

MACHEL CRASH IN PERSPECTIVE

The three-nation Commission of Enquiry into the crash in October of the Tu-134 carrying Mozambican President Samora Machel and his party from Lusaka to Maputo, is faced with what is possibly the most politically-sensitive investigation in the history of aviation. . .



By A Special Correspondent

THE CRASH of the Russian-built Tu-134 in a remote corner of South Africa on the night of October 19 which resulted in the death of Mozambique President Samora Machel and more than 30 of his top aides and Russian aircrew, will probably be recalled as being one of the more significant events in the political history of the sub-continent.

The crash sparked off a number of near-hysterical accusations by uninformed politicians in various parts of Africa and in some other Third World states which, in turn, led to anti-South African and anti-Malawian riots and demonstrations in a number of countries.

But these accusations smacked more of KGB-style disinformation propaganda than the utterances of statesmen and bore no relation to the then already-known facts of the accident. The claims that the South African Government had been involved in "luring" the aircraft to a crash were later termed to be

the "assassination of President Machel" in Zimbabwean reaction to the release by the SA Minister of Foreign Affairs, Mr Pik Botha, of documents claimed to have been found at the crash site. These documents, although dismissed by the Zimbabweans as "being a pack of lies", revealed Mozambique/Zimbabwe plans for the eventual overthrow of the present Malawi Government.

When the history books of this period are ultimately written, the cause of the political turmoil which resulted from the crash will probably be laid at the feet of a sensation-seeking reporter who either deliberately or innocently misinterpreted a statement by a shocked survivor who claimed that he had heard a loud "bang" immediately before impact.

This resulted in veiled claims — and in some of the more "popular" overseas newspapers and by some politicians, outright accusations — that the Tu-134 had been shot down and that the "bang" had been an explosion of a missile.

But the "bang" had, in fact, been caused when the wing of the presidential jet had struck and had completely sheared a metre-

thick tree trunk as the aircraft ploughed through a clump of trees on a hilltop before crashing into the top of another hill on the other side of the valley.

The flight plan route

The Tu-134 was en route from Lusaka, in Zambia, to the Mozambican capital of Maputo when the accident occurred. It was carrying President Machel and his party following a top-level meeting with the Zambian president.

The normal route followed by aircraft flying between the two capitals is well clear of South African territory. After crossing the Zambia/Zimbabwe border and coming under control of Harare ATC, the route crosses the FYLDE beacon at Hartley/Gatooma which is a reporting point and is approximately abeam Harare. At this stage, the aircraft would be on a heading of 161 degrees.

From there the advisory route is to overhead the FV beacon at Masvingo (formerly Fort Victoria) and then on a heading of 166 degrees to cross the Zimbabwe/Mozambique border/FIR boundary at Kurla.

From that point, there is a four degree right change in course to 170 degrees to the LP NDB situated at the town of Limpopo on the river of the same name near the coast of Mozambique. IFR traffic then intercepts VOR radial 035 making a 45 degree right turn on the standard instrument approach to Maputo.

But the fact that the aircraft crashed a few hundred metres into South African territory near the joint boundary of Mozambique, South Africa and Swaziland, shows that it was a long way west (to the right) of its flight-planned track.

At the time of the crash there was severe thunderstorm activity over most of the Transvaal (Jan Smuts Airport was closed for nearly two hours as a result), Swaziland and Mozambique with a number of large Cbs in the vicinity of the town of Limpopo.

Add to this fact the one that the Lima Papa beacon at the town was unserviceable on the night of the crash (and had apparently been out of order for some time) and the possible reason for the aircraft being well to the right of track becomes apparent. The crew had obviously diverted to the west to give their VIP passengers as smooth a ride as possible by avoiding the worst of the thunderstorms on track.

The aircraft was observed by radar to have been flying on a parallel course to that of the advisory route to avoid the storms which had also clearly been visible on the radar screens.

Further, the pilot of the ill-fated Tu-134 could well have been given direct clearance from either Beira FIR or Maputo ATC to fly Kurla-Maputo direct, thus avoiding the Limpopo dogsleg.

