



**Human Spaceflight (HSF)
Network Support Group (NSG)
Meeting
May 6, 2010**



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Network Support Group (NSG)
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May 6, 2010

**Johnson Space Center (JSC), TX
Regents Park III Building**

A handwritten signature in black ink that reads "James A. Bangerter". The signature is written in a cursive style and is underlined.

James A. Bangerter
Human Spaceflight Network Director
Goddard Space Flight Center

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The attendees listed below attended all or part of the May 3 – May 6, 2010 NSG (splinter sessions and/or main forum).

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Network Support Group Minutes

INTRODUCTION

Mr. Jim Bangerter convened the May 6, 2010, Human Spaceflight (HSF) Network Support Group (NSG) meeting to discuss requirements, planning, and issues in support of the Space Shuttle, International Space Station (ISS), and Visiting Vehicles (VV). Mr. Bangerter welcomed the attendees and thanked them for their attendance at the NSG.

Mr. Bangerter stated that during STS-130, the Mid-Atlantic region had a huge snow storm and a large contingent of personnel at the Goddard Space Flight Center (GSFC) was snowed in. The Johnson Space Center (JSC) Flight Directors (FD) chose GSFC to be recognized for its efforts. GSFC representatives Mr. Jim Bangerter and Ms. Melissa Blizzard participated in the JSC Mission Control Center (MCC) mission plaque handing ceremony by holding the ladder; a great honor. JSC presented GSFC with a mission collage and mission plaque signed by the crew members. He asked that those in the room who were part of the GSFC contingent from Integrated Network (IN) elements such as the Network Integration Center (NIC), Flight Dynamics Facility (FDF), and the NASA Integrated Services Network (NISN) stand to be recognized.

Mr. Bangerter stated that he had some Group Achievement Awards that he had not distributed for Return to Flight that he would distribute to the representatives from the Dryden Flight Research Center (DFRC), Merritt Island Launch Annex (MILA), Wallops, and White Sands Complex (WSC) so that they might carry them back to their respective sites to distribute.

Mr. Bangerter stated that he had a Group Award for Mr. Cliff Gatewood from the Onizuka Air Station (OAS) who has provided the HSF program with excellent support for many years. He also presented Mr. Gatewood with an autographed picture of the STS-125 crew.

Mr. Bangerter stated that STS-132 will be the last mission for the Air Force Satellite Control Network (AFSCN) Remote Tracking Sites (RTS). The Air Force has supported the Space Shuttle Program (SSP) from the beginning as arranged by previous Network Director (ND) Mr. Gary Morse. Due to the efforts of the Base Closure and Realignment Commission (BRAC), OAS will close. As the SSP is moving to retirement, the cost of moving operations/connectivity to the Vandenberg Air Force Base (VAFB) was too high for the time remaining in the program and the program elected not to move. During the last mission (STS-131), K-band operations were lost and the Air Force provided vital support. He thanked them for their support to the program over the years.

May 2010 NSG splinter session and main forum presentations and minutes can be accessed at the following URL: <http://scp.gsfc.nasa.gov/hsfnsng/nsg/0510/nsg.htm>

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HSF RAIL REVIEW

Mr. Steven Testoff provided a review of the HSF Rolling Action Item List (RAIL) (refer to the presentation, *Human Spaceflight [HSF] Action Item Status*). Mr. Testoff reported that there were 18 meetings with open Action Items (AI) for a total of 27 open items, 4 over due items, and 3 meetings with overdue items. He thanked the attendees for their responsiveness leading up to the NSG as there had been many more open items which have been closed in the past few weeks. Mr. Testoff reviewed the open action items which will be updated in the next RAIL. From the discussion, it was possible to close 4 AIs.

HSF DOCUMENTATION STATUS

Mr. Earl Daniel provided an HSF documentation status (refer to the presentation, *Human Space Flight Documentation Status/Plan*).

