

Human Behaviour in a Crisis – the Saudia 163 Accident, 1980

“The mind can go either direction under stress—toward positive or toward negative: on or off. Think of it as a spectrum whose extremes are unconsciousness at the negative end and hyperconsciousness at the positive end. The way the mind will lean under stress is strongly influenced by training.” Frank Herbert

One of the worst civil aviation accidents of all time, and one of the most bizarre, happened at Riyadh airport on 19th August 1980, when Saudi Airlines (or ‘Saudia’) Flight 163, a Lockheed Tristar, suffered an on-board fire. All 301 passengers and crew died of smoke inhalation while the plane was on the runway¹. There has been a lot written about this accident, much speculation, and some urban myths, and after more than three decades it is perhaps even less clear exactly what happened, although some new evidence has recently been reported.

All three of the flight crew of Saudi Airlines 163 had decidedly unimpressive training records. Captain Mohammed Ali Khowyter was aged 38 and had worked for Saudi Airlines since 1965. The official accident report notes that he was ‘slow to learn’, needed more training than was normally required, failed recurrent training, and had problems in upgrading to new aircraft.

First Officer Sami Abdullah Hasanain was aged 26 and had worked for Saudi Airlines continuously since 1977, and previously as a trainee in 1974-1975. He had first qualified on Lockheed Tristars only eleven days before the accident, on 8th August 1980. During his initial flying school training in 1975 in Florida the flight school had telexed Saudi Airlines advising of ‘poor progress’ and requesting advice about whether he should continue on the training programme. He was then dropped from the training programme on 31st October 1975. On 13th March 1977 he was re-instated into pilot training as ‘a result of committee action’; the exact meaning of this is unclear, but it could have been union action or else some ‘pulling strings’ at a high level.

Flight Engineer Bradley Curtis was aged 42 and had a curious CV. He had worked for Saudi Airlines since 1974. He was a pilot, who had been qualified as a Captain for Douglas DC-3 Dakotas. In 1975 he was assigned to transition training to be a Captain of Boeing 737s, but his training was terminated because of ‘Progress Unsatisfactory’ as either a Captain or a First Officer. Eventually, after further training, he was declared ready for work as First Officer on Boeing 737s, but following a check on 30th March 1978 he was recommended for removal from flying status. He was sent a letter of termination on 14th May 1978. Curtis then offered to pay for his own training to become a Flight Engineer on Boeing 707s. This offer was accepted by the airline, and he began work as a Flight Engineer onboard Boeing 707s on 24th January 1979. He later retrained as a Flight Engineer on Lockheed Tristars, being cleared for duty on 20th May 1980. The Saudi official accident report states that Curtis may have been dyslexic; during the accident, this may have affected his ability to locate the correct emergency procedures.

¹ Presidency of Civil Aviation, Jeddah, Saudi Arabia, “Aircraft Accident Report, Saudi Arabian Airlines Lockheed L-1011 HZ-AHK, August 19th 1980”, 16th January 1982



Fig 1: The burnt-out hulk of Saudi Airlines Flight 163 remained at Riyadh airport for several years. The engines were removed after the accident. (Michael Busby)

Flight 163 had flown from Karachi, Pakistan. After a stopover at Riyadh, Saudi Arabia, it took off again at 1807 hours, carrying mostly pilgrims on their way to Mecca for Hajj. The plane was carrying 287 passengers and 14 crew members.

Many of the passengers were poor Pakistanis and Bedouin, who had never flown before. Because they were on pilgrimage, many had brought their own cooking utensils, stoves and gas bottles on board with them. This would have been illegal, so these must somehow have been smuggled aboard, or else the pre-flight checks and security were very lax. Gas bottles were subsequently found in the plane wreckage.

At 1814:53, some seven minutes after take-off and while still climbing at about 15000 feet, a smoke detector alarm came up showing smoke in the aft cargo hold, followed at 1815:55 by a second smoke alarm in the same aft hold. Captain Khowyter said at 1815:59, "So, we got to be turning back, right?" but no immediate turn-around was effected. Captain Khowyter asked Flight Engineer Curtis to check the procedure for smoke alarms at 1816:18. Curtis could not find the procedure.

The plane continued its climb to cruise altitude. After more discussion between the Captain and the Flight Engineer, Curtis offered, at 1819:26, to go back in the passenger cabin to see if he could smell anything. Meanwhile, First Officer Hasanain was now trying to find the procedure for smoke alarms, without success. At 1819:44, while Curtis was still in the passenger cabin, Captain Khowyter told First Officer Hasanain "Tell them we're returning back" but Hasanain did not immediately do so. At 1819:58, Captain Khowyter again said "We better go, go back to Riyadh", but he didn't turn the plane back.

Meanwhile, Flight Engineer Curtis was still in the passenger cabin. While he was away, the Captain said to First Officer Hasanain, referring to Curtis, “By the way he’s a jackass, in the abnormal it is in the checklist” (*sic*), meaning that Curtis had been looking in the wrong place for the procedure.

