

THE DESTRUCTION OF KAL007 *

At [1984] Australian I.L. News 36 we included a note on this unfortunate incident. Since then, the Report of ICAO Fact Finding Investigation, Destruction of Korean Air Lines Boeing 747 over the sea of Japan, 31 August 1983, Montreal, December 1983, has come to hand.

The Report was referred to the Air Navigation Commission of ICAO for technical review. Once this technical review came to hand, the ICAO Council took final action by way of a resolution on 6 March 1984. An Extraordinary Session of the ICAO Assembly has been called for 24 April 1984 to consider, inter alia, amendments to the Convention on International Civil Aviation proposed by France, Austria and the USSR. In this note the following will be briefly discussed: first, the Report, then the ICAO Resolution of 6 March 1984 and finally, the Extraordinary Session.

1. The ICAO Report, December 1983:

The Report summarises the history of the incident in these words:-

On 31 August 1983, a Korean Air Lines Boeing 747, designated KE007, departed John F. Kennedy International Airport, New York, United States, on a one-stop scheduled flight to Kimpo International Airport, Seoul, Republic of Korea. The en-route stop occurred at Anchorage International Airport, Alaska, United States. At Anchorage, the aircraft was refuelled, serviced for the remainder of the flight to Seoul, and, in accordance with the standing company practice, the flight and cabin crews were changed.

The flight departed at the planned estimated time of departure (ETD) which, in keeping with the standard Korean Air Lines' procedure, was separately calculated for each flight of KE007. The ETD at Anchorage was planned so that its arrival in Seoul was at its scheduled arrival time of 0600 (local time) or as close thereto as possible. The actual departure time of 1300 hours on 31 August should have resulted in an on-time arrival of KE007 at Seoul had the flight been completed successfully and fully in accordance with its filed flight plan.

On departing Anchorage, the flight had 269 persons on board consisting of three flight crew members, twenty cabin attendants, six crew employees of KAL being repositioned to Seoul for duty assignments and 240 passengers.

Soon after its departure from Anchorage, KE007 began deviating to the right (north) of its assigned direct route to Bethel. This deviation resulted in a progressively ever greater lateral displacement to the right of its planned route which, ultimately, resulted in its penetration of adjacent high seas airspace in flight information regions (FIRs) operated by the Union of Soviet Socialist Republics (USSR), as well as of sovereign USSR airspace overlying portions of the Kamchatka Peninsula and Sakhalin Island and their surrounding territorial waters.

No evidence was found during the investigation to indicate that the flight crew of KE007 was, at any time, aware of the flight's deviation from its planned route in spite of the fact that it continued along the same general off-track flight path for some five hours and twenty-six minutes.

* [This is a summary of the Report of and subsequent action by the International Civil Aviation Organization cited above.

Reference should also be made to (1983) 22 ILM 1109 where further documents are published.]

At about 1820 hours when it was in the vicinity of Sakhalin Island, USSR, the flight was intercepted by military aircraft operated by the USSR. At 1827 hours, the aircraft was hit by at least one of two air-to-air missiles fired from one of the USSR interceptor aircraft whose pilot had been directed by his ground command and control unit to terminate the flight of KE007.

As a direct result of the missile attack, KE007 crashed and sank into the Sea of Japan southwest of Sakhalin Island. There were no survivors among the passengers, flight crew and cabin attendants. Only fragmentary pieces of the aircraft and a small number of items of personal property have been salvaged to-date. Most of this debris apparently was either dislodged as a result of impact forces at the time the aircraft struck the water or subsequently floated to the surface where they were dispersed by tidal currents.

The search and rescue and salvage efforts of the several interested ICAO Contracting States have now been suspended or terminated completely after more than two months of sustained effort.

The report says that due to the absence or unavailability of:

- (1) surviving crew members with whom discussions might have taken place;
- (2) some of the communications which might have shed light on the reasons for KE007's major course deviation;
- (3) indications of flight crew awareness of their being off track;
- (4) indication that the crew of KE007 knew they were the subject of interception activity;
- (5) a record of communications emanating from ground intercept control units;
- (6) vital flight instrumentation, communications and avionics equipment from the wreckage of KE007 and, finally;
- (7) the flight data and the cockpit voice recorders from KE007,

the investigative effort was compelled to proceed on the basis of limited hard evidence and facts, circumstantial evidence, assumptions and calculations and to base some of its key findings on postulated and then simulated, most-likely scenarios of what may have transpired.

