Boeing Releases Results of Independent Mission Assurance Review

The Boeing Company [NYSE: BA] has received the results of an Independent Mission Assurance Review Committee and is in the process of implementing the review committee's recommendations. Dr. Sheila Widnall, former Secretary of the Air Force and Massachusetts Institute of Technology professor, chaired the independent committee. It was chartered by Boeing to review the company's expendable launch vehicle programs and make recommendations to improve mission success.

The committee reviewed the Delta II, Delta III, Delta IV and Inertial Upper Stage programs, as well as the company's role as a subcontractor building Titan IV fairings and Sea Launch payload accommodations.

"It was evident during our review that Boeing has a culture that promotes quality engineering and production along with continuous improvements," said Dr. Widnall. "However, we felt Boeing underestimated the design challenge of developing the new Delta III from the mature Delta II." The first Delta III failure was due to improper analytic assumptions in the dynamic models and poor communication between two design engineering groups.

"The second Delta III failure and the IUS failure were due to a lack of communication and understanding between design engineering and manufacturing about the engineering intent for the operation of the hardware," said Widnall.

Design engineering processes were cited as the root cause of the majority of the failures reviewed. The committee concluded cost and schedule pressures were not factors in the recent Boeing launch failures.

It was concluded that Delta II is a mature program with an excellent reliability record and provides a sound basis for Boeing to proceed in developing new launch systems to compete in the global market. However, the mission assurance process appropriate to the success of the mature Delta II program is not adequate for the new Delta III and Delta IV programs. The committee also noted that Delta IV is designed to be more reliable and more cost effective than Delta II and Delta III but is a complex development program. The committee said that Boeing is evolving from a single product line to a multiple product line, and that this will require an increasing emphasis on design engineering oversight, testing, supplier quality, and enhanced independent mission assurance activities.

The IUS program and the Titan Fairings program were noted to be programs that are coming to an end, but both have critical payloads left to support. As such, the committee recommended that Boeing pay particular attention to skills retention and employee morale to maintain system reliability through their last flights.

The committee also recommended that Boeing increase its focus on quality in every phase, from design through manufacturing to operations, in the belief that a strong quality-first focus will lead to increased reliability at reduced cost. Other recommendations were made in areas such as systems engineering, engineering accountability, supplier management, flight instrumentation and post-flight analysis.

"We believe that the committee's review was comprehensive and the recommendations are constructive," said Jim Albaugh, Boeing Space and Communications Group president. "We take their findings very seriously and are initiating steps to implement the committee's recommendations immediately with respect to our launch programs."

These steps include strengthening systems engineering with special emphasis on horizontal integration and reestablishing the responsibility of the design engineers. A new position, "Responsible Engineer," will be created. Responsible Engineers will have the mandate to follow subsystems and components from initial design through post-flight analysis. These engineers also will have the responsibility for ensuring that adequate communications exist between design engineering and manufacturing.

An increased emphasis will also be placed on managing the risk of failure when considering and implementing changes or upgrades to existing hardware. Boeing will strengthen its supplier management and supplier quality, and increase its use of independent reviews during all levels throughout the life of the program. "By reinforcing quality and reliability as a company priority we will be able to provide our customers better value," said Albaugh. "The natural upside to producing quality products is that we will achieve improved on-time delivery, lower cost and increased customer satisfaction."

The Boeing Mission Assurance Review Committee included senior aerospace professionals with commercial, NASA, U.S. Air Force and industry experience. The members were:

- Dr. Sheila E. Widnall

  Professor, MIT, and former Secretary of the Air Force

- Mr. Steven D. Dorfman

  Recently retired Vice Chairman, Hughes Electronics Corp.

- Mr. Frederick (Rick) H. Hauck

President and CEO of AXA Space, and former Navy test pilot and Space Shuttle Commander

- Mr. George W. Jeffs

  Retired President, North American Space Operations,

Rockwell International

- Gen. Donald J. Kutyna (USAF Retired)

  Vice President, Loral Space and Communications, and former Commander, US Space Command

- Dr. Eberhardt Rechtin

  Retired Professor, University of Southern California, and former President of Aerospace Corporation

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