- A. Mr. Daniel stated that HSF documentation goes through several levels of review; local team review, general review, and GSFC Configuration Control Board (CCB) review.
- B. Mr. Daniel reviewed the documents updated/published since the last NSG. Several documents were updated/published including the *Network Operations Directive for Human Space Flight Network Support*, 450-NOD-HS; *Tracking and Data Relay Satellite Systems Network Operations Support Plan for the International Space Station (ISS)*, 450-TNOSP-ISS; *H-II Transfer Vehicle (HTV) Annex to the Tracking and Data Relay Satellite System Network Operations Support Plan for the International Space Station (ISS)*, 450-TNOSP-ISS, HTV Annex; and the *Human Spaceflight Program Emergency Mission Control Center Activation and Operations Procedures*, 450-CAP-EMCC and supplement.
- C. Mr. Daniel stated that the *Tracking and Data Relay Satellite System Network Operations Support Plan for the Space Shuttle*, 450-TNOSP-Space Shuttle is in CCB review. This was a large effort. Several annexes will be added. The Dragon annex is ready for update. The *Network Operations Support Plan for the Space Shuttle Program*, 450-NOSP-Space Shuttle Documentation Change Notice (DCN) 003 was changed to a revision due to the size of the DCN package at the request of the Code 450 Networks Integration Management Office (NIMO) HSF configuration manager. The document has been sent out for general review to verify the change to revision and will be submitted to CCB.
- D. Mr. Daniel reviewed the documents in general review and local review.
- E. Mr. Daniel discussed the document updates scheduled for the next Fiscal Year (FY). He reviewed the Documentation Plan table which provides the document, edition, review start date, date due back from review, planned completion date, remarks, and book manager name.
- F. Mr. Daniel stated that there will be upcoming discussions on which documents to archive and which will need update when the SSP ends. Mr. Morse stated that the Network Operations Directive (NOD) contains Constellation Program material and asked if the data will be pulled from the NOD. Mr. Daniel stated that he believes that is the intent. Mr. Bangerter stated that the NOD will be updated when the Constellation program is officially canceled. Mr. Marriott stated that a revision should be planned for next year to remove the SSP and update Orion as necessary.

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- G. Ms. Angela Culley stated that there was a presentation at the last NSG in regards to the responses to document reviews and CCBs and asked if the responsiveness has improved. Mr. Daniel replied that he believes it has. He stated that the number of documents produced since the last NSG is fantastic and thanked the network for its support.

NSG SPLINTER SESSION SUMMARIES

Each splinter Chairperson or designee was asked to provide a brief summary of the splinter session activities.

- A. DFRC Network Command Processing System (NCPS) Replacement Status (refer to the presentation, *DFRC Shuttle Upgrade Splinter Summary*). Mr. Gregg Bergman stated that the DFRC upgrades went very well. The Aeronautical Tracking Facility (ATF)-1 and -2 systems are network certified for Space Shuttle support. Personnel have been trained. The systems have been released to operational status. There is one outstanding action item. GSFC engineering will look at the hang-up with the Fastcom Serial Communications Controller (FSCC) card in the Dryden Apple Replacement System (DARS) when switching between 192- and 96-kbps. A workaround is in place.
- B. Tracking and Data Relay Satellite (TDRS) Eccentricity (refer to the presentation, *Open Loop Link Margin Testing and TDRS Eccentricity Impacts Meeting*). Ms. Michelle Bullard and Mr. Randal Morgan provided a splinter session summary. The purpose of the test is to define the current ISS link margin for the Ku-band antenna, update the Flight Rules regarding allowed pointing vector error with accurate values based on the determined link margin, and to extrapolate/confirm what effect increased TDRS eccentricity will have on the ISS link margin. The group discussed the previous link margin tests, methods, and faults. The current Flight Rules allowable pointing vector errors are very near or are already being violated. The Flight Rules will be updated. The only real way to fix the problem is to update the onboard Guidance, Navigation, and Controls (GNC) Multiplexer/Demultiplexer (MDM) software. Boeing is looking at the software to see if eccentricity can be added. The Trajectory Operations Officers (TOPO) are working this effort. The group discussed how to conduct the link margin tests; two tests are needed. Testing may impact Ku-band users; therefore, the testing will be conducted during the crew sleep period. WSC does not want to delay the satellite maneuvers which are planned (to change the TDRS eccentricity) for too long. The ISS test results will be known in a month or so. An abbreviated test was conducted previously and has led to the conclusion that the link margin is better than believed. Use of TD 275 was discussed. The group wants to include TD 275 in the analysis as it has the most eccentricity to date. The return link is not needed for the test. Mr. Joe Whitney will be the lead Ground Controller (GC). A Briefing Message (BM) will be needed. The Spacecraft Mission Managers (SMM) will work with FDF.
- C. AMS Program Requirements Document (PRD) (no presentation). Mr. Ken Jones stated that he had received a lot of requirements that were not in the PIP Annex 5. Of 14 requirements received, 7 were deleted, and 4 are being updated. Actions were taken to delete the requirements and verify the remaining requirements.