Several potentialities for KE007's straying off track were ultimately discarded by the ICAO investigation as being too unlikely to warrant further consideration. They are:-

- (a) unlawful interference;
- (b) crew incapacitation;
- (c) deliberate crew action associated with fuel savings incentives; and
- (d) extensive cockpit avionics/navigation systems failures or malfunctions.

As the investigation proceeded, the investigation considered many postulations as to how and why KE007 strayed so far off track. It narrowed the number of plausible explanations to three, each of which were amenable to study, analysis, testing and verification through simulation or sophisticated calculation methodologies. They were:-

- 1) That the crew inadvertantly flew virtually the entire flight on a constant magnetic heading (in the "heading mode") due to its unawareness of the fact that "heading" had been selected as the mode of navigation rather than "inertial navigation system" (INS). In such a situation, with the INS system activated although not controlling flight navigation, the crew would have been provided with regular indications of INS waypoint passages at or near the flight plan estimates for such passages and could, therefore, have been under the impression they were navigating in the INS mode.
- 2) That an undetected 10 degree longitudinal error was made in inserting the "present position" co-ordinates of the Anchorage gate position into one or more of the INS units on board the aircraft. Such an entry mistake could be made by a single "finger error" in entering more than 100 digits and letters that would be needed to fully load a single INS unit at the outset of the flight.
- 3) That at some point a crew member inserted the Seoul (destination) co-ordinates into the INS steering unit as a waypoint merely to obtain an indication of the direct distance to Seoul. In so doing, rather than using the "remote ranging" capability of the INS, he erroneously entered the present position to Seoul as a directed track change. Such an inadvertent action would produce the information desired but also cause the aircraft to take up the direct, great circle track to Seoul bypassing all other waypoints which, in the early stages of the flight would result in a change in heading, which would easily remain undetected.

After a simulation study which included four flights, three of which were of four to five and one half hours in duration, the investigation concluded that the scenarios in 1) and 2) presented possible explanations for the straying to the right of track by KE007 virtually from the beginning of its ill-fated flight. Each of the scenarios assumes a considerable degree of lack of alertness and attentiveness on the part of the entire flight crew but not to a degree that is unknown in international civil aviation, according to the Report.

The Report finds that interceptions were attempted by the USSR aircraft over Kamchatka Peninsula and in the vicinity of Sakhalin

island. The question of the identification of the Korean aircraft is important particularly if the view is adopted that there is no justification in ever shooting down a civil airliner identifiable as such on a scheduled flight. The question is still important if this view is not accepted; it is universally agreed that different rules apply to civil airliners than to military aircraft. Identification is then important if mistake is in effect being advanced as a defence. Alternatively, identification is equally important if it is alleged that KAL007 was not in reality a civil airliner in that it lost its status as such because of involvement in military operations. On the question of identification, the Report makes the following observations:-

2.11 Identification

2.11.1 Radar equipped Soviet air defense units detected an unidentified aircraft flying within FIR Petropavlovsk-Kamchatskiy on a course that would lead to its penetration of Soviet territorial and sovereign airspace over Kamchatka Peninsula. These radar stations did not have SSR information to assist in the identification of the radar blip. Identification of an aircraft on the basis of a primary radar echo, in the absence of two-way communications with all aircraft in the area concerned, was normally possible through correlation of the radar echo with available flight plan and flight progress information. No such information on KAL007 was available to the air defense stations. Even if flight plan or flight progress information had been available, its correlation with the radar blip would have been problematic since the aircraft's reported progress was along route R20.

2.11.2 According to information provided by the Soviet Air Defense Force (PAD), a United States military RC-135 reconnaissance aircraft was flying in the area southeast of Karaginshi Island to the east of Kamchatka. At 1631 hours the blip of a second aircraft came close to the RC-135 and their blips merged for about ten minutes. Although no details were available concerning the radar's resolution capability, i.e. the minimum distance needed between aircraft to display separate blips, the merging of the radar blips implied that the second aircraft flew within lateral proximity to the RC-135. Subsequently, one of these two aircraft headed for Alaska and the other in the direction of Petropavlovsk-Kamchatskiy. The area command of the anti-aircraft defense forces concluded that a reconnaissance aircraft had flown to the USSR state border.

2.11.3 United States' authorities confirmed that an RC-135 reconnaissance aircraft had been in the general area but that the two aircraft were never closer than 75 NM laterally.

2.11.4 No evidence was available to either support or refute the contradictory information from the USSR and the United States concerning the proximity of KAL007 and the reconnaissance aircraft.

