

# Volna Failure Review Board Reports On Loss Of Cosmos 1

July 22 2005

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The Volna Failure Review Board convened by the Makeev Rocket Design Bureau, manufacturers of the Volna launch vehicle, has made its final report to the Russian space agency, Roskosmos, concerning the attempted June 21 launch of our Cosmos 1 spacecraft.

They concluded that the telemetry data from the launch vehicle was sufficient to determine that the launch failed due to an premature shut-down of the first-stage engine caused by a "critical degradation in operational capability of the engine turbo-pump."

The engine shut down after firing for 82.86 seconds, instead of the expected burn of approximately 100 seconds. The Failure Review Board concluded also that the first and second stages never separated and, as a result, the spacecraft propulsion system did not fire, and the spacecraft did not separate from the third stage.

They stated that the launch vehicle's on-board control system automatically aborted the mission 160 seconds into the flight. They did not describe any telemetry data to support the conclusion that the rocket's stages never separated.

The review board included members from Makeev, the Lavochkin Association (which built Cosmos 1) and Tsniimash, a lead engineering center of the Russian space agency.

No one involved with spacecraft tracking or on-board electronics

participated in the analysis, and the board did not review or consider the data received at the Kamchatka portable tracking station that some of the team think might have come from the spacecraft. That would only have been possible if the spacecraft had separated from the rocket and its orbit insertion motor had fired.

The team from the Space Research Institute and The Planetary Society analyzing the tracking data has now ruled out the possibility that any signals received at the Panska Ves station in the Czech Republic came from the spacecraft.

The signal received at the Majuro portable station in the Marshall Islands is also unlikely to have come from the spacecraft. But the Kamchatka data looks very much consistent with having come from Cosmos 1.

The Planetary Society was not invited to be part of the failure review. We did receive a warning from the U.S. State Department reminding us that, under International Arms Traffic Regulations (ITAR), we are not allowed to participate in a launch failure review without their approval. . But even before the failure review, there was a serious lack of communication and coordination with the project and launch vehicle teams.

The Society is considering its next steps in planning how we will try again. We need additional data before we can reach an independent conclusion about whether or not the Volna's stages separated and the spacecraft's orbit insertion motor fired. With that information, we will be better able to chart our course for the next flight of a solar sail.

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