CAPTAINS NOT SO COURAGEOUS – PART 1

IN THE remarkable evolution of aviation since the Wright brothers first contrived to become airborne in a machine heavier than the atmosphere, man has been inspired to pursue, passionately and relentlessly, the attainment of greater safety in the air, continually producing bigger, better, more efficient and safer passenger aircraft.

The introduction of the Boeing 747 among others, into general airline service in the late 1960s and early 1970s, heralded new standards of safety.

However, even as that gigantic aircraft was taking shape on the drawing boards, designers were becoming increasingly aware that despite the fact that technology had virtually eliminated the time-honoured causes of accidents such as mechanical failure, design faults or weather, the human element was rapidly becoming the major factor in such accidents, as few and far between as they may have become.

Boeing having recognised this, therefore sought to produce an aircraft as near fool proof as the technology of the day could make it, thankfully, however, without compromising the over-riding capability of the pilot. Despite its shortcomings, the human brain, with its ability to judge, assess and anticipate, cannot be transcended by any computer.

Later, other manufacturers were to learn the folly of according so much authority to auto systems that, in fact, they actually began to over-ride the pilot! This was amply demonstrated by the tragic series of accidents to Airbus Industrie's A320, the world’s first civil 'fly by wire' or virtually fully computer controlled aircraft in the early1990s, whereby all inputs from the pilot are fed to a computer which then manipulates the control surfaces, thus eliminating the “feel” that is so important during manual control.

> ***“There was no need to shine his torch into the darkened compartment below the flight deck floor because all that he could see below were the lights of Nairobi...”***

One consequence of this is that, more than ever before, crew co-operation and cross monitoring on the flight deck became vital to safety, for as sophisticated as any auto flight system may become, like any computer, the right buttons still have to be pressed for it to function properly.

Prior to this, the early 1970s saw a reappraisal of the approach to airline pilot selection and training, following several horrendous accidents directly related to the atmosphere engendered by some captains on the flight deck.

One of the first of these to awaken this realisation, occurred in 1972 when a British European Airways’ (later to be incorporated into British Airways) three-engined Trident stalled shortly after taking off from London's Heathrow Airport to crash into the ground at Staines, tragically, with no survivors.

It subsequently emerged that during the pre-flight formalities, the highly experienced, very senior, but intractable, captain had apparently had an infernal row with his two young, relatively inexperienced, first officers, leading to an extremely strained atmosphere on the flight deck. After takeoff, inexplicably before attaining sufficient speed, the leading edge lift devices were retracted.

On large jets, such devices can reduce stalling speeds by as much as 50 knots. In this case, the result was that the rear-engined, high-tailed tri-jet entered a deep stall. This was caused by the high set elevators losing effectiveness being, as they were, in the wake turbulence behind the stalled wings due to the high nose up attitude. As subsequently demonstrated in a simulator, recovery from such a situation at that low altitude proved well nigh impossible.

In the absence of any evidence to the contrary, investigators, increasingly aware of the importance of the atmosphere prevailing on a flight deck, attributed the premature flap retraction to be directly linked to the domineering, uncompromising attitude of the captain.

It was reasoned that if he had been more cooperative and inadvertently – in the state of mind in which he might have been following the pre-departure altercation – called for flaps up, this would have been queried by a first officer who had not been intimidated.

LUCKY ESCAPES

A further example of this occurred during a Lufthansa 747 taking off from Nairobi.

Before being modified, probably as a result of this very accident, the only indication of leading edge device position was on the flight engineer's panel, the pilot's panel indicator showing only trailing edge flap position.

Once again, the atmosphere on the flight deck appeared to have been anything but cordial, and during the pre-take-off check, the flight engineer failed to notice that all the leading edge devices were not extended.

The result of this was that, although the aircraft may have briefly lifted off the tarmac, it promptly fell back and ended up off the end of the runway with surprisingly few casualties under the circumstances.