2.11.5 It was conceivable that the presence of an RC-135 aircraft in the area east of Kamchatka Peninsula shortly before KAL007 penetrated Soviet airspace contributed to the Soviet air defense forces' belief that the unidentified radar echo was that of a foreign military reconnaissance aircraft. In these circumstances, procedures concerning co-ordination with ATS units in ICAO Annex 11, 2.14.3.2 were not applied by the USSR military units. These procedures called for advice to be given to ATS units in the event that a military unit observed that an aircraft which, was, or was believed to be, a civil aircraft was approaching, or had entered, an area in which interception might become necessary. Such advice was to include any necessary corrective action to avoid the necessity for interception.

The related issue is the standard of interception made by the USSR authorities. The Report concludes that they assumed the KAL007 was an "intelligence" aircraft and therefore the USSR authorities did not make exhaustive efforts to identify the aircraft through in-flight visual observations. No assistance, however, was given by the USSR authorities in providing radar recordings, recorded communications, transcripts etc. That part of the report dealing with interception follows:-

2.12 Interception

2.12.1 In accordance with the ICAO Council's special recommendations in ICAO Annex 2, Attachment A, interception of civil aircraft should be avoided and should be undertaken only as a last resort. Furthermore, an interception should be limited to determining the identity of the aircraft and providing any navigational guidance necessary for the safe conduct of the flight. To eliminate or reduce the need for interception of civil aircraft, all possible efforts should be made by intercept control units to secure identification of any aircraft which may be a civil aircraft, and to issue any necessary instructions or advice to such aircraft, through the appropriate ATS unit.

2.12.2 When overflying Kamchatka Peninsula, KE007 was intercepted by fighter aircraft of the USSR Air Defense Command for the purpose of identifying and compelling the aircraft to land at an aerodrome in USSR territory in accordance with the laws of the USSR. The interim report from the Soviet Accident Investigation Commission stated:

"The intruder aircraft was flying with its navigation and strobe lights switched off and the cabin lights extinguished. The Air Defence fighters flew up to the aeroplane, flashed their lights on and off and rocked their wings. The aeroplane did not react to the fighter signals or the interrogations transmitted on the international emergency frequency of 121.5 MHz from both the ground and the air, but continued its flight and departed in the direction of the Sea of Okhotsk."

2.12.3 Communications during this time from KE007 to Anchorage Radio and to KED15 indicated a routine operation. There was no indication that the pilot was aware of being intercepted.

2.12.4 Interception procedures and signals for use in the event of interception were promulgated in the AIP USSR. These procedures and signals were generally in line with the interception procedures in ICAO Annex 2. Differences notified by the USSR indicated that interception phraseology in Annex 2, paragraph 3.8.2 was not used and that signals series 5 and 6 in Annex 2, Appendix 2 signifying inability to comply or distress were not used.

2.12.5 Information concerning a second interception, in the vicinity of Sakhalin Island, as contained in the preliminary report of the Soviet Accident Investigation Commission was as follows:

"The second interception took place in the vicinity of Sakhalin Island. The intruder aeroplane was still flying with its navigation and strobe lights switched off and the cabin lights extinguished. Interception procedures were initiated at 2216 Moscow time on 31 August 1983*

(0616 local time on 1 September 1983) when the intruder aeroplane crossed the State frontier. During the interception the intercepting aircraft flashed its lights repeatedly and rocked its wings to attract the attention of the intruder aircraft's crew. At the same time the interceptor endeavoured to establish radiocommunication on the emergency frequency 121.5 MHz.

The intruder aeroplane did not respond to the actions of the interceptor.

On the order of the ground control unit the interceptor, in addition to the procedures already described, fired four warning bursts of tracer shells from its guns at 2220 Moscow time on 31 August 1983** (0620 Sakhalin time on 1 September 1983). Altogether 120 shells were fired. The intruder aircraft did not react to this action either.

Having concluded that the unknown intruder aeroplane was an intelligence aircraft, the Area Air Defence Command decided to terminate its flight. On instructions from the ground control unit the pilot of the SU-26 interceptor launched two rockets at the intruder aeroplane at 2224 Moscow time on 31 August 1983*** (0624 Sakhalin time on 1 September 1983) over the territory of the USSR and turned back to its base aerodrome."