At 1820:16, Curtis returned to the cockpit, “We’ve got a fire back there.”

Finally, at 1820:27, Riyadh airport was told “One six three, we’re coming back to Riyadh”, and it was only at this point, some five and a half minutes after the first smoke alarm, that the plane was turned round and began its descent back to Riyadh. About ten seconds later there was a radio message to Riyadh to say there was fire in the cabin. The plane was about 80 miles from Riyadh, at about 22000 feet.

During the flight, the transcript of the cockpit voice recorder sometimes notes that Captain Khowyter was ‘singing in Arabic’. It has been suggested (but I have seen no evidence) that he was praying.

The aircraft descended rapidly to Riyadh. During the descent there was mayhem going on in the passenger cabin as smoke became thicker. There were warnings to the flight crew of panic in the passenger cabin (1822:08, 1826:42), attempts to fight fire (1825:41, 1826:53), more smoke alarms (1824:16), and requests for passengers to remain seated (or otherwise not to panic) (1824:59, 1827:16, 1827:40, 1828:40, 1830:27, 1830:56, 1833:08, 1834:25, 1834:53). In the cockpit they had concerns about whether or not an emergency had been declared at Riyadh airport (1822:50), and pre-landing checks.

Engine number two developed problems at 1826:53 because, apparently, control cables were burned through. It was shut down and the remainder of the flight was completed on two engines.

At 1831:34, while still airborne, there was a discussion between Flight Engineer Curtis and a member of the cabin crew about whether passengers should be evacuated. “When we are on the ground, yes”, Curtis said. Notably, this discussion did not include Captain Khowyter.

At 1831:58, Flight Engineer Curtis asked Captain Khowyter, “Okay, right after landing do you want me to turn off all the fuel valves?” Khowter replied, “No, after we have stopped the aircraft.”

Throughout the approach, Captain Khowyter seemed to be flying the plane himself. This was undoubtedly not what should have been happening – he should have asked First Officer Hasanain to fly, and Khowyter should have concentrated on managing the crisis. However, Hasanain had only qualified eleven days previously. Perhaps Khowyter did not trust him to fly the plane in an emergency, in which case this put extra burden on Khowyter.

At 1832:10, while still airborne, Flight Engineer Curtis asked Captain Khowyter, “Do you want us to evacuate passengers, Captain?” Khowyter replied “What?” Curtis repeated, “Do you want us to evacuate the passengers as soon as we stop?” Khowyter did not reply.

Curtis said at 1834:04 that “The girls have demonstrated impact position”.

Curtis again said to Khowyter at 1835:17 “The girls wanted to know if you want to evacuate the airplane.” Khowter replied apparently in a noncommittal way, “Okay, huh.” Curtis repeated the

question but Khowyter did not answer. Hence, Curtis had asked Khowyter four times about evacuation without receiving a clear response.

At 1835:53, Khowyter is recorded singing in Arabic. At 1835:56, Curtis said “Looking good”.

Up until this point, the situation was still potentially going to end without disaster. Suddenly, at 1835:57, Captain Khowyter announced, “Tell them, tell them not to evacuate” for reasons that are unknown.

The last known communication from the passenger cabin was at 1836:09, when a member of the cabin crew warned passengers to adopt the ‘brace’ position for landing. Flight Engineer Curtis commented, “No need for that, we are okay, no problem”.

Landing was at 1836:20, and was reported by witnesses to be normal. Some ground staff noted that smoke was trailing behind the aircraft as it decelerated, but others reported they did not see smoke. It will have been close to sunset but visibility was still good.

The cockpit voice record stopped just before landing, for reasons unknown; the official report merely notes that it “ceased to function when the aircraft was about 30 feet in the air and on its landing approach”. Thereafter, the only known communications are exchanges with the control tower.

Captain Khowyter did not bring the aircraft to an emergency stop. Instead, the plane taxied for a further 2 minutes and 36 seconds, eventually coming to a halt at 1838:56.

During this time there were exchanges between the cockpit and the control tower, so the crew were still conscious. At 1839:06, the control tower asked if they wanted to continue to the ramp or to shut down. The aircraft replied “Standby” and then “Okay, we are shutting down the engines now and evacuating.”

After a critical further minute and a half, at 1840:33, the aircraft reported to the control tower “Affirmative, we are trying to evacuate now.” This was the last transmission received from the aircraft. An eyewitness who had followed the aircraft onto the taxiway in a car later said he had observed fire through the windows on the left hand side of the cabin. He could not see any movement on board. It therefore seems quite likely that, by this time, many or even all passengers and flight attendants will already have been dead or dying from smoke inhalation.

The engines were reported to have been shut down about three minutes after the aircraft stopped, which would be about 1842:00. About one minute later smoke and flames engulfed the aircraft, with a flash fire occurring within the fuselage. Firemen tried to open the doors, at first unsuccessfully, even though cabin pressure was ambient. Eventually, at about 1905 hours, a door was opened. Everyone was dead, and all the bodies of the passengers and the cabin crew were found crowded at the front the passenger cabin, apparently trying to escape the smoke and flames coming from the aft hold.