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- D. Automated Transfer Vehicle (ATV)-2 (refer to the presentation, *Automated Transfer Vehicle [ATV-2] Mission Planning Status Summary*). Mr. Erik Richards reviewed the splinter agenda and reported that the launch date has changed to December 6 (work toward date) with docking on December 17. Undocking would be May 10, 2011 and reentry would be on May 10, 2011, 4.5 orbits after undocking. Discussion highlights included Space Network (SN) support, C-band, FDF, and NISN support. C-band support will be 5 passes as in the PRD. Five action items were taken. Mr. Morse asked if five C-band passes is consistent with ATV-1. Mr. Joe Aquino stated that ATV-1 had extra passes for the demonstrations and GPS checkout. These activities are not being conducted this time so the 5 passes should be adequate.
- E. Obsolescence Driven Avionics replacement (ODAR) Status (refer to the presentation, *ODAR Splinter*). Mr. Chris Neman reported that two splinter sessions were held; one to discuss the schedule in detail and the regular ODAR Working Group (WG). The attendees reviewed the integrated schedule and identified high-level test plan and milestones. Overall test objectives and roles and responsibilities were agreed to for each milestone. The schedule will be updated to increase onboard milestones/dependencies in the ground portion. The NISN ISS IP Ground Routed Network (IIGoR) schedule was discussed. The goal of minimizing dual circuit costs to the ISS Program (ISSP) during transition was discussed. At the time of the splinter this item was still under investigation, but NISN has decided that the original ISS Downlink Enhancement Architecture (IDEA) decommissioning date will be held (June 2011). The ISSP will have to pay to keep the IDEA network up in parallel after June 2011. NISN will provide a cost estimate. Messrs Ray Sparks and Chris Neman will develop a transition plan to include decommissioning IDEA. The WG discussed expectations for the Critical Design Review (CDR). Each center presented their high-level design and assumptions. Technical dependencies were identified. The Ground Segment (GS) CDR is currently scheduled for June 30, 2010. No major issues were identified.
- F. Orbital Sciences Corporation (OSC) – Cygnus (no presentation). Ms. Cheryl Smith reported that a status of network testing was discussed. A documentation status was provided. A Network Operations Support Plan (NOSP) and Interface Control Document (ICD) are being developed. Network configuration changes were reviewed and several actions were assigned.
- G. Kennedy Forward/Return Link (KFRL) (no presentation). Mr. John Steffes reported when the SSP ends, the Kennedy Space Center (KSC) needs to be prepared to see if KFRL forward link assets can be used for other projects/programs or if it can be used with the Communications Data & Switching Center (CD&SC). Looking forward a good inventory of documentation, Software, hardware, etc. is needed. Over all it was a good meeting.
- H. SpaceX (no presentation). Mr. Harrison Booker reported that the SpaceX vehicle will resupply the ISS and two demonstrations flights are scheduled for 2010 and one for 2011. The Demo C-1 flight profile was reviewed. The support for the projected 3 launch attempts per day was discussed. Overall network requirements and status was reviewed. The network is ready to support the mission.