2.12.6 Information concerning the second interception and the destruction of flight KE007 also was available from another source, the Defense Agency of Japan, in the form of monitored air-to-ground communications from USSR interceptor aircraft and radar information showing the track of KE007 and three of the interceptor aircraft. The radar information included radar data concerning the track and altitude of KE007 between 1812 and 1829 hours when it was in the vicinity of Sakhalin Island (USSR). The information was derived from the self-defense force radar at Wakkanai. The first position of the aircraft was approximately 47° 40'N 143° 45'E, at 32 000 ft and squawking SSR code 1300. The radar blips moved southwesterly, crossed Sakhalin Island and disappeared at 30 000 ft at a point approximately 20 NM off the coast of Sakhalin Island. Three other radar tracks were observed in the vicinity of KE007. The monitored air-to-ground communications, as translated into English, corresponded closely to the translation presented by the United States' Representative to the United Nations, in co-operation with the Government of Japan, before the United Nations Security Council on 6 September 1983.

** 1320 hours GMT

*** 1324 hours GMT

2. ICAO Resolution of 6 March 1984:

The Council of the ICAO debated the Report referred to above, and at the close of the debate on 6 March 1984 adopted the resolution set out below.

The Council in reaching its decision had before it not only the report by the Secretary General on the facts and technical aspects relating to the flight and destruction of the aircraft but the technical comments by the Air Navigation Commission (ANC), as part of its ongoing study of appropriate annexes and documents related to interception of civil aircraft. This study has resulted in a series of safety recommendations and proposed amendments to the relevant annexes which will be referred to the Council for action after they have been reviewed by States. The resolution was in these terms.

THE COUNCIL,

- 1) RECALLING the resolutions adopted and the decisions taken on 16 September 1983 at the Extraordinary Session of the ICAO Council and endorsed by the 24th Session of the ICAO Assembly in October 1983 as well as the Council Resolution of 13 December 1983, relating to the destruction of a Korean Air Lines civil aircraft on 1 September 1983 by Soviet military aircraft;
 - 2) HAVING CONSIDERED the report of the investigation by the Secretary General and the subsequent technical review by the Air Navigation Commission;
 - 3) RECOGNIZING that, although this investigation was unable, because of lack of necessary data, to determine conclusively the precise cause for the serious deviation of some 500 kilometers from its flight plan route by the Korean aircraft into the airspace above the territory under the sovereignty of the Soviet Union, no evidence was found to indicate that the deviation was premeditated or that the crew was at any time aware of the flight's deviation;
 - 4) REAFFIRMING that, whatever the circumstances which, according to the Secretary General's report, may have caused the aircraft to stray off its flight plan route, such use of armed force constitutes a violation of international law, and invokes generally recognized legal consequences;
 - 5) RECOGNIZING that such use of armed force is a grave threat to the safety of international civil aviation, and is incompatible with the norms governing international behavior and with the rules, Standards and Recommended Practices enshrined in the Chicago Convention and its Annexes and with elementary consideration of humanity;
 - 6) EXPRESSING its continuing sympathy with the families bereaved in this tragic incident;
- 1) CONDEMNS the use of armed force which resulted in the destruction of the Korean airliner and the tragic loss of 269 lives;
 - 2) DEEPLY DEPLORES the Soviet failure to cooperate in the search and rescue efforts of other involved States and the Soviet failure to cooperate with the ICAO investigation of the incident by refusing to accept the visit of the investigation team appointed by the Secretary General and by failing so far to provide the Secretary General with information relevant to the investigation;
 - 3) URGES all Contracting States to cooperate fully in the work of examining and adopting an amendment to the Chicago Convention at the 25th Session (Extraordinary) of the ICAO Assembly and in the improvement of measures for preventing a recurrence of this type of tragedy.

The conclusions in the Report are:

