



United States  
General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-254122

July 29, 1993

Daniel S. Goldin  
Administrator, National Aeronautics  
and Space Administration

Dear Mr. Goldin:

We have completed our survey of the National Aeronautics and Space Administration's (NASA) preparations for its initial Hubble Space Telescope (HST) servicing and repair mission. Based on NASA's recent and planned actions, we plan no further work on the HST mission at this time. During our survey we held extensive interviews with HST program management officials at all levels. We met with and observed astronauts in training, held discussions with members of independent review teams created by NASA, and reviewed reports presented by these teams. We also attended project director meetings and program status briefings, and participated in briefings of the independent review teams.

This open and cooperative process enabled us to participate in discussions of issues as they were being identified and developed. All of the issues we raised have been addressed by the independent review teams and have been acted on by program management, or are currently receiving consideration by top management.

We believe NASA's use of independent review teams and input from individual experts has increased the probability for the success of this mission. Of particular significance was the establishment of the Task Force on HST Servicing Mission, headed by Dr. Joseph F. Shea, and the establishment of the Office of the Mission Director. In our opinion, these two focal points were effective mechanisms for consolidating issues raised NASA-wide, identifying potential problems, and ensuring implementation of solutions.

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Although HST was designed to be serviced on-orbit, this first mission presents a difficult challenge for NASA to demonstrate that extensive on-orbit maintenance is practical and cost-effective. Notwithstanding the depth and breadth of mission preparations, some existing limitations may affect the planning and implementation of the mission.

Specifically,

- while some improvements are being made in the training simulators for this mission, NASA is limited in its ability to provide a fully integrated mission simulation linking the shuttle simulator, mission control, and the neutral buoyancy activity;
- the mission will, as with prior missions, be vulnerable to potential shuttle reliability problems;
- NASA's experience in conducting a series of consecutive, long duration, extra-vehicular activities is still relatively limited; and
- the Hubble is a relatively old spacecraft, due to its long development period (beginning in 1977), and its overall durability and reliability is still uncertain.

The HST mission, as a pioneering effort, is planned to exceed the complexity and duration of extra-vehicular activity performed on any prior shuttle mission. It would, therefore, not be unusual for unanticipated problems to arise that may prevent the completion of all planned tasks. Also, there is the potential for additional component failures aboard HST prior to launch. NASA should adequately communicate these factors to Congress and others and emphasize that an additional, near-term, servicing mission may be required to eliminate the total backlog of desired maintenance. In this event, and as recommended by the HST Task Force, NASA is prepared to conduct a follow-on servicing mission to be launched no later than 6 to 12 months after the first mission.

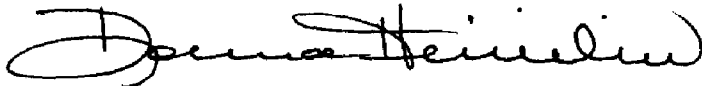
We recognize the dedicated and comprehensive efforts of the NASA employees and contractors working to make the first HST servicing and repair mission a success. We would also like to acknowledge the high level of cooperation and assistance provided to us by the Observatories Development Branch; the Office of the Associate Director of Flight Projects for HST; and the Office of the HST Mission Director.

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We are sending copies of this letter to appropriate congressional committees and to the Director, Office of Management and Budget. We will also make copies available to others upon request.

Please contact me on (202) 512-8412 if you or your staff have any questions concerning this report. Other major contributors to this report were Frank Degnan, Assistant Director; William W. Crocker, Evaluator-in-Charge; Mona M. Zadjura, Evaluator; Vijay J. Barnabas, Evaluator; and Marguerite P. Mulhall, Evaluator.

Sincerely yours,



Donna M. Heivilin, Director  
Defense Management and NASA Issues

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