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- I. Very High Frequency (VHF) Status (refer to the presentation, *VHF Ground Station Status Summary*). Mr. Kevin Riley reviewed the splinter session agenda. The purpose of the meeting was to look at the sustaining effort needed for VHF systems through 2020. The system meets requirements. The VHF-2 testing is still being worked. Minimum United States VHF support is anticipated for ISS crew evacuation. The evacuation is planned over Russian range. DCN 002 of the Tracking and Data Relay Satellite System (TDRSS) NOSP (TNOSP) VHF annex is in work. An ISS VHF summary will be submitted by each station after a VHF Emergency Communications Verification pass or series of passes. System Readiness Tests (SRT) will be conducted on a bi-monthly basis. Mr. Bangerter stated that he thought he had asked SRTs to be conducted one a week. Mr. Riley responded that the Wallops Flight Facility (WFF) and WSC wanted the SRTs every other week. Mr. Mike Yettaw stated that DFRC will continue with weekly SRTs. Mr. Bangerter stated that he would like to discuss the rationale for WSC going to every other week. The status of the Modular Repair Facility at GSFC was discussed and an action item assigned to determine its future status. Three action items were discussed, but two can be canceled due to previous actions.
- J. Mission Operations Voice Enhancement (MOVE). Ms. Michele Mascari provided a summary (no presentation). Ms. Mascari reported that a status and review of Lessons Learned (LL) was provided. She presented a transition status. GSFC is 60 percent complete. She noted that JSC calls its MOVE switch the Digital Voice Inter-Communications Equipment (DVICE). One action item was assigned. Mr. Ken Jones reviewed the transition plan (4 of 9 phases are complete). Keyset cutover will begin July 13. JSC is working a couple of issues.
- K. STS-132/133 Mission Planning (refer to the presentation, *STS-132/133 Mission Planning Integrated Networks Status Summary*). Mr. Erik Richards reported that STS-132 will be the last mission supported by the AFSCN. The NCPSs will be removed post STS-132. Two issues were discussed (invalid configuration codes for SUPIDEN M8020MS and the problems with the JS2 line drop). No action items were assigned.
- L. H-II Transfer Vehicle (HTV)-2 (refer to the presentation, *H-II Transfer Vehicle [HTV-2] Summary*). Mr. Erik Richards reported that HTV second generation transponder testing, possible change to the Radio Frequency (RF) ICD, and HTV-2 network mission status were discussed. The transponder is TDRSS compatible. There were no action items.
- M. WFF NCPS Replacement Status (refer to the presentation, *Wallops NCPS Replacement*). Mr. Mark Harris reported that the meeting was held to review the status of the replacement of the obsolete Wallops NCPS system with an Avtec 1/3 rate capable Programmable Telemetry Processor (PTP). Discussion included a schedule review, Portable Spacecraft Simulator (PSS) and on-orbit test review, STS-132 support plans, and equipment transfer to MILA. No action items were assigned.
- N. Nortel Router Replacement Project (NRRP) (no presentation). Mr. Chris Spinolo stated that a project introduction was provided and the project is working toward a Preliminary Design Review (PDR). A discussion was held on local site support and Mr. Spinolo has an action to take this discussion back to GSFC.

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- O. HSF Comm (HSFC) WG. Ms. Angela Culley provided a summary (refer to the presentation, *Human Spaceflight Comm Working Group*). Ms. Culley reported that the IIGoR network will hold to its July 16 start date. This will allow for transition of current services to the OC-12 prior to STS-133. The ISSP will incur cost to keep IDEA circuits active after June 2011. Newly installed Amino boxes for ISS video continue to freeze at the Canadian Space Agency (CSA) and Marshall Space Flight Center (MSFC) Huntsville Operations Support Center (HOSC). The customer is not happy with the service. Two action items were assigned. Mr. Aquino stated that NISN needs to continue to work the freeze frame problem.
- P. NISN Turndown (refer to the presentation, *Shuttle Retirement – NISN*). Ms. Culley stated that the purpose of the splinter session was to discuss expectations and forward work required to disconnect Space Shuttle NISN services. The existing requirements process will be used. All Space Shuttle turndown of services will flow through the Mission Customer Interface Group (CIG) at GSFC for validation. Determination of a Space Shuttle NISN service remaining in place requires coordination by NASA. NISN will support customer discussions, provide PSLAs, and voice assignments. The Network and Communications Analysis and Integration Team (NACAIT) will work the corporate side. No formal action items were assigned, but the customers will provide Ms. Culley with a point-of-contact for coordination of these efforts and Ms. Culley will provide Ms. Monique McLamb with a list of Shuttle NISN services at the KSC. Mr. Morse asked if the services will just be turned down if no other user steps forward. Ms. Culley stated that the service lists will be scrubbed as thoroughly as possible and it will be up to NISN to put in disconnect requests.
- Q. SSP Closeout (refer to the presentation, *Shuttle Going out of Business Summary*). Mr. Ed Richards provided a summary. NASA HSF management was provided a cost estimate for Space Shuttle close out on the network. The estimate included removing the External Tank (ET) TV equipment from the Jonathan Dickinson Missile Tracking Annex (JDMTA) and returning it to GSFC, removing and returning equipment from White Sands Space Harbor (WSSH) to Wallops, returning the PSS transponder to JSC, and removing Space Shuttle unique equipment and code from WSC systems. Select equipment will be removed from MILA/Ponce deLeon (PDL) and sent to Wallops. DFRC will remove Space Shuttle unique equipment and excess locally.
- R. SSP Knowledge Capture (refer to the presentation, *Network Operations Integration Team Shuttle Knowledge Capture Splinter Meeting Summary*). Mr. Mike Marsh provided a summary. This is an internal project at JSC not funded for network support. The group discussed the purpose and scope of the project and what types of network data would be captured. The project is attempting to capture documents and processes. Mr. Marsh stated that the JSC GC is approximately 50 percent network oriented and the Flight Team does not realize this. He stated that he has gained a greater understanding of what will be needed. Mr. Marsh stated that he tried to develop a checklist using the old Lead GC Checklist. This checklist was used for GC training. He stated that he would like to see something similar from the other network elements. The group discussed whether there are other efforts underway at the other centers/sites. An action item was assigned for