3. CONCLUSIONS

- a) The flight crew was properly certificated and qualified for the flight.
- b) Nothing in the investigation indicated that the flight crew was not physically or psychologically fit.
- c) The aircraft was properly certificated and had been maintained in accordance with approved procedures. The aircraft was serviceable when dispatched from Anchorage.
- d) There was no indication of a major failure in the equipment of the aircraft, inter alia, the navigation system and the weather radar.
- e) The flight departed at the planned estimated time of departure (ETD) which, in keeping with the standard Korean Air Lines' procedure, was separately calculated for each flight of KE007. The ETD at Anchorage was planned so that its arrival in Seoul would be at its scheduled arrival time of 0600 (local time) or as close thereto as possible. The actual departure time of 1300 hours on 31 August should have resulted in an on-time arrival at Seoul. Therefore, the investigation did not consider further a deliberate delay in KE007's departure from Anchorage and a premeditated deviation from the flight plan route for intelligence gathering purposes.
- f) Soon after its departure from Anchorage, KE007 began gradually deviating to the north of its assigned direct route to Bethel. Within ATC radar coverage, it did not significantly deviate from its assigned route and the crew was not advised of its minor deviation. This deviation resulted in a progressively ever greater lateral displacement to the right of its planned route which, ultimately, resulted in its penetration of adjacent high seas airspace in flight information regions operated by the USSR, as well as of sovereign USSR airspace overlying portions of the Kamchatka Peninsula and Sakhalin Island and their surrounding territorial waters.
- g) No evidence was found during the investigation to indicate that the flight crew of KE007 was, at any time, aware of the flight's deviation from its planned route in spite of the fact that it continued along the same general off-track flight path for some five hours and twenty-six minutes.
- h) There was no agreement between the United States' military authorities and the FAA concerning routine monitoring of civil traffic on the NOPAC composite route structure. Had the military radar at Shemya been used to monitor KE007's progress, the mere absence of its radar response would have been grounds for corrective action.
- i) Deliberate short cutting of the routes was not possible without either flying through FIRs of the USSR where such flights would be observed or without later being observed by radars in Japan. There were no records of any such deviations.
- j) Interceptions of KE007 were attempted by USSR military interceptor aircraft over Kamchatka Peninsula and in the vicinity of Sakhalin Island.
- k) The USSR authorities assumed that KE007 was an intelligence aircraft and, therefore, did not make exhaustive efforts to identify the aircraft through in-flight visual observations.
- l) KE007's climb from FL 330 to FL 350 during the time of the last interception, a few minutes before its flight was terminated, was interpreted as being an evasive action thus further supporting the presumption that it was an intelligence aircraft.
- m) There was no indication that the flight crew of KE007 was aware of the two interception attempts.
- n) At 1827 hours, the aircraft was hit by at least one of two air-to-air missiles fired from one of the USSR interceptor aircraft whose pilot had been directed by his ground command and control unit to terminate the flight of KE007. The aircraft was subsequently destroyed on its impact with the sea.
- o) Nothing in the last radio transmission suggested that the flight crew was aware of the reason for a rapid decompression.
- p) It was possible to postulate that either the holding of a constant magnetic heading (246°) or an undetected error of 10 degrees east in longitude made in the insertion of the present (ramp) position into one of the three INR units, would have produced a track to the area of KE007's destruction that was also consistent with the radar track information provided by the USSR and by Japan. Each of those postulations assumed a considerable degree of lack of alertness and attentiveness on the part of the entire flight crew but not to a degree that was unknown in international civil aviation.

3. The Extraordinary Session called for 24 April 1984:

The Council of ICAO has decided to hold an Extraordinary Session of the Assembly of 151 Contracting States on 24 April 1984, to consider a proposed amendment to the Convention on International Civil Aviation involving an undertaking to abstain from the use of force against civil aircraft. The decision to hold this Extraordinary Session of the Assembly for a maximum period of three weeks is pursuant to a Resolution of the Extraordinary Session of the Council on 15-16 September 1983 at the request of the Republic of Korea and Canada to consider the tragic incident on 1 September of Korean Air Lines, flight 007. In its News Release P10 20/83, ICAO stated:-

In preparing for this Extraordinary Session of the Assembly, the Council will have before it specific proposals already submitted by France, Austria and the Union of Soviet Socialist Republics. The draft amendment presented by France provides that "All Contracting States undertake to abstain from resorting to the use of force against civil aircraft subject to the provisions of the Charter of the United Nations and, in particular, Article 51 thereof concerning the exercise of the right of individual or collective self-defence."

The proposal presented by Austria specifies, among others, that "if a Contracting State is entitled to require the landing of an aircraft and if such landing is not effected", that measures taken "shall not endanger the life and safety of the persons aboard the aircraft concerned".

The USSR proposes to refine and expand the provisions in the Preamble to the Chicago Convention of 1944 and Article 4 of the Convention according to which "Each Contracting State agrees not to use civil aviation for any purpose inconsistent with the aims of this Convention".

In related matters, the Air Navigation Commission is currently considering a series of proposed amendments to the Annexes of the Chicago Convention relevant to the interception of civil aircraft. This also follows action by the Extraordinary Session of the Council for a review of rules and procedures to improve the co-ordination of communication systems between military and civil aircraft and air traffic control services and procedures involving the identification and interception of civil aircraft.

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