Autopsy examinations indicated that carbon monoxide poisoning was the cause of death. Some burns had been caused by the flash fire, but these were inflicted *post mortem*.

There had apparently been no attempt made to open the doors from inside the aircraft, indicating that perhaps the passengers and cabin crew were already dead or unconscious at the time of landing, or shortly thereafter.

The exact cause of the fire was not determined, although pilgrims' carriage of gas bottles must be a strong suspect.

For many reasons, this event should never have been the disaster it became:

The fire in the aft hold very probably started (although this was never fully established) because of cooking equipment and gas bottles being carried illegally on board by pilgrims on their way to Mecca.

Captain Khowyter took far too long to turn back after the first smoke alarms went off. The five and a half minute delay between receipt of the smoke alarm and the decision to turn back was critical to survival. (However, it should be noted that the Saudi Airlines emergency procedure recommended that confirmation of fire alarms should be sought before taking emergency action.)

At no point during the crisis was there any suggestion made by the flight crew that passenger oxygen masks could be made available. The official report simply notes that "the flight station oxygen system and the passenger oxygen system were not utilised during the flight".

Preparation should have been made, before landing, for an emergency evacuation. The landing should have been followed immediately by an emergency stop and prompt evacuation. The plane could have stopped moving two minutes earlier than it did so, and this might have had a significant effect on survivability and mortality. The Captain, by not shutting down the engines until three minutes after the aircraft stopped, prevented the cabin crew from initiating an emergency exit (even if he had not already said they were not to do this).

First Officer Hasanain did not take an active role in events; he should have been helping the Captain, he should have been more assertive, and he should have been actually flying the plane. Flight Engineer Curtis' relationship with the Captain seems to have been poor; the Captain ignored direct questions from him (including repeated requests about passenger evacuation), and called him a 'jackass' for failing to find the appropriate emergency procedure quickly.

The question remains: Why did Captain Khowyter not bring the aircraft to a rapid halt, stop the engines and order an emergency evacuation? The official report does not offer any explanation. One eyewitness, Michael Busby, who lived near Riyadh airport and watched events on the runway, published his account on the internet in 2010². He says the reason was that King Khalid's Boeing 747 was rolling on the runway at the time Flight 163 landed. (The official report, in witness interview with Nasser Al-Mansour (page 147), does indeed note that the King's Boeing 747 was taking off at about this time, but no further comment is made.) Busby says Saudi protocol required everything at the airport to stop moving while the King's plane was rolling, regardless of circumstances. He also says that Captain Khowyter will have known the King's plane was moving, and that "a Saudi pilot was not going to risk beheading due to the King's ire". I have some difficulties with Busby's account; for

² <http://www.scribd.com/doc/38040625/Death-of-An-Airplane-The-Appalling-Truth-About-Saudia-Airlines-Flight-163>

example, he says that even ground emergency crew could not move until the King's plane was 'wheels up', and yet we know that Flight 163 was chased down the runway by emergency vehicles, so these versions seem inconsistent.

Another explanation for the long taxiing and the delayed engine shutdown could be that the flight crew were also affected by noxious gases. However, the last transmission from the cockpit at 1840:33 ("Affirmative, we are trying to evacuate now") was one and a half minutes after the aircraft stopped moving.

Flight 163 therefore remains, at least partially, a mystery. Three hundred and one passengers and crew died in a plane that had landed successfully.

A good way of thinking about the root causes of accidents is to ask, "If I had a time machine, to what point in time would I have to travel to stop this accident happening?" The answers in this case are as follows:

This accident would have been completely avoided if dangerous flammable material had not been stowed in the aft hold.

Deaths would perhaps have been avoided completely if the Captain had turned back to Riyadh more quickly.

Deaths would perhaps have been avoided completely if the Captain had stopped the aircraft promptly on the runway and ordered emergency evacuation.

Some deaths might have been avoided if oxygen masks had been made available.

Contributory factors must include the poor calibre of the flight crew, and the Captain's failure to delegate the control of the plane to the First Officer.

The significance of the presence of King Khalid's Boeing 747 is unknown.

Also unknown is the significance of the Captain 'singing in Arabic' – was he praying when he should have been managing the crisis?

I personally empathise a little with Captain Khowyter. He was clearly not the most able of captains. He was placed under a position of extreme duress, where key decisions had to be taken promptly. He had a sub-standard flight crew who were perhaps less helpful than they should have been. Nevertheless, he was an experienced pilot who should have been able to make these key decisions. He should also have been able to delegate more effectively, and he should have fostered better relationships with his colleagues. I think he showed signs of wanting too much to be in control of everything, to the point that he seemed to resent, ignore and even countermand the helpful suggestions about preparing for evacuation made by Flight Engineer Curtis.