

SUBJECT: Soyuz-27, Expedition 28 / Increment 28 MORR Minutes

DATE: April 5, 2011

PLACE: Goddard Space Flight Center, B12/Rm E200A

TIME CONVENED: 1300

TIME ADJOURNED: 1400

ATTENDANCE

<i>Last Name</i>	<i>First Name</i>	<i>Organization</i>	<i>E-mail Address</i>	<i>Telephone #</i>
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<i>Via Teleconference</i>				
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INTRODUCTION

Mr. Jim Bangerter convened the Soyuz-27, Expedition 28 / Increment 28 Mission Operations Readiness Review (MORR) to review Integrated Network (IN) element mission operations readiness (refer to the presentation, *Soyuz-27, Expedition 28 Increment 28 Mission Operations Readiness Review [MORR]*). This MORR covers changes and updates to the network since the Soyuz-26 MORR.

MEETING ITEMS

A. Welcome/Introduction

1. Mr. Bangerter reviewed the agenda for the MORR.
2. Mr. Bangerter reviewed the MORR board membership.
 - Mr. Kenneth E. Lehtonen, Chairperson, GSFC/Code 301, Systems Review Office.
 - Mr. John J. Hudiburg, GSFC/Code 599, 450 Senior Technical Authority (Mr. Robert Jones signed for).
 - Mr. Scott A. Greatorex, GSFC/Code 450.1, Chief, Networks Integration Management Office (NIMO).
 - Mr. Rivers C. Lamb, GSFC/Code 595, Navigation and Mission Design Branch.
 - Mr. Bradford Butts, GSFC/Code 761, Systems Management Branch.
 - Mr. Joseph Aquino, JSC/DD13, Manager, Space Communications Integration Office (SCIO) (Ms. Jewel Hervey signed for).
 - Mr. Marco Midon, GSFC/Code 453, Ground Network Project.
 - Mr. Donald W. Shinnors, GSFC/Code 452, Space Network Project.
 - Mr. Mike Yettaw, DFRC, Range Technical Monitor, Western Aeronautical Test Range (WATR).
 - Mr. James A. Bangerter, GSFC/Code 450.1, Human Spaceflight Network Director.
3. Mr. Bangerter provided an overview of the review process (Goddard Space Flight Center [GSFC] MORR, Johnson Space Center [JSC] Mission Operations Directorate [MOD] Flight Readiness Review [FRR], and Stage Operations Readiness Review [SORR]). GSFC does not participate directly in the SORR, but is represented by the JSC Ground Controller's (GC) Office.

B. Mission Overview

1. Mr. Riley reviewed the Mission Profile. He stated that the launch is scheduled for May 30, 2011, but does not have a launch window at this time. Docking to the International Space Station (ISS) will be June 1, 2011. The Soyuz will remain docked for approximately 6 months at which time it becomes the Russian Crew Return Vehicle. The payload is crew, logistics, and supplies.
2. Mr. Riley reviewed ISS Supply Sequence. The supply sequence illustrates the activities during the different increments. We are currently in increment 27.

C. Integrated Network (IN) Overview

1. Mr. Riley reviewed the ISS/Soyuz IN Overview diagram. This is the basic network configuration in support of the ISS and Soyuz.
2. Mr. Riley reviewed the documentation. The table shows what documentation is or will be in place and when. All documentation is up to date. An Interim Support Instruction (ISI) has been added to document a change to the GSFC Flight Dynamics Facility (FDF) Soyuz satellite identification.

3. Mr. Riley stated that there have been no Program Requirement Document (PRD) changes.
4. Mr. Riley reviewed the Operational/Network Changes.
 - (a) The Wallops Ground Station (WGS) has implemented Very High Frequency (VHF)-1/2 transmit and receive recording via the Mission Operations Voice Enhancement (MOVE) system.
 - (b) The White Sands Complex (WSC) is re-evaluating the Engineering Change (EC)-TO015-4 VHF-1/2 to separate the transmit and receive capabilities. Originally, the tap point for the recording would have recorded the composite uplink and downlink. The re-evaluation is scheduled to be complete April 29, 2011. Mr. Bangerter stated that, after contract change, he would like an implementation completion date. Mr. Kevin Riley accepted an action item to provide a WSC transmit and receive recording capability implementation completion date (action item 0411-Soyuz MORR-01).
5. Mr. Riley provided a Network Verification Test summary.
 - (a) Monthly VHF-1 two-way voice checks were conducted with ISS and WGS on March 21, 2011; with the Dryden Flight Research Center (DFRC) on March 24, 2011; and with WSC on March 24, 2011.
 - (b) WSC support on February 4, 2011 was unacceptable due to excessive noise on the system 1 downlink. The suspected system 1 Power Amplifier (PA) was replaced on March 18, 2011.
 - (c) The WSC March 24, 2011 support was failed due to a pointing error. It was during this support that the new PA was to be formally evaluated. There has not been any significant change in noise levels with the new PA. All the cables and connectors will be checked. Mr. Bangerter stated that a separate meeting was held at the Human Space Flight (HSF) Network Support Group (NSG) on this issue. Action items were assigned at that time.

