Sea Launch - Summary of Investigation and Return-to-Flight Preparations - July 2000

Sea Launch began its third mission on March 12, 2000, at 6:49 am PST, with the launch of its Zenit-3SL rocket that was to place the ICO F-1 communications satellite into orbit. As a result of an anomaly in the operations of the second stage of the 3-stage vehicle, the spacecraft failed to reach orbit.

Immediately following this failure, the partners of the international launch services company began independent investigations. A Failure Review Oversight Board reviewed all relevant investigation material in May, concluding that the single credible root cause for the failure was the absence of a ground software command to close a pneumatic system valve on the second stage of the vehicle prior to liftoff.

As a result of launching with this valve in the incorrect position, a sequence of events followed, involving excessive loss of helium. Ultimately, the rocket did not reach orbital velocity, leading to a premature shutdown of second-stage engine and termination of the flight.

As reported by the CIS Joint Commission, the failure to issue the command to close the valve was a result of a software logic error. Reviews and test processes failed to identify the error prior to launch. The investigations found no evidence of any other credible contributors to the failure. All other systems, not affected by the lack of the valve closure, performed nominally. Upon reaching consensus, members of the Failure Review Oversight Board issued a signed report to Will Trafton, president of Sea Launch, on May 22.

The Sea Launch team proceeded with the development of a plan for corrective action, which included a number of tasks, related to both the correction of the ground software error by the CIS partners and enhancement of their general software change/implementation process of the ground support systems.

In early June, the Sea Launch partners met to conduct a Return-to-Flight /System Readiness Review. These meetings were required to achieve closure of the Sea Launch Failure Review Oversight Board investigation and determine that Sea Launch is ready to fly for its next mission. All participants signed a certificate of agreement indicating all corrective actions were being implemented satisfactorily. The Board concurred that these measures will provide adequate verification of the ground system software, as well as the pre-launch sequencing, to ensure a similar failure will not occur in the future. Following briefings with the Sea Launch customer and insurance communities, the Sea Launch team initiated preparations for the launch of the PAS-9 communications satellite, planned in late July.

Sea Launch, based in Long Beach, Calif., launches commercial communications satellites into orbit from a floating platform positioned on the equator at 154 degrees West Longitude. The Sea Launch partners include Boeing, RSC Energia, SDO Yuzhnoye/PO Yuzhmash and the Anglo-Norwegian Kvaerner Group.

For information and updates on the forthcoming mission, visit the Sea Launch page at http://www.sea-launch.com

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