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Ms. Jewel Hervey and Mr. Joe Aquino to go back to the SSP to see if this will become a program initiative or whether the network is on its own. The goal is to be complete by end of the FY. Mr. Dave Theriault stated that he has a task to provide a cost and that he will discuss this with Mr. Marsh.

- S. STS-131 Post Mission Review (PMR) (no presentation). Ms. Blizzard stated that there were nine open items and one was closed. If any of the eight remaining items become major items, they will be tracked via the HSF RAIL.

SN STATUS

Mr. Johnny Chavez presented an SN status (refer to the presentations, *TDRS Constellation Status WSC Software and Hardware Activities*).

- A. Mr. Chavez reviewed the current TDRS configuration (satellite locations). TD-3 is in storage.
- B. Mr. Chavez provided a fleet status. TDRS-1 has been decommissioned and will be placed in supersynchronous orbit. A raising plan is underway. TDRS-3 was positioned at 49 degrees West and placed in storage. The TDRS-3 Space-to-Ground Link (SGL) dedicated downlink Traveling Wave Tube Amplifier (TWTA) helix current rising problem has led to turning off the TWTA which will be reactivated at a later date. TDRS-4 K-band Single Access (KSA)-2 forward power is below specification. A spare TWTA is available. TDRS-4 is experiencing telemetry errors. A spare TWTA is available. TDRS-4 is experiencing intermittent Multiple Access (MA) element problems. There has been no loss of data. This could affect some VV. TDRS-4 has experienced power degradation. Battery 1 has failed and battery 2 has shown signs of a soft short in at least one cell. Some restrictions were applied during the last eclipse period. Services were re-enabled early. It is expected that the services will be available during the next eclipse period. Mr. Chavez discussed TDRS eccentricity management. The planned maneuvers have been suspended for now and a new maneuver plan is being worked.
- C. Mr. Chavez provided a WSC hardware status. MOVE will replace the current Multi-Conference Digital Switch (MDS). Recorders will be installed at the Second TDRSS Ground Terminal (STGT) and White Sands Ground Terminal (WSGT). WSC would like to accelerate this process due to increased MDS failures. The current projected completion date is August 2010. The current High Rate Data Switch (HRDS) is being replaced due to obsolescence and maintainability issues. The legacy switches have been removed. A de-jitter firmware fix for all customers was installed in April 2010. The Guam Data Interface System Replacement (GDIS-R) will replace the GDIS due to obsolescence issues. The new system will allow automatic failover of DS-3 traffic to backup DS-3. The project is in Phase 3 now. The MDMs will be replaced. Mr. Aquino asked if this new system will open up the 8-Mbps restriction at Guam. Mr. Chavez replied that it will not. The TDRSS Operations Control Center (TOCC) is being upgraded; all controller positions will be relocated to STGT. This should be complete by the end of June 2010. The antenna Subsystem Controllers (SSC) are being replaced. New units are being tested in the Software Maintenance and Test Facility (SMTF). STGT should be complete by June 2010.

