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Washington, DC 20546

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March 23, 1999

Mr. Daniel S. Goldin
Administrator
National Aeronautics and
Space Administration
Washington, DC 20546

Dear Mr. Goldin:

We had a very substantive meeting at Headquarters on February 24 and 25, 1999. The Council was pleased to hear from the five Space Transportation Architecture Studies (STAS) contractors and from the NASA In-house team. Every presenter provided the Council with good detail and all were willing to answer our questions. On behalf of the Council, I would like to offer thanks to Dan Mulville, Del Freeman, Lori Garver, and Mike Green, for their efforts in pulling together these important presentations. Additionally, the Council sincerely appreciates the time you spent with us and your insights at the meeting.

The Council has several generic thoughts on the presentations by the contractors. First, several presentations were highly biased and very different in content, style, and results. Second, the case for the replacement of the Shuttle is not yet made strongly enough or with credibility. Additionally, with the exception of one presentation, safety was clearly not adequately emphasized by the contractors. Also, the cost estimates need to include error margins and a clearer selection criteria/weighting should be considered. For your information, the Council found the NASA In-House effort to be excellent. Finally, if the decision (selecting a new launch system) is based exclusively on "business" it will be business as usual...the national requirement must rise to the forefront.

We also identified technology areas that need further attention. Many of the architectures relied on highly reliable (.99xx) and reusable (>50), 300 - 400K pound thrust engines. The Council believes much more research needs to be directed into this type of rocket engine. Also, there is a clear need for additional work in improving our knowledge of capabilities and techniques for advanced composites, such as for fuel tanks.

During our afternoon session on the February 25th, we outlined a list of central issues concerning future space transportation. The interaction with you on these thoughts was encouraging to everyone. I have decided to list these issues and thoughts in this letter for your further consideration.

- Phase III of the STAS and consolidation “plan” needs to lay out a replacement decision for Shuttle.
- Requirements are not adequately scrubbed, there has been little engineering behind the pretty pictures in most of the STAS presentations.
- There is an urgent requirement for a Crew Return Vehicle (CRV), it should be later tied to a Crew Transport Vehicle (CTV), but not delayed.
- Upgrades to the Shuttle are still not justified in an adequate way in terms of safety and near-term cost reductions.
- What milestones are needed to be demonstrated prior to prudently proceeding with a SSTO?
- Lower-tech, reusable TSTO (Two Stage to Orbit) has not been adequately examined.
- The reliability and safety of an ELV should be further examined.
- Human missions and cargo should be separate requirements.
- The Liquid Flyback booster is not adequately justified and is a deterrent to commercial development.

As a result of our discussions, the Council drafted three formal recommendations for the agency. These have been forwarded to Dr. Mulville for comments by his team as they moved toward Phase III of the STAS.

Draft Recommendation One:

NASA should plan and lead the transition to low-cost, reliable human access-to-space by taking three actions:

- (a) ceasing any expenditure on major performance upgrades for the Shuttle, such as liquid flyback boosters (LFBB), reusable first stages (RFS), or five segment reusable solid rocket boosters;
- (b) limiting future Shuttle upgrades solely to those necessary for safety and for any significant near-term cost reductions, and
- (c) utilizing the Independent Assessment of the STAS as a basis, committing now to near-term establishment of an approximate terminal date for Shuttle operations, and planning for an orderly phase-down of Shuttle infrastructure.

Draft Recommendation Two:

To provide the nation with possible alternatives to Venture Star, NASA should actively reshape the billion-dollar funding wedge in FY00-04 into creative government-industry programs. Most essential is a vehicle which employs robust two-stage-to-orbit (TSTO) technology in event SSTO is not viable in the near-term. In every case the operational capability date of the human access-to-space replacement should be as early as possible in the next decade.

Draft Recommendation Three:

The long-term requirements for the cargo delivery to space be fulfilled by a viable commercial launch vehicle program with the retirement of the Shuttle.

We will further consider these recommendations after receiving comments from Dr. Mulville at the next NAC meeting.

We have decided that our May meeting will deal primarily with the space station program. The Council eagerly awaits a briefing on NASA's revised ISS Probability Risk Assessment. The exact date of the May meeting is in flux as we try to coordinate our meeting with the launch of STS-96. Once again, thanks for your time and input at our last meeting.

Sincerely,



Bradford W. Parkinson
Chair