

THOMAS P. STAFFORD
1006 Cameron Street
Alexandria, VA 22314

June 6, 1994

Dr. Bradford Parkinson
Chairman, National Aeronautics and
Space Administration Advisory Council
National Aeronautics and Space Administration
Washington, DC 20546-0001

Dear Dr. Parkinson:

On May 24 and 25, I convened the first meeting of the NASA Advisory Council Task Force on the Shuttle-Mir Rendezvous and Docking Missions at the Johnson Space Center (JSC). The minutes for this meeting and the names of those Task Force members who participated are enclosed.

It is the Task Force's conclusion that a great deal of work has gone into the preparations for the first two missions, STS-71 and STS-74. It was quite evident that planning for these Shuttle-Mir missions has been extensive and that a high level of dedication and commitment to this effort exists throughout the organizations involved. Also clear was the critical role that Phase 1 will play in preparing for the development, construction, operation, and utilization of the International Space Station Alpha.

Based on these initial briefings and Task Force discussions, we would like to make the following immediate recommendations:

- At a minimum, the mission commander and payload commander for all subsequent Shuttle-Mir missions should be named at least 18 months in advance of the scheduled launch date.
- In order to derive early operational experience in advance of the first Mir docking mission, the primary objective of STS-63 should be Mir rendezvous and proximity operations.
- If at all possible, the launch date for STS-63 should be moved forward.

During the course of the initial briefings a number of additional issues and questions were raised which the Task Force intends to explore further. Towards that end, I have established four working groups composed of Task Force members and technical advisors. Each working group will collect additional information regarding the issues in its particular area, review that information, and report its initial findings and recommendations at our next meeting, tentatively scheduled for 12 and 13 July. Following that meeting, I will provide you with a detailed report and additional recommendations.

Given the dedication of the Task Force members and technical advisors as well as the wealth of knowledge and experience they represent, I feel confident that the working groups will provide a wide range of valuable insights at the July meeting of the Task Force. As mentioned above, the information provided by the working groups will be incorporated into a detailed report to be provided to you shortly following the meeting.

In conclusion, I would like to call to your attention the outstanding support the Task Force has received from the Johnson Space Center, the International Space Station Alpha Program, and the Space Shuttle Program. This is particularly appreciated given the busy schedules of the many individuals who contributed to the meetings.

Sincerely,

A handwritten signature in cursive script that reads "Thomas P. Stafford". The signature is written in black ink and is positioned above the typed name.

Thomas P. Stafford
Lt. General, USAF(Ret.)

cc:

NASA/Code A/Mr. Goldin
NASA/Code M/Gen. Pearson
NASA/Code I/Ms. A. Accola

NASA ADVISORY COUNCIL
TASK FORCE ON THE SHUTTLE-MIR
RENDEZVOUS AND DOCKING MISSIONS
 Initial Briefing
 Lyndon B. Johnson Space Center
 Building 1, Room 966
 24 - 25 May 1994
 Meeting Minutes

Tuesday, 24 May 1994		
9:05 - 9:10	Welcoming Remarks	Dr. Carolyn Huntoon JSC Center Director
9:10 - 10:20	Phase 1 Overview <ul style="list-style-type: none"> • Background (International Agreements) • Phase 1 Scope • Goals of Phase 1 • Joint Working Group Structure • Cooperative and Contractual Arrangements • Program Schedule 	Mr. James Nise International Space Station Alpha (ISSA) Program Office
10:30 - 11:25	Mission Overviews (STS-63, STS-71, and STS-74) <ul style="list-style-type: none"> • Mission Objectives • Mission Summary • Flight Summary 	Mr. David S. Grissom Space Shuttle Program Office
11:25 - 12:00	STS-71 Science Overview <ul style="list-style-type: none"> • Joint Science Working Group • Priorities • Investigations • Disciplines • Hardware • End of Mission Countermeasures • Training • Timeline • Post-Flight Activity Planning 	Dr. Peggy Whitson JSC Space and Life Sciences Directorate
12:15 - 3:10	Orbiter Docking System <ul style="list-style-type: none"> • Requirements Highlights • Hardware Overview • STS-71 Program Status • STS-74 Program Status • Androgynous Peripheral Assembly System (APAS) Docking Mechanism Overview 	Mr. Stuart McClung JSC Orbiter and GFE Projects Office Mr. John McManamen JSC Engineering Directorate