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D. Mr. Chavez provided a WSC software status. SW deliveries 08012 and 10001 are general maintenance deliveries. SN Access System (SNAS) Release 10.1.1 contains fixes for three Discrepancy reports (DR). NCC Data System (NCCDS) 1002 contains a SpaceX Dragon data rate fix.

STS-132/133 MISSION OVERVIEWS

Mr. Aaron Frith provided an overview of upcoming Space Shuttle missions (refer to the presentation, *SSP Mission Overviews*). The remaining mission GC leads are Mr. Johnnie Brothers for STS-132; Mr. Aaron Frith for STS-133; and Mr. Luke Greer for STS-134. STS-132 is currently scheduled for launch on May 14, 2010. (Editor's Note: the launch occurred as scheduled.) This is the 34th ISS flight and the 32nd and last for Atlantis. This is the ISS Utilization Logistics Flight 4 (ULF-4). Three Extra Vehicular Activities (EVA) are planned. Mr. Frith provided diagrams of the Integrated Cargo Carrier-Vertical Light Deployable 2 (ICC-VLD2) payload and the Mini Research Module 1 (MRM1). An extra K-band antenna for ISS will be delivered on this mission. STS-133 is currently scheduled for launch on September 16, 2010. This is the 39th and final flight for Discovery. This mission will deliver the Permanent Multi-Purpose Module (PMM) and the ExPRESS Logistics Carrier 4 (ELC4) to ISS. No EVAs are planned. (Editor's Note: two EVAs have now been added.)

MILA/PDL STATUS

Mr. Ray Boatwright presented a MILA/PDL status (refer to the presentation, *MILA/PDL Status*). Mr. Boatwright stated that PDL had an unscheduled power outage. Repairs were being made that were supposed to last one day and be transparent to the network, but there was a problem. An incorrect configuration of one new breaker from the vendor created the problem. The problem has been corrected and there was no impact to STS-131 landing. The MILA/Bermuda Re-engineering (MBR) Site Status Message (SSM) and Remote Control Interface (RFI) Amazon routers were not replaced with the new Juniper routers. Testing showed two issues. The Juniper routers will be installed post STS-132. The Junipers routers will remain as backup for the Amazon routers. There have been no software changes since STS-131. There is no open work. There is one DR from STS-131 that was closed. Staffing is sufficient to meet all requirements, but there is a concern over attrition of site personnel. MILA has 5 new personnel on site. MILA is conducting operations training and working with GSFC to schedule additional simulations and exercises. Mr. Bangerter stated that he is trying to schedule the Shuttle Training Aircraft (STA).

WALLOPS STATUS

Mr. Mark Harris presented a Wallops status (refer to the presentation, *Wallops IIM Status*). Mr. Harris reported that there have been no hardware changes since the May 2009 NSG. The Enertec D200 downconverter was repaired in two phases. Monitor and Control software was upgraded in October 2009. A 3880 Antenna Control Unit (ACU) software change was made in October 2009 to protect the antenna by reducing velocity during non-essential antenna movements. Mr. Harris stated that Wallops is adding 5M antenna Monitor & Control (M&C) capability to the Alternate Station Control Computer (SCC). For STS-132, the PTP will be prime for command with failover to the PTP backup and the NCPS will not be on mission status.

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The NCPS will be removed post STS-132. There are no issues with the VHF or Ultra High Frequency (UHF) equipment. Two DRs remain open. The 11M ACU issue is with one of the new units. The vendor is investigating. The problem did not impact the mission. A spare is available and there is a workaround to reboot the unit daily. He will keep the network updated on the status of the 11M ACU. Open work includes the removal of the NCPS and shipping it to MILA, software changes associated with the removal of the NCPS, and changing the method of delivering the Symantec Virus software. Facilities are Green. Staffing is sufficient to meet requirements.

