

National Aeronautics and Space Administration

**NASA Advisory Council Task Force
on
International Space Station Operational Readiness**

**June 7, 2000
NASA Headquarters
Washington, DC**

MEETING REPORT



Original signed by

Philip J. Cleary
Executive Secretary

Original signed by

Thomas P. Stafford
Chairman

**NASA ADVISORY COUNCIL TASK FORCE ON INTERNATIONAL SPACE
STATION OPERATIONAL READINESS**

June 7, 2000
NASA Headquarters
Washington, DC

MEETING REPORT
TABLE OF CONTENTS

Attachment A	Task Force Membership
Attachment B	Meeting Attendees

NASA ADVISORY COUNCIL TASK FORCE ON INTERNATIONAL SPACE STATION OPERATIONAL READINESS

June 7, 2000
NASA Headquarters
Washington, DC

MEETING REPORT

Mr. Philip Cleary, Task Force Executive Secretary, welcomed the participants to the Open Meeting that was held to review the results of the fact-finding sessions conducted by the NASA Advisory Council's Task Force on International Space Station (ISS) Operational Readiness and the Rosaviakosmos Advisory Expert Council (TF-AEC). These meetings were conducted at the request of NASA Administrator Dan Goldin and Rosaviakosmos General Director Yuri Koptev who tasked the TF-AEC Joint Commission to review: the completed Russian investigation on the cause of the Proton Launch failures in 1999; the corrective actions taken; and the safety, reliability and quality assurance processes implemented for the Service Module launch vehicle.

Major General Ralph H. Jacobson, Co-Chairman of the TF Proton Working Group, gave a brief overview of the measures and design modifications (known as Phase 2) that the Proton engine manufactures at the Voronezh Mechanical Plant have implemented to reduce contamination in the engines and increase quality assurance:

Phase 2 Modifications

- Redesign of the turbine housing. This is now an integrated/welded component made from 55% Nickel alloy.
- Addition of 300 micron filters in the oxidizer lines of the gas generator.
- Improved design of the filter in the ground servicing lines and installation of filters in the launch vehicle on-board filling lines.

These modifications have been tested on the ground and on June 6, 2000, there was a successful launch of a Proton with the Phase 2 engines (the same engine design that will be used to carry the Service Module into orbit). Another Proton launch, also using the Phase 2 redesigned engines, is planned prior to the launch of the Service Module. General Jacobson pointed out that if the next scheduled launch takes place, there will have been 32 successful firings of the modified engine before Service Module launch, which he believes constitutes a robust test program.

General Jacobson stated that the TF-AEC has some concern that the Russians have been unable to reproduce the engine fire by injecting foreign material into the gas generator. During ground tests, twenty grams of contamination were introduced in a ground test engine firing, in which erosion on the turbopump nozzle was confirmed, however, a fire did not start. The TF-AEC Joint Commission notes that experience and testing has demonstrated the difficulty of consistently reproducing a metal fire in an oxygen rich environment even when the failure conditions are known and repeatedly tested. Therefore, the fact that a fire did not start in the ground test engine does not invalidate the proposed cause.

Additional testing is being done to reproduce the fire, but the Joint Commission does not believe that testing will be completed prior to the Service Module launch. The TF-AEC Joint Commission is interested in seeing this data as it becomes available, but concurs with the Russian assessment that the most probable cause of the failures was engine contamination.

Lt. General Thomas Stafford, USAF (Ret.), Chairman of the ISS IOR Task Force, concurred with Gen. Jacobson's opinion that the Russians have an impressive testing procedure in place. He added his personal appreciation for the efforts of the Working Group to complete this comprehensive failure investigation assessment.

General Jacobson concluded the meeting at 12:20pm Eastern Daylight Time.

**NASA Advisory Council
Task Force on International Space Station Operational Readiness**

June 7, 2000
NASA Headquarters
Washington, DC

Task Force Membership

Chairman

Lt. Gen. Thomas Stafford, USAF (Ret.)

Members

Col. James Adamson, U.S. Army (Ret.)
Mr. Percy Baynes
Mr. Benjamin Cosgrove
Mr. Joseph Cuzzupoli
Dr. Charles Daniel
Dr. John Fabian
Dr. Craig Fischer
Dr. Michael Greenfield
Mr. J. Milt Heflin
Dr. Daniel Heimerdinger
Maj. Gen. Ralph Jacobson, USAF (Ret.)
Dr. Ronald Merrell
Mr. David Mobley
Dr. Shawn Rahmani
Dr. Andrew Thomas
Captain John Young, USN (Ret.)

Technical Advisors

Maj. Gen. Joe Engle, USAF (Ret.)
Mr. Mark Thiessen

Executive Secretary

Mr. Philip Cleary

Asst. Executive Secretary

Ms. Holly Stevens

NASA ADVISORY COUNCIL TASK FORCE ON INTERNATIONAL SPACE STATION
OPERATIONAL READINESS

June 7, 2000
NASA Headquarters
Washington, DC

Meeting Attendees

Stafford Task Force Representatives

Lt. Gen. Thomas Stafford, USAF (Ret.), Chairman – via teleconference
Mr. Percy Baynes – via teleconference
Mr. Joseph Cuzzupoli – via teleconference
Dr. Chuck Daniel – via teleconference
Dr. John Fabian – via teleconference
Dr. Craig Fischer – via teleconference
Dr. Michael Greenfield – via teleconference
Dr. Daniel Heimerdinger – via teleconference
Maj. Gen. Ralph Jacobson – via teleconference
Mr. David Mobley – via teleconference
Dr. Shawn Rahmani – via teleconference
Dr. Andy Thomas – via teleconference

Stafford Task Force Technical Advisors

Maj. Gen. Joe Engle, USAF (Ret.) – via teleconference
Mr. Mark Thiessen – via teleconference

Task Force Executive Secretary

Mr. Philip Cleary – via teleconference

Task Force Asst. Executive Secretary

Ms. Holly Stevens – via teleconference

Others

Jennifer McCarter, NASA Headquarters
Russian Embassy Representative
Space News Representative
Robert Schindler, Technical Advisor