Closer to home, however, this problem, unrecognised at the time, could have manifested itself much earlier than this – in the early 1960s in fact – not many months after

the introduction of the Boeing 707, when the national airline survived two extremely lucky narrow escapes followed by two tragedies, none of which could reasonably have been attributed to anything but pilot error.

With the advent of the 707, so in awe were the authorities of this airline of the big new jet, more than twice the weight and speed of anything hitherto operated by the carrier, that they chose to crew it with not one, but two captains in addition to a senior first officer, himself highly experienced and due for command, plus a flight engineer.

The wisdom of this nose heavy crew structure was debatable and not popular with most pilots. As one of those erstwhile senior first officers, I bore mute witness to more than one altercation between captains on the flight deck.

In the first of these lucky escapes, a mere four months after the airline's first 707 route flight, details of which are repeated from conversation with the flight engineer involved shortly afterwards, it appeared that the aircraft was descending into Nairobi's Ndjili (later to become Jomo Kenyatta) airport at night. In good visibility and with a light north-easterly wind, they were cleared for a visual approach to runway 06.

In order to position for a wide, easy base leg for that runway, it was common practice to head for 'GG' beacon, situated in the notorious Ngong hills, some 15 miles west of the airport, which had seen the demise of many an ill-fated aircraft and its occupants, and which rise to 8 074 feet above sea level. This is a treacherous 1 647 feet above the airfield elevation.

After nearing 'GG', (minimum safe sector altitude 9 600 ft) the aircraft either intercept the instrument landing system or proceed with a visual approach on to the runway.

Since the approach to runway 06 is over sparsely populated terrain including a game park, there is little or no visual reference to the ground on dark nights, and the normal procedure would be to depart ‘GG’ at not less than 9 600 feet whereafter further descent would be regulated in accordance with the instrument approach procedure.

On this occasion, however, there might well have been a certain amount of complacency on the flight deck, for with the lights of the city in sight in the distance, they failed to maintain their minimum safe altitude for that sector and continued descending until one of the captains, realising the imminence of disaster, opened the throttles.

Both the captains on board had attained all their vast experience on piston engined aircraft, which might well have been of significance in this case, for in a propeller-driven aircraft, opening the throttles automatically increases lift via propeller slip stream over the wings, raises the nose and arrests descent, whereas in a jet, opening the throttles without substantially raising the nose, simply drives the aircraft down faster.

IMPACT

However that might be, they hit the ground with an impact which devastated the 'Lower 41', a compartment below the flight deck housing electronic and avionics equipment resulting in an instant and total electrical power failure which, in turn, led to loss of all electrically powered instruments, navigational aids, lights and hydraulic selection.

The crew endeavoured to keep the aircraft flying on the few limited panel instruments left to their disposal discerned in the dark by the use of torches that they all carried, and by reference to the runway lights.

The flight engineer subsequently stated that when directed to enter the 'Lower 41' by means of a hatch in the flight deck floor to assess the damage to his utter consternation, that there was no need to shine his torch into the darkened compartment because all that he could see below were the lights of Nairobi!

There followed a truly remarkable display of airmanship, for whichever captain was flying (I never discovered which of them performed the final phase), in the absence of the nose wheels and unable to lower the main gear, elected to put the machine down on the grass alongside the runway. This he achieved by nothing other than torchlight and his superb skill and resourcefulness, with the result that the only casualty was the aircraft itself and, perhaps, the dignity of whichever captain was responsible.

Although the aircraft was re-built, and flew again for many years, the left-hand seat captain who held ultimate responsibility never again flew 707s and retired flying piston-engined DC-7Bs. But the million dollar question remained unanswered: How does an experienced and highly capable crew comprising not one, but two captains in addition to a senior first officer, contrive to fly right through their minimum sector safe height into high ground which they all must have overflown countless times previously, both by day and at night?