But additional information gleaned from the aircraft's three DME instruments clearly showed that it was still 34 nautical miles from Maputo when it crashed. All three DMEs, the pilot's, co-pilot's and that of the flight engineer, were jammed at 34 nm by the impact.

Press assumptions

Newspaper reporters assigned to the story obviously had to seek a possible reason for the crash, or at least why the aircraft was so far off track.

One of the earliest reports assumed that the aircraft had apparently been homing into a Mike Alpha beacon shown on some out of date navigation charts as being in the Nelspruit area. This beacon had the same coding as the Maputo NDB (MA) and was on a frequency of 350 kHz, only 40 kHz difference from the 310 kHz

frequency of that in Maputo.

This added to another assumption that one of the three or four ADFs in the Tu-134 (it is not clear just how many of these aids the aircraft had, nor of their serviceability) had been tuned to the Namaacha beacon (NM, frequency 295) which is situated just inside the Mozambique border at the point where the three national borders meet, was used by the press to explain the possible cause for the pilot thinking he was on final approach to Maputo. It was also suggested in reports that the pilot thought that the lights of Komatipoort were those of Maputo.

What the authors of these reports failed to realise is that the MA beacon at Nelspruit was destroyed by fire over two years ago and was later replaced by the NS beacon. The MA beacon had been installed at Nelspruit many years ago by Magnum Airlines (hence the coding) when it introduced its Johannesburg-Nelspruit services. It was a private beacon. Therefore, the case for mistaken identity of beacons can be ruled out.

Further, the Namaacha beacon is on a time switch and automatically goes off the air at 20h00 hours, or nearly an hour-and-a-half before the jet was in the area.

Landing approach

It is a known fact — from statements already made by the survivors of the crash — that the captain of the Tu-134 was preparing to land at what he thought to be Maputo.

The Mozambican authorities have already admitted that the pilot had called Maputo control five minutes from his estimated touchdown time to advise ATC of his approach. In fact, at that stage he was more than 15 minutes flying time from Maputo.

The pilot, according to survivors, had advised passengers of his approach to land and had requested them to prepare for landing by returning to their seats and fastening their safety belts. He is then reported to have switched off the cabin lights — standard procedure in preparing to land at night.

Seconds later the aircraft ploughed through the clump of trees and a loud bang was heard — the wing striking the metre-thick tree. The aircraft, judging from the trail of wreckage, had then crossed a shallow valley to crash and break up on the following hill.

The puzzle

There are many questions to be answered in the investigation into the crash which is being conducted by the South African, Mozambican and Russian authorities. Some may well be answered when the flight and cockpit voice recorders, the so-called "black boxes" are finally decoded.

Among the questions to be resolved are:

● **VDF BEARING CHECK.** If, as the Mozambique ATC claims, the aircraft called for landing instructions and was therefore obviously within VHF range, why was not the aircraft's bearing checked by ATC on the VDF equipment? Had this been done, then the controller should have realised that the aircraft was well to the west of Maputo and advised the pilot accordingly.

● **USE OF VOR/ILS EQUIPMENT.** If, as can rightly be assumed, the aircraft's ADFs were being affected by the thunderstorm activity in the area, why was no proper use being made of the VHF navigation facilities at Maputo such as the VOR/ILS? Was this equipment, in fact, serviceable that fateful night and, if it was, what was the serviceability state of the aircraft's instruments and avionics?

A late report from Maputo as this edition was going to press, disclosed that a number of the ATC staff there had been arrested after it was found that certain radio navigational equipment at the airport had allegedly not been switched on on the night of the crash. This report was subsequently denied by the Mozambique authorities.

If both the ground and airborne equipment were serviceable, why was the information supplied by the equipment not used by the pilots in planning the approach? Had the VOR bearings been correctly interpreted by the pilot(s), they would have indicated an extreme "west of track" situation. To date, no official statement on this has been made by the authorities in Maputo.

● **THE DME POSER.** All three DMEs on board the Tu-134, the pilot's, co-pilot's and that at the flight engineer's station, were jammed at 34 nautical miles by the impact. This is the exact geographical distance of the crash site from the DME facility at Maputo Airport. When then did the pilot, obviously knowing his distance out from the airport, elect to descend below the approved minimum safe approach height for Maputo, which is clearly marked on all charts?

