



Another Look at

SMOLENSK

BY MARK LACAGNINA

Polish report says that a radar malfunction was involved in the Tu-154 crash.

Erroneous on-track, on-glide-path callouts by an air traffic controller during a radar-assisted nonprecision approach likely encouraged the flight crew to continue the approach despite the presence of thick fog, according to an independent report by Polish authorities on the April 10, 2010, crash of a Tupolev 154M at Smolensk, Russia.

The report by the Polish Committee for Investigation of National Aviation Accidents said

that the Tu-154 was not within flight-path deviation limits and concluded that the controller's guidance errors were caused by a malfunction or mistuning of the radar system at Smolensk Severny Airdrome.

The aircraft struck terrain short of the runway, killing all 96 people aboard.

Similar to the report published last year by the Interstate Aviation Committee (IAC), the Polish committee's report primarily faults the flight crew

for the accident, saying, “The immediate cause of the accident was the descent below the minimum descent altitude at an excessive rate of descent in weather conditions which prevented visual contact with the ground, as well as a delayed execution of the go-around procedure.”

The IAC report said that the immediate cause of the accident was the flight crew’s failure to proceed to an alternate airport after being told repeatedly that the weather conditions at Smolensk were significantly lower than the nonprecision approach minimums (ASW, 2/11, p. 20).

The findings of the investigation committees appear to differ mainly in the extent to which air traffic control (ATC) and the presence on the flight deck of the commander-in-chief (CIC) of the Polish air force contributed to the accident. Compared to the IAC report, the 328-page Polish report gives greater weight to the former and less to the latter. It provides the following details about the accident flight:

The Tu-154 and a Yakovlev 40 operated by the 36th Special Airlift Regiment of the Polish air force were assigned to transport VIPs to Smolensk for a commemoration of the 70th anniversary of the Katyn Massacre during World War II.

Weather conditions at Smolensk deteriorated rapidly after the aircraft departed from Warsaw. The crew of the Yak-40, which was about 20 minutes ahead, was able to land at Smolensk but later told the Tu-154 crew that visibility had decreased to 400 m (1/4 mi).

As the Tu-154 neared Smolensk, the aerodrome controller told the crew that the airport had “unsuitable landing conditions.” The commander replied, “If possible, we shall attempt approach, and if the weather is too bad, we will go around.”

The commander told an aide to Polish President Lech Kaczynsky, who was among the passengers, that they would not be able to land and asked for a “decision as to what we are going to do.” The aide later returned to the flight deck and said that a decision had not been made.

The only instrument approach available was based on two nondirectional beacons supplemented with radiolocators used by a landing zone controller to inform pilots about their position relative to the threshold of Runway 26, the 2.7-degree glide path and the extended runway centerline. The published minimum descent altitude was 100 m (328 ft).

The air force CIC came to the flight deck as the crew was being vectored to the final approach course. Although he did not don a headset and spoke only twice, making an altitude callout at 100 m and a comment about “nil visibility” later in the approach, the report said that his (and the aide’s) presence on the flight deck was “unacceptable” and “could have distracted the crew and drawn their attention away from core duties.”

The landing zone controller advised the crew several times of their distance from the runway threshold, saying each time that they were “on track and path” although the aircraft was above the acceptable glide path deviation limit and left of the extended centerline limit. The controller made the same callout when the Tu-154 later descended 20 m (66 ft) below the glide path and was 80 m (262 ft) left of the extended centerline.

The report concluded that the “absence of reaction” by ATC to the Tu-154’s flight path deviations was the consequence of a malfunction of the radar system’s gain adjustment,

interference with the radar signals by trees that had grown beyond the permissible height along the final approach path or errors in the manual tuning of the system.

Early in the approach, the copilot reacted to a terrain awareness and warning system (TAWS) “TERRAIN AHEAD” warning by adjusting the altimeter setting to increase the indicated altitude and “fool the TAWS,” the report said. The crew did not respond to “PULL UP” warnings generated later in the approach.

The Tu-154 was at a radar altitude of 91 m (299 ft) and 698 m (2,290 ft) from the runway threshold when the commander announced that he was initiating a go-around. He pulled the control column back and increased thrust, but the aircraft continued losing height due to inertia. A section of the left wing struck a tree and separated. The aircraft rolled inverted and struck rising terrain.

Among the “contributing circumstances” cited by the report were the crew’s failure to monitor altitude and respond to the TAWS “PULL UP” warnings, and the controller’s on-track, on-path callouts, “which might have affirmed the crew’s belief that the approach was proceeding correctly.”

The report also is highly critical of the 36th Special Airlift Regiment, describing the flight crew’s training and preparation for the flight as “hasty [and] haphazard.” According to media reports, the regiment was disbanded in August, and government flights were reassigned to Poland’s commercial carrier, LOT Airlines. ➔

This article is based on the English translation of the Polish committee’s final report, 192/2010/11, available from the Polish Ministry of Internal Affairs and Administration at <mswia.datacenter-poland.pl/FinalReportTu-154M.pdf>.