D. Integrated Network Element Status

1. Network Integration Center (NIC). Mr. Riley provided a NIC status.
 - (a) There have been no software or hardware operational changes since the Soyuz 26 MORR.
 - (b) There are no open Discrepancy Reports (DR).
 - (c) There is no open work.
 - (d) There are no projected changes.
 - (e) Staffing is sufficient to meet all requirements.
 - (f) Documentation is up to date.
 - (g) Mr. Scott Greatorex asked if there will be critical periods during the Soyuz support. Mr. Riley stated that orbits 6 – 8 (interfaces with the VHF sites) are critical periods. Mr. Greatorex stated that if there are critical periods, then the package should contain a list of the Freeze Exemption Requests (FER). Mr. Bangerter agreed and the package will be updated.
 - (h) Mr. Riley stated that the NIC is ready to support Soyuz-27.
2. Space Network (SN)/WSC. Mr. David Glasscock provided a SN/WSC and WSC VHF status.
 - (a) Mr. Glasscock reviewed the software updates since the last MORR. Space Network Access System (SNAS) Release 4 transition occurred on March 10,

2011. The IR frequency search modification software was delivered to Space to Ground Link (SGLT)-2 Automated Data Processing Equipment (ADPE) on March 18, 2011.
- (b) Mr. Glasscock reviewed the hardware changes since the last MORR. Second Tracking and Data Relay Satellite System (TDRSS) Ground Terminal (STGT) MOVE is currently shadowing the legacy system. Cable and power installation has taken place at the White Sands Ground Terminal (WSGT). WSGT and the Guam Remote Ground Terminal (GRGT) remain on the legacy system. IRS modems have been installed in SGLT-4, 5, and 6. TDRS-K work continues (WSGT rack and cable installations). IR modification firmware was delivered to SGLT-2 B side on March 3, 2011.
 - (c) Mr. Glasscock reported that there is one open DR on the Guam Data Information System (GDIS)-R. This was an STS-133 In Flight Anomaly (IFA). WSC is working with RT Logic on the problem. The problem occurred once with the ISS and several times during STS-133.
 - (d) Mr. Glasscock stated that there is no open software work and that there is MOVE, TDRS-K, IR switch, and IRS modem open work.
 - (e) Mr. Glasscock reported that there are no projected changes.
 - (f) Mr. Glasscock provided a status of the TDRSS fleet.
 - (1) TDRS-4 (TDS) Ku-band Single Access (KSA-2). The KSA forward Service is 5.7 dB below specification for Normal Power operations and 4.8 dB below specification for High Power operations. A spare Traveling Wave Tube Amplifier (TWTA) is available.
 - (2) TDRS-4 (TDS) Telemetry Errors. SGLT-1/TDRS-4 downlink has been experiencing irregular, apparently random telemetry errors with minor user data loss. The SGLT spare TWTA1 was replaced on March 17, 2011, because trending data indicated a possible failure in April. Mr. Bangerter asked if there are still telemetry hits. Mr. Glasscock stated that there have been none and the problem seems to have been fixed.
 - (3) TDRS-4 (TDS) Power Systems Degradation. Battery 1 has failed and battery 2 has shown signs of soft shorts in at least one cell. The Spring 2011 eclipse season was January 20 through March 23. Service degradation was experienced on the SA1 and Multiple Access Forward (MAF) services. Services were restored at the end of the Eclipse season.
 - (4) TDRS-4 (TDS) Intermittent MA Element Issues. MA elements 4, 10, 16, 22, and 28 have been intermittently disappearing. The system is designed to meet specifications with 20 of 30 elements operational. There has been no data loss directly attributable to the anomaly.
 - (g) Staffing is sufficient to meet all requirements.
 - (h) Documentation is up to date.
 - (i) Mr. Glasscock stated that the SN/WSC is ready to support Soyuz-27.
 - (j) Mr. Glasscock provided a WSC VHF status. There have been no operational changes since the Soyuz 26 MORR. There are three open DRs related to the noisy downlink and antenna pointing failure. DR 259441 is on the antenna elevation failure. The controller rate change issue has been resolved. Three passes have been supported. Additional engineering passes will be scheduled.

