

SUBJECT: Soyuz-26, Expedition 27 / Increment 27 MORR Minutes

DATE: February 9, 2011

PLACE: Goddard Space Flight Center, B12/Rm E231

TIME CONVENED: 1300

TIME ADJOURNED: 1345

ATTENDANCE

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INTRODUCTION

Ms. Melissa Blizzard convened the Soyuz-26, Expedition 27 / Increment 27 Mission Operations Readiness Review (MORR) to review Integrated Network (IN) element mission operations readiness (refer to the presentation, *Soyuz-26, Expedition 27 Increment 27 Mission Operations Readiness Review [MORR]*). This MORR covers changes and updates to the network since the Soyuz-25 MORR.

MEETING ITEMS

A. Welcome/Introduction

1. Ms. Blizzard reviewed the agenda for the MORR.
2. Ms. Blizzard 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. Jim Bangerter signed for).
 - 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).
 - Mr. Gary A. Morse, 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. Ms. Blizzard 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 Launch Profile. He stated that the launch is scheduled for March 30, 2011 at 0043 GMT. Docking to the International Space Station (ISS) will be April 1, 2011. The Soyuz will remain docked for approximately 6 months at which time it becomes the Russian Crew Return Vehicle and is replaced by Soyuz-27 in May 2011.
2. Mr. Riley reviewed ISS assembly sequence which shows the different increments.

C. Integrated Network (IN) Overview

1. Mr. Riley reviewed the ISS/Soyuz IN Overview diagram. Mr. Riley stated that the diagram is color coded to show the U.S. segment and the Russian segment.
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.
3. Mr. Riley stated that there have been no Program Requirement Document (PRD) changes.

4. Mr. Riley reviewed the Operational/Network Changes.
 - (a) The Near Earth Network Services (NENS) contract is transitioning to the Space Communications Network Services (SCNS) contract. The transition will occur on April 9, 2011. Mr. Riley reviewed the organizations affected by the transition.
 - (b) WGS and the White Sands Complex (WSC) will implement Very High Frequency (VHF) recording capability. WGS will implement VHF-1/2 transmit and receive recoding via the Mission Operations Voice Enhancement (MOVE) system on February 25, 2011. WSC will implement approved Engineering Change (EC)-Task Order (TO) 015-4 VHF-1/2 transmit and record capability on March 1, 2011.
 - (c) Mr. Gary Morse asked if WSC will have MOVE by the time of the implementation. Mr. Ben Smith replied that the Second Tracking and Data Relay Satellite System (TDRSS) Ground Terminal (STGT) will and that he was not sure of the WSC MOVE schedule. Mr. Jim Bangerter stated that WSC will be conducting MOVE shadow operations in April 2011.
5. Mr. Riley provided a Network Verification Test summary.
 - (a) Monthly VHF-1 two-way voice checks were conducted with ISS and WGS on January 10; with the Dryden Flight Research Center (DFRC) on January 13 and February 4; and with WSC on January 14 and February 4.
 - (b) WSC support was unacceptable due to excessive noise on the system 1 downlink. The system 1 Power Amplifier (PA) is suspected. A new PA was ordered on January 25 and is expected in 4 – 6 weeks. The system was then turned YELLOW.
 - (c) The WSC VHF antenna experienced a blown fuse in the antenna elevation motor after an ISS pass on February 4. Temperatures at WSC were in the minus 15 degree range. WSC conducted a simulated pass when temperatures warmed up and the antenna performed to specifications. Mr. Bangerter stated that an investigation is underway and the antenna specifications, temperature, lubricants, and any other things that can affect motor movement are being looked into. (Editor's Note: A meeting was held on February 9 and six action items were assigned. The action items are provided, for reference, at the end of these minutes.)

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 last 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. Riley stated that the NIC is ready to support Soyuz-26.
2. Space Network (SN)/WSC. Mr. Ben Smith provided a SN/WSC and WSC VHF status.
 - (a) Mr. Smith reviewed the software updates since the last MORR. Software delivery 10006 will be completed on February 16 and contains maintenance and TDRS-K

specific items. Space Network Access System (SNAS) Release 4 will be completed in March (post STS-133). An Operational Readiness Review (ORR) is being planned.