ATHENS INCIDENT

This accident was followed, not two years later at Athens, by an equally fortuitous stroke of luck involving a similarly structured crew – two captains, the more senior of whom was in command, a senior first officer in the third

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pilot's seat and a flight engineer.

They were flying one of the original 'A' model 707s powered by straight jet Pratt & Whitney JT-4 engines, renowned for the awesome, deafening blast they emitted at take-off thrust. This led, incidentally, to the introduction of controversial and potentially hazardous noise abatement procedures at most international airports, requiring that, on reaching in the region of 1 500 feet agl, the engines be throttled back to a power just sufficient to maintain level flight at V2 speed plus 10 knots until well clear of built-up areas.

Any pilot found to have exceeded a specified number of decibels recorded at measuring points along the departure route, would be threatened with being banned from operating from that particular airport! That, however, is another story.

Initial take-off power was set on those JT-4s on a gauge registering what was known as PT7 (Pressure Total at station 7) which was simply a pressure reading just aft of the turbine, while the aircraft was static although lined up on the runway. This power was then monitored for a minute or so, allowing the engine to "grow" or expand with the heat causing tension in the control cables which necessitated re-adjusting, the throttles in order to maintain the required PT7.

The brakes were then released and the engines further monitored during the take-off roll on the exhaust gas temperatures gauges to ensure that the turbines did not "overtemp".

Before take-off, it fell to the flight engineer to extract the required PT7 for every take-off from tables which he would enter with ambient temperature and pressure altitude. This reading, together with V1, Vr, V2 speeds and various other data, would then be hand written in black on a printed yellow take-off card, which would then be placed on the radar screen where it was readily visible to both pilots.

It then fell upon the pilot in the right-hand seat to verify the data, in particular, the PT7 and the speeds, independently of the flight engineer.

On this particular take-off, however, both the co-captain and the flight engineer appeared to have made the same mistake for a PT7 much lower than that required for the prevailing conditions was entered on to the card and set for take-off. On a heavy take-off such as this, with probably a full fuel load since they were bound directly for Johannesburg from Athens, it is well nigh impossible to judge acceleration rate since this varies and initially, is agonisingly slow.

And so, having set a PT7 well below that which would have produced full thrust, they only realised past V_1 that something was amiss and that they had no hope of getting airborne before the end of the runway, whereupon one of the pilots slammed the throttles full open, enabling them to stagger into the air as they left the runway, only to be confronted by a low stone wall bordering an olive grove at the end of the clearway.

The undercarriage was then selected up but not before a section of the wall had been demolished. Miraculously, it was later discovered, this did no damage to the aircraft and they continued flying through the tops of the olive trees until, eventually, that indomitable machine built up sufficient speed to climb away!

After reducing to climb power and retracting flaps and since they could detect no damage, the captain in command inexplicably elected to continue as per schedule on the eight-and-a-half hour leg to Johannesburg, routed, in that pre-sanctions era, directly over Africa.

Remarkably, the remainder of the flight was uneventful, until, after parking, it was discovered that every orifice and cranny in the under fuselage and engine nacelles was stuffed with olive leaves and broken branches invoking a wry, "Hell, I knew these engines could run on a lot of things – but olive trees," from one of the ground engineers.

As a result of this incident, the captain in command and the flight engineer were demoted, to fly piston-engined aircraft, while the co-captain, after declining an offer to continue flying as a first officer, sought greener pastures, hopefully sans olive trees!

Once again, the inevitable question: "But how?". Was it beneath the dignity of the captain in the right-hand seat to get his nose into the books and verify the flight engineer's figures, secure in the knowledge that his colleague in the left-hand seat, there only by virtue of being slightly senior to himself, was hardly likely to take umbrage?

Or, had a senior first officer occupied that right-hand seat, would not those figures have been checked with greater diligence?

■ *The answer to this and other questions, as well as details of a number of tragic accidents, will be given in Part II- which will be published next month.*

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