Mr. Bangerter stated that the antenna status can be changed to YELLOW as the Antenna Control Unit (ACU) issue is resolved. Ms. Melissa Blizzard stated that the cable replacement effort could turn the antenna status to RED. Mr. Glasscock stated that WSC has mitigation for the cable work. Mr. Brad Butts asked if there are criteria for YELLOW versus RED. Mr. Bangerter stated that RED is cannot support and YELLOW is marginal support. Mr. Marco Midon asked why it was originally suspected that the HPA was the problem. Mr. Bangerter stated that there were engineering discussions at the NSG, but he would like Mr. Midon and Mr. William R. Jones to be involved as the work continues. Open work is related to the audio recording capability implementation. Projected changes are related to the same effort. Staffing is sufficient to meet all requirements. Documentation is up to date. Mr. Glasscock stated that WSC VHF systems are ready to support Soyuz-27.

3. WGS. Mr. Mark Harris provided a WGS status. There have been no software or hardware operational changes since the Soyuz 26 MORR. There are no open DRs. There is no open work. There are no projected changes. Staffing is sufficient to meet all requirements. Documentation is up to date. Mr. Harris reported that the problem with the UPS was found. The system is operational. The UPS coil had been damaged during power work on the station. The station will go back to commercial power on April 5 with the backup generator in place. Mr. Harris stated that WGS is ready to support Soyuz-27.
4. DFRC. Mr. Justin Thomas reported that there have been no software or hardware operational changes since the Soyuz 26 MORR. There are no open DRs. There is no open work. There are no projected changes. Staffing is sufficient to meet all requirements. Documentation is up to date. Mr. Thomas stated that DFRC is ready to support Soyuz-27.
5. NASA/DoD C-bands Eastern Range (ER). Mr. Mike Gawel provided an ER resources status. There have been no software or hardware operational changes since the Soyuz 26 MORR. There are no open DRs. There is no open work. There are no projected changes. The following NASA/DoD radars will be available: MLAC, JDIC, and WLPC. The plan is to use MLAC, JDIC, and WLPC for Orbit 6. MLAC, JDIC, and WLPC will track Orbit 6 and provide Low Sample Rate (LSR) data to the FDF. Staffing is sufficient to meet all requirements. Documentation is up to date. Mr. Bangerter reported that at the NSG, a C-band communications contingency procedure was presented and reviewed. If the procedure is ready, Soyuz 27 will not have C-band support for nominal operations. If the procedure is not ready, support will be as it has been. Mr. Gawel stated that ER resources are ready to support Soyuz-27.
6. NASA Integrated Services Network (NISN). Ms. Sharon Damiano provided the NISN status.
 - (a) There have been no software or hardware operational changes since the Soyuz 26MORR.
 - (b) There have been no changes to the Marshall Space Flight Center (MSFC) Russian Services activities.
 - (c) There are no Problem Management and Dispatch System (PMDS) tickets.
 - (d) There is no open work.

- (e) There are no projected changes.
 - (f) Staffing is sufficient to meet all requirements.
 - (g) Documentation is up to date.
 - (h) NISN will process all FERs during the mission in accordance with NISN SOP-002.
 - (i) Ms. Damiano stated that NISN is ready to support Soyuz-27.
7. FDF. Ms. Nikki Wilcox reported there have been no software or hardware operational changes since the Soyuz 26 MORR. There are no open DRs. Open work consists of verifying receipt/processing of Soyuz-27 Two Line Elements (TLE) by VHF sites. There are no projected changes. Staffing is sufficient to meet all requirements. The Soyuz-27 Mission Support Plan will be delivered by March 24, 2011. Ms. Wilcox reported that the FDF has compared the Russian vectors and they are consistent with ours. This has been documented 3 or 4 times now. Ms. Wilcox stated that FDF is ready to support Soyuz-27.
8. Integrated Network Summary. Mr. Riley provided an IN summary.
- (a) Mr. Riley reviewed the requirements/test matrix.
 - (b) Mr. Riley reviewed the one risk (VHF-2). VHF-2 is not periodically End-to-End (ETE) tested. The FAA has refused to allow the use of the restricted frequency for periodic VHF-2 system validation. The last VHF-2 ETE Comm check was performed in September 2004.

BOARD COMMENTS

Mr. Lehtonen polled the Review Board for their comments. All the board members stated that the network is ready to support Soyuz-27

ACTION ITEM REVIEW

One action item was assigned at the April 5, 2011, Soyuz-27 MORR.

AI No.	Assignee	Action	Due Date
0411-Soyuz MORR-01	Kevin Riley/ GSFC/ HSF	Provide a WSC transmit and receive recording capability implementation completion date.	Open

RFA REVIEW

No Requests for Action (RFA) were assigned at the April 5, 2011, Soyuz-27 MORR.

(Original Approved By)
 James A. Bangerter
 GSFC/NASA/450.1
 HSF ND

Kevin Riley
 GSFC/HSF/NOM