seat, impatience to depart and a rushed flight preparation and taxi eliminated the safety barrier intended by the requirement to maintain a sterile cockpit.

#### What Can Pilots Do?

Although all pilots have heard and read about the sterile cockpit procedures, frequent violations of this basic component of good airmanship still occur. Most such violations do not have serious consequences. Yet every breach of the sterile cockpit has the potential to cause substantial harm. Company internal Safety Management Systems (SMS) reporting systems continue to yield insights into noncompliance with the sterile cockpit and the hazards caused by such noncompliance.

Essentially, a sterile cockpit is designed to let pilots focus on their work. It is about avoiding distractions and focusing on the task in hand, and also letting the other pilot focus on his work. The sterile cockpit creates an environment in which attention is focused on controlling the aircraft and operating the flight safely. The sterile cockpit was essentially designed to assist the crew maintain a professional attitude towards their work.

The sterile flight deck does not guarantee that no mistakes will be made by the flight crew, but it minimizes the probability of mistakes and creates the right atmosphere for mistakes to be detected and rectified before they cause any harm.



*Michael R. Grüninger is Managing Director and Capt. Carl C. Norgren is Head of Business Development of Great Circle Services (GCS) Safety Solutions. GCS assists in the whole range of planning and management issues, offering customized solutions to strengthen the position of a business in the aviation market. Its services include training and auditing (IS-BAO, IOSA), consultancy, manual development and process engineering. GCS can be reached at [www.gcs-safety.com](http://www.gcs-safety.com) and +41-41 460 46 60. The column Safety Sense appears regularly in BART International.*