Wednesday, 25 May 1994

8:10 - 10:00	<p>Systems Integration</p> <ul style="list-style-type: none">• Roles and Responsibilities• STS-63 and STS-71 Overview and Status• Joint Engineering Analysis Approach• On-Orbit Engineering Areas<ul style="list-style-type: none">- Mated Flight Control- Loads and Dynamics- Thermal Control- Life Support Systems- Avionics- Rendezvous and Docking Aids• STS-74 Overview and Status	<p>Mr. Gregory Lange Space Shuttle Integration and Operations Office</p> <p>Mr. Donald Noah Space Shuttle Integration and Operations Office</p>
10:00 - 11:10	<p>Operations</p> <ul style="list-style-type: none">• Flight Design Overview• Mir Approach Demonstration DTO• +Rbar Approach• New Tools for Rendezvous and Docking• Proximity Operations• Organization• Flight Operations• Flight Rules• Attitude Planning• Communication and Interaction Between Mission Control Centers• Schedules	<p>Mr. Gary Coen JSC Mission Operations Directorate</p>
11:30 - 12:15	<p>Crew Exchange and Training</p> <ul style="list-style-type: none">• Crew Exchange and Training Working Group<ul style="list-style-type: none">- Functions- Members- Interfaces• Documentation• Status• Training Challenges• Training Strategy• Cosmonaut Training Plan• Comparison of U.S. and Russian Training• Bailout/Egress• Docking Mission Training• Crew Tasks During Prox Ops/Docking	<p>Mr. Steven Nagel JSC Flight Crew Operations Directorate</p> <p>Mr. Tommy Capps JSC Mission Operations Directorate</p> <p>Mr. Steven Nagel JSC Flight Crew Operations Directorate</p>
12:30 - 1:00	<p>Safety</p> <ul style="list-style-type: none">• Safety Assurance Working Group• Safety Assurance Policy and Guidelines• Shuttle/Mir Program Safety Documentation Development• Safety Requirements• Analysis of Off-Nominal Situations and Hazardous Conditions• Readiness to Support the Mission• Schedule	<p>Ms. Charlene Sarver JSC Mission Operations Directorate</p>

TASK FORCE MEMBERS AND TECHNICAL ADVISORS
ATTENDING THE 24 - 25 MAY MEETING

Team Members

Lt. Gen. Thomas P. Stafford, USAF (Ret.), Chairman
Stafford, Burke and Hecker, Inc.

Col. James C. Adamson, USA (Ret.)
President, Monarch Precision

Dr. Michael A. Greenfield
Deputy Associate Administrator, NASA Office of Safety and Mission Assurance

Maj. Gen. Ralph Jacobson, USAF (Ret.)
President and CEO, The Charles Stark Draper Laboratories

Mr. James M. Heflin, Jr.
Flight Director Office, NASA Lyndon B. Johnson Space Center

Dr. Arnauld Nicogossian
Deputy Associate Administrator, NASA Office of Life and Microgravity Sciences and Applications

Mr. Chester A. Vaughan
Chief, Propulsion and Power Division, NASA Lyndon B. Johnson Space Center

Capt. John Young, USN (Ret.)
Special Assistant for Engineering, Operations, and Safety, Office of the Director,
NASA Lyndon B. Johnson Space Center

Executive Secretary

Mr. William L. Vantine

Technical Advisors

Maj. Gen. Joe H. Engle, USAF (Ret.)
President, Engle Technologies, Inc.

Mr. Glynn Lunney
President, Rockwell Space Operations Company

NASA Advisory Council
National Aeronautics and Space Administration
Washington, DC 20546

August 25, 1994

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

Dear Dan:

Gen. Stafford has provided the NASA Advisory Council with the first formal report of the Task Force on the Shuttle-Mir Rendezvous and Docking Missions. It covers the issues addressed by its working groups and at its last meeting. Recommendations for management and mission success are included.

The Council has not reviewed this report. We are forwarding it to you for your consideration, neither giving nor withholding its endorsement by the Council.

The Task Force is clearly conducting a very thorough review of the Shuttle-Mir rendezvous and docking missions. As they continue their work, we will keep you apprised of their results and recommendations. I would be happy to pass on any comments or reaction to this report to Gen. Stafford.