- (b) Mr. Smith reviewed the hardware changes since the last MORR. The MOVE system replaces the obsolete Multi-conference Digital Switch (MDS) at WSC. The STGT MOVE system is currently shadowing the legacy system. The White Sands Ground Terminal (WSGT) and Guam Remote Ground Terminal (GRGT) remain on the legacy system. The antenna Sub-System Controller (SSC) replacement is still ongoing.
 - (c) Mr. Smith reported that there are no open DRs.
 - (d) Mr. Smith stated that there is no software open work and that the MOVE and antenna SSC replacement remain as hardware open work.
 - (e) Mr. Smith reported that there are no projected changes.
 - (f) Mr. Smith provided a status of the TDRSS fleet.
 - (1) TDRS-4 (TDS) Power Systems Degradation. The current eclipse season is January 20 through March 23, 2011. There have been no issues. The eclipse season will be over prior to the Soyuz launch.
 - (2) TDRS-4 (TDS) Telemetry Errors. TDRS-4 downlink has been experiencing irregular, apparently random telemetry errors with minor user data loss. A spare Traveling Wave Tube Amplifier (TWTA) is available.
 - (3) TDRS-4 (TDS) Ku-band Single Access (KSA-2). The KSA-02 forward Service is 5.7 dB below specification for Normal Power operations and 4.8 dB below specification for High Power operations. A spare TWTA is available.
 - (g) Staffing is sufficient to meet all requirements.
 - (h) Documentation is up to date.
 - (i) Mr. Smith stated that the SN/WSC is ready to support Soyuz-26.
 - (j) Mr. Smith provided a WSC VHF status. There have been no operational changes since the last MORR. There are three open DRs related to the noisy downlink and blown motor fuses. The audio recording capability implementation is the only open work. The audio recording capability and new PA replacement are the only projected changes. Staffing is sufficient to meet all requirements. Documentation is up to date. Mr. Glasscock stated that WSC VHF systems are ready to support Soyuz-26.
3. WGS. Mr. Mark Harris provided a WGS status. WGS will be transitioning to upgraded Windows XP version of the Wallops Orbital Tracking Resource Scheduler (WOTRS). WGS will be implementing the MOVE transmit and receive audio recording capability. Some modules have been installed and working well. The legacy system will be removed post STS-133. Mr. Morse asked if there are criteria for the retention of the recordings. Mr. Riley stated that the TDRSS Network Operations Support Plan (TNOSP) is being updated for the new capability and that the document already has the retention requirements that will be modified to include the MP3 recordings. 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 stated that WGS is ready to support Soyuz-26.
4. DFRC. Mr. Douglas Boston reported that there have been no software or hardware operational changes since the last 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. Boston stated that DFRC is ready to support Soyuz-26.
5. NASA/DoD Radars C-band Eastern Range (ER). Mr. Mike Gawel provided an ER resources status. There have been no software or hardware operational changes since the last 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 Flight Dynamics Facility (FDF). Staffing is sufficient to meet all requirements. Documentation is up to date. Mr. Gawel stated that ER resources are ready to support Soyuz-26.
 6. NASA Integrated Services Network (NISN). Mr. Al Duany provided the NISN status.
 - (a) There have been no software operational changes since the last MORR.
 - (b) The OC-12s have been upgraded for support of the HSF requirements. With the carrier's infrastructure upgrade to OC-12's between GSFC/WSC, JSC/WSC, and GSFC/Marshall Space Flight Center (MSFC), hardware between these sites has been upgraded to support OC-12's. The OC-12's replace the GSFC/WSC OC-3 (transitioned 01/31/11), JSC/WSC OC-3 (transitioned 01/17/11), and the two DS-3's between GSFC/MSFC (transitioned 12/28/10).
 - (c) Mr. Duany provided a review of the MSFC Russian Services Group (RSVG) activities.
 - (d) There are no PMDS tickets.
 - (e) There is no open work.
 - (f) There are no projected changes.
 - (g) Staffing is sufficient to meet all requirements.
 - (h) Documentation is up to date.
 - (i) NISN will process all Freeze Exemption Requests (FER) during the mission in accordance with NISN SOP-002.
 - (j) Mr. Duany stated that NISN is ready to support Soyuz-26.
 7. FDF. Ms. Nikki Wilcox reported there have been no software or hardware operational changes since the last MORR. There are no open DRs. Open work consists of verifying receipt/processing of Soyuz-25 Two Line Elements (TLE) by VHF sites. There is no projected work. Staffing is sufficient to meet all requirements. The Soyuz-26 Mission Support Plan will be delivered by March 23, 2011. Ms. Wilcox stated that FDF is ready to support Soyuz-26.
 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. There is a test plan. The mitigation for this risk is on hold. The use of the U.S. restricted frequencies is being revisited by the JSC Spectrum Management.

BOARD COMMENTS

Mr. Lehtonen polled the Review Board for their comments. All the board members stated that the network is ready to support Soyuz-26.

ACTION ITEM REVIEW

No action items were assigned at the February 9, 2011, Soyuz-26 MORR.

WSC VHF ACTION ITEMS

The following action items were assigned at the February 9, 2011, WSC VHF meeting.

AI No.	Assignee	Action	Due Date
020811-WSC VHF-01	David Glasscock/ WSC	Check the VHF sparing status and provide the status to Mr. Kevin Riley.	02/25/11
020811-WSC VHF-02	Pat DeLong/GSFC	Contact the motor manufacturer, M2, to get information pertaining to the fuses, grease, and temperatures issues. Get copies of the motor specifications.	03/11/11
020811-WSC VHF-03	David Glasscock/ WSC	Check the specification for the spray lubricant used on the WSC antenna chains (.e.g., temperature tolerances).	02/25/11
020811-WSC VHF-04	Kevin Riley/ GSFC/HSF	With WSC, develop a troubleshooting plan for beyond implementing the PA fix.	02/25/11
020811-WSC VHF-05	Melissa Blizzard/ GSFC/HSF	Determine the level of forward work on the VHF-1 separate system that can be performed at WSC (what can and cannot be worked).	02/18/11
020811-WSC VHF-06	Pat DeLong/GSFC	Complete the EL motor evaluation and provide a report and recommendations to Mr. Jim Bangerter.	02/28/11

RFA REVIEW

No Requests for Action (RFA) were assigned at the February 9, 2011, Soyuz-26 MORR.

(Original Approved By)

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GSFC/HSF

Kevin Riley
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