

PRESS RELEASE

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Press Release regarding the report of Dutch Safety Board ...

The final report for the accident that TC-JGE registered Turkish Airlines aircraft suffered prior to its landing while performing the TK1951 Istanbul-Amsterdam flight on Wednesday, February 25, 2009, has been released by the Dutch Safety Board.

The purpose in these type of reports is to identify how the event has occurred and to determine what can be done to prevent it from happening again. Turkish Airlines has reviewed the report and, in respect for the public interest in this accident, provides the following comments on the report:

The aircraft had two radio altimeter systems to measure its vertical distance from the ground. During the approach of TC-JGE aircraft into Amsterdam Schiphol Airport's runway 18R, the right-hand radio altimeter system used by the First Officer, who was flying the aircraft, was performing normally, while the left-hand system showed an incorrect altitude of -8ft. The aircraft was designed so that the autothrottle system, which is the part of autoflight system that controls the speed of aircraft by altering engine power, receives the data on ground proximity only from the left-hand radio altimeter system without any comparison with the right-hand system's data, and the autothrottle system accepted the left-hand system's incorrect altitude information as an indication that the aircraft was at the touchdown stage of landing. The autothrottle system reduced the engine power, causing the aircraft speed to go below the minimum speed needed to keep the aircraft controllable in the air (the stall speed), and the resulting loss of control of the aircraft occurred at an altitude too close to the ground for recovery. This error-prone relationship between the autothrottle and left-hand radio altimeter system had not been previously explained in the aircraft manufacturer's documentation for the flight crews; this was described in an update only after this accident.

Because Amsterdam Air Traffic Control brought the aircraft in with a shorter -than -normal approach route, the aircraft was flying higher and faster than usual. Due to this attitude and speed, it was to be expected that the thrust levers would go to the idle position to reduce engine power as the aircraft was slowing down and descending to reach normal approach speeds and altitudes. This appropriate expectation prevented the system error from being realized in time. As the speed approached the required minimum controllable speed, aural and visual warning systems were activated, and the crew immediately initiated steps to recover control of the aircraft. But the prompt advancement of the thrust levers by the flight crew was initially counteracted by the autothrottle system, which retarded the thrust levers again. The crew disengaged the autothrottle and advanced the thrust levers again, but the loss of time due to this system behavior in close proximity to the ground resulted in the recovery efforts being unsuccessful. The aircraft manufacturer's

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documents had previously advised the pilots of the need to advance the thrust levers immediately, but the documents had not mentioned the need to disconnect the autothrottle system during such a recovery.

Listed below are some of the aspects included in the report:

1) THY Teknik AŞ (Turkish Technic) had identified incorrect radio altimeter outputs in the THY B737-800 fleet long before the accident, and it had conducted studies regarding these outputs. In numerous communications, it brought these incorrect outputs to the attention of the aircraft manufacturer and the radio altimeter antenna manufacturer. Neither took sufficient steps to address these outputs. These incorrect outputs were also raised by Turkish Technic with the aircraft manufacturer via its official internet portal, which led numerous other B737-800 operators to share online that they were having similar radio altimeter problems, but the topic was removed from the forum without the problems having been resolved.

2) The report states that the aircraft manufacturer had failed to see these incorrect altimeter outputs, which were observed in numerous B737-800 aircraft, as a serious flight safety problem. But it is a remarkable fact that the B737-800 aircraft manufactured after 2006 were equipped with a system that does compare the left-hand and right-hand radio altimeter data and informs the flight crew when there is a difference between the two. The report indicates that the aircraft manufacturer, as well as the American Federal Aviation Administration, which provided the certification for the relevant aircraft, failed to attach proper significance to addressing the design problem that led to the incorrect altimeter outputs on earlier B737-800 aircraft such as the accident aircraft.

3) According to the Dutch Air Traffic regulations, an aircraft performing an instrument approach to Amsterdam Schiphol's runway 18R should be aligned with the runway extension at least 8 nautical miles before the runway threshold at a height of 2000ft. Despite this, to increase the flow of traffic, air traffic controllers often use their discretion to bring the aircraft into alignment as close as 5 nautical miles. The report states that this practice requires an aircraft to fly higher and faster than would be required for a properly aligned approach and increases the workload of the flight crew in the critical final approach phase. The report therefore evaluates this practice of the air traffic controllers as unsafe.

4) This air traffic control practice caused the aircraft to end up with more energy than required for its location in relationship to the runway threshold, and the autothrottle system kept the thrust levers in the idle position to reduce the airspeed to the required final approach speed. As the approach speed properly selected by the pilot on the automatic flight system was reached, the incorrect radio altimeter value prevented the autothrottle system from advancing the thrust levers to maintain that speed, and the speed began to decrease even more rapidly.

At an altitude of approximately 460ft, the aural and visual warning systems gave warning that the aircraft was entering an uncontrollable state (i.e., stall), and the flight

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crew promptly reacted and initiated the recovery steps. Thrust levers were advanced, and the control column was operated to recover control. But the aircraft was designed so that the autothrottle system would continue to use the incorrect radio altimeter data and would retard the thrust levers back to idle. The flight crew, realizing this, deactivated the autothrottle system and advanced the thrust levers again. The report notes that the aircraft manufacturer's emergency procedures documentation did not include an item that calls for deactivation of the autothrottle during a stall recovery maneuver.

5) Simulator tests carried out after this event show that an altitude of at least 500ft is required for B737-800 aircraft to recover from stall. According to the report, stall warning was received at an altitude of about 460ft and, as a result of the above evaluation, stall was unrecoverable.

In light of the information revealed in the accident investigation, Turkish Airlines have informed all its B737-800 pilots how the aircraft's error-prone design can result in the autothrottle using incorrect radio altimeter data. Turkish Airlines have also trained these pilots in the simulator in stall-recovery techniques at low altitudes.

In the report released by the DSB there are also certain aspects Turkish Airlines disagree with, principal two of which are listed below:

- a) Approach stabilization is not a factor in the causation of this accident.
- b) It is claimed by the report that the crew could have recovered the aircraft after the stall warning was received. However, even though the crew promptly reacted, autothrottle kicked back unexpectedly. The second attempt by the crew, after disengaging the autothrottle, to advance thrust levers was successful but too late.

Turkish Airlines remains in keeping with its flight operations safe and in accordance with both national and international regulations as indicated in the report.

The released report will be analyzed in more detail by all relevant departments of Turkish Airlines, and a second press release will be distributed if necessary.

Once again, we offer our deepest sympathies and condolences to the families and friends of the passengers and crew we lost in this unfortunate accident.

Turkish Airlines, Inc
Media Relations