Sincerely,

Bradford W. Parkinson
Chair

Enclosure

cc:
Gen. Stafford (w/out enclosure)

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National Aeronautics and
Space Administration

Headquarters
Washington, D. C. 20546-0001

PRIORITY
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Reply to Attn of:

JSC, TL-94-018

JUL 22 1994

To: M/Executive Secretary, Stafford Committee
From: GA/Deputy Manager for Program Integration
Subject: STS-63 Launch Date Acceleration

We have recently completed a study relative to the Stafford Committee recommendation to accelerate the February 2, 1995, launch date of STS-63 (Mir Rendezvous/Flyby). The two fundamental ways to accomplish this objective and the resulting impacts to Shuttle launch schedules are discussed below.

There are not any flights in the manifest in calendar year 1994 that could accomplish Mir Rendezvous/Flyby without offloading primary payloads. When STS-63 slipped to February 1995, we examined other options to fly Mir Flyby in 1994 and did not consider any options viable considering the relative priorities of the payloads and Mir Rendezvous/Flyby.

Although I agree it is desirable to have more time between Mir Flyby and STS-71, I believe that we do have adequate time between STS-63 and STS-71 to implement the STS-63 lessons learned on STS-71.

The first option considered switching the launch order and dates for STS-67 and STS-63 to provide a 3-week acceleration for STS-63. This acceleration requires the processing time for STS-63 to be reduced to a very optimistic schedule (a 3-week reduction). More importantly, the OV-105 launch of STS-67 would slip the same 3 weeks to accommodate the STS-63 acceleration. The 1995 OV-105 processing schedule is such that OV-105 flights subsequent to STS-67 would slip day for day with STS-67. Resolving the spacing of these new OV-105 launch dates with scheduled launches on other orbiters would result in the loss of a currently manifested flight in FY95.

The second option considered accelerating STS-63 by 1 week while maintaining the launch sequence of STS-63 and the flight prior to it (STS-67, Astronomy Payload-02 (Astro-02), January 12, 1995). This option is not practical due to the spacing between these two flights and the limited time available to process STS-67. The launch-to-launch spacing for the two flights is 21 days. A 1-week acceleration of STS-63 could be accomplished in itself, but this would require STS-63 to launch prior to the landing of the 16-day STS-67 mission. However, the capability to support two flights simultaneously does not exist. Any acceleration of STS-67 to alleviate the spacing problem further tightens what is already an

extremely tight processing flow for this mission while providing only a minimal gain for STS-63.

In summary, our study finds the results of even a modest acceleration of STS-63 to be too costly in terms of either the STS-67 processing time, or alternatively, the OV-105 launch schedule and flight rate for FY95.

I hope this explanation has satisfied the committee's inquiry, and should you have any further questions concerning this matter, please give me a call.



Tommy W. Holloway

cc:

HQ/M-7/B. D. O'Connor
HQ/M-4/W. C. Trafton
HQ/ME/N. B. Starkey
HQ/MZ/E. K. Huckins
JSC/AC/S. H. Garman
JSC/CA/D. C. Leestma
JSC/CB/R. L. Gibson
JSC/DA/J. W. O'Neill
JSC/DA2/B. R. Stone
JSC/EA/L. S. Nicholson
JSC/GA/J. L. Smothermon
JSC/GA/D. S. Grissom
JSC/GA2/C. E. McCullough
JSC/GF/T. R. Loe
JSC/GM/D. C. Schultz
JSC/GR/T. W. Logan
JSC/MA/B. H. Shaw, Jr.
JSC/MA2/J. B. Costello
JSC/MA3/M. D. Erminger
JSC/OA/R. H. Brinkley
JSC/OA/J. R. Nise

JSC/TA/R. D. Dittmore
JSC/TL/R. E. Matthews
JSC/TL/S. P. Hutchins
JSC/VA/D. M. Germany
JSC/WA/L. G. Williams
KSC/CM/J. T. Conway
KSC/MK/L. J. Shriver
KSC/TM/J. F. Honeycutt
KSC/TM/R. B. Sieck
KSC/TP/J. F. Harrington III
KSC/TV/J. R. Lang
MSFC/EA01/R. J. Schwinghamer
MSFC/SA01/A. A. McCool
MSFC/SA21/G. C. Ladner
MSFC/SA21/O. K. Goetz
MSFC/SA31/P. V. Counts
MSFC/SA41/C. H. Rutland
MSFC/SA51/V. K. Henson
MSFC/SA61/J. S. Chapman
MSFC/SA71/J. M. Ellis