Even in good weather at night, few pilots would descend below this height at that

*New information
which came to light last
month and which was
gleaned from the aircraft's
three DME instruments,
has strengthened the
argument that pilot
error was the
possible cause. . .*

distance, and it must be borne in mind that the point at which the jet started its descent must have been much further out than 34 miles.

With the VOR/ILS equipment serviceability in either or both the aircraft and ground station, being in some doubt; with the ADFs being affected by thunderstorms, and taking into account the poor weather and visibility conditions at the time, the fact that a descent was initiated so far out to a point below the minimum safe approach altitude, illustrates that a major error in airmanship or judgement was possibly made in the cockpit.

Had the aircraft remained above that height, the accident would not have occurred as the approach height is governed by the very hills into which the aircraft crashed.

● **THE AIRCREW.** Who was actually flying the aircraft at the time of the accident? The Russian crew member who survived the crash and who later underwent intensive care hospitalisation in South Africa before being returned to Mozambique, was at first reported to have been the pilot. He is also reported to have claimed to have been flying the aircraft at the time. Later statements originating in Maputo claimed he was, in fact, a flight engineer. If this is the case, and bearing in mind his claim, why was he flying the aircraft? An even later statement from Moscow referred to him as being the pilot and that he was at home in Russia, but suffering from amnesia.

● **ALCOHOL.** Postmortem examinations of the

bodies of other crew members revealed that there was alcohol present in their blood. Why?

● **THE FATEFUL APPROACH.** With his ADFs obviously being badly affected by thunderstorm activity and possibly getting no satisfactory readings from his VHF-related avionics, or preferring to ignore the readings of his instruments, what had caused the pilot to think he was in the immediate vicinity of Maputo to the extent that he began his final approach to a non-existing runway?

(The claims by some politicians that South Africa had used a mobile beacon to lure the jet to disaster are so ludicrous as not to even be worth considering here. There were just too many factors against such action, not the least being the weather and the DME readings).

The investigation.

South Africa, finding itself unwittingly in the midst of a major international crisis as a result of the crash, has perforce to play its cards very carefully, and the men it has appointed to the Commission of Enquiry are internationally-renowned aviation experts.

They are headed by Mr Justice Cecil Margo who, apart from being a highly-decorated World War II pilot, and who has subsequently been actively involved in aviation, earlier this decade headed the much-publicised Commission of Enquiry into Civil Aviation in Southern Africa.

As this edition was going to press, Mr Justice Margo announced the names of three top international experts who had agreed to serve on the commission. They are American astronaut, former Apollo 8 commander and test pilot, Colonel Frank Borman; a former Lord Justice of Appeal in the UK, Sir Edward Eveleigh, and Mr Geoffrey Wilkinson, CBE, a retired chief inspector of accidents in the British Ministry of Transport.

Both Russian and Mozambican delegates will also sit on the commission into the investigation of the crash. At the time of writing, no decision had yet been taken regarding the "black boxes". These have been sealed and, at South Africa's insistence, will not be opened and decoded until a panel of impartial experts can be present.

This is understandable in view of the accusations which have been levied at the country. It is in South Africa's interests to ensure that the evidence supplied by the recorders cannot be tampered with for political or other motives.

The investigation is likely to take many months of painstaking sifting of evidence and, by insisting on Russian and Mozambican representation on the commission, the South Africans are ensuring that the truth will ultimately be told.

Without in any way endeavouring to presuppose the findings of the Commission of Enquiry, many aviation experts are of the opinion that the crash was probably caused by severe weather conditions related to an error or series of errors made in the cockpit that fateful night.

It resulted in a crash which rocked the already shaky political stability of the sub-continent and, whatever the outcome of the investigation, is likely to have far-reaching effects on the area as a whole.

It is to be hoped that the unnecessary hysteria which resulted from the crash will cease while the world awaits the outcome of the investigation. One thing is sure, though, that ultimately when the commission members put their signatures to the report at the end of the investigation, it will probably be one of the most important actions of their lives.

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