DFRC STATUS

Mr. Bob Guere provided a DFRC status (refer to the presentation, *DFRC Range Status*). Mr. Guere reviewed the DFRC support status; ATF-1 is prime, ATF-2 is backup, and ATF-3 is backup landing support only. The question was raised as to whether ATF-3 can be used as backup if there are problems with ATF-2 and Mr Guere stated that on-orbit support is difficult due to the smaller dish at ATF-3. Mr. Guere reviewed the NTR and video support. Work continues on ATF-2 to troubleshoot the uplink system failures. There is an open DR on the elevation motor fault at ATF-3. There have been no new faults. This DR should be closed prior to STS-132. The FRCC pedestal is being overhauled April 22 through May 4. Mr. Jerry Wolfe will work with Ms. Linda Hodges to schedule ISS passes. Mr. Bangerter stated that he has questions and issues about the overhaul. The network did not know about this activity. He stated that he would talk with Mr. Dave Jones about the notification process. The information was not in the Operational Readiness Review (ORR) and therefore not in the JSC Mission Operations Directorate (MOD) Flight Readiness Review (FRR) to be reported to the FDs and program. The Long Range Optics (LRO)-1 has intermittent focus and the suspect circuit has been moved to zoom. Communications facility Comm 3 reflector replacement is underway. Comm 1 and 2 will be configured as prime and backup. Estimated completion is mid June. DFRC would like to conduct Space to Space Station Radio (SSR) testing by mid June.

AFSCN STATUS

Lt. Victoria Gomez provided an AFSCN Status (refer to the presentation, *AFSCN Update*). Lt. Gomez reviewed the organization chart. Lt. Gomez reviewed the wing organization chart. Space Shuttle operations fall under the Space Development Test Wing (SDTW) at Kirtland Air Force Base (KAFB). There are five RTs that provide support; none are mandatory. Lt. Gomez reviewed two Shuttle support mission overview diagrams. Lt. Gomez reviewed past Space Shuttle missions supported (STS-114 through 119 and recent missions supported STS-125 through 131). During STS-131, the AFSCN had 42 contacts. OAS closes on August 31. There will be no AFSCN coverage for STS-133 and -134. There are no open DRs. LION-A had an operator error on the last mission and LION-B will be prime for STS-132. There is an ongoing communications upgrade and some alternate links will be down for some sites.

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NISN MISSION OPERATIONS STATUS

Mr. Chris Spinolo provided a NISN mission operations status (refer to the presentation, *NISN Mission Operations Status*). Mr. Spinolo reviewed the NISN mission and goals. NISN has the mission to provide cost-effective Wide Area Network (WAN) telecommunications services for transmission of data, video, and voice for all NASA Enterprises, Programs, and Centers, utilizing commercial capability wherever possible. Mr. Spinolo provided a high-level organization chart. Mr. Spinolo reviewed the current NISN staffing. The transition from AMC-6 to AMC-3 was successful and services are better. AMC-3 will be used for the next mission. AMC-3 Space Shuttle mission operations support services include the 50-Mbps Space Shuttle data, Mission Evaluation Room (MER), and Live Interview Media Outlet (LIMO) channels. The Small Conversion Device (SCD) refresh at DFRC is complete. These will be used the next mission. The reroute of the Secondary Label Switched Path (LSP) for the MILA prime and backup command interfaces is complete. This ensured diversity in the case of failure and supported the last mission. The Personal Computer Ground Operations Application Language (PC Goal) T-1 circuit between KSC and DFRC has been problematic. A NISN Service Request (NSR) was submitted to implement an End-to-End (ETE) 1.536 data service and STS-131 was successfully supported on this service. Mr. Spinolo reviewed NISN Major F10 mission initiatives which include digital matrix switch replacement, MOVE, mission Nortel router replacement, Tracking Data System (TDS) upgrade, and Networx transition. The TDS will be upgraded to Version 2.2B. The legacy software will be partitioned on all TDS hard drives. There are no operational changes. The Networx contract was awarded to AT&T in February 2010. AT&T is the incumbent for the mission segment. A major part of the change is in the paperwork and there is not a lot of impact to the customer. Mr. Aquino asked if the documentation needs to be changed and Mr. Spinolo stated that he does not think so. There are no new network deployments. The government will now own the equipment.

ISS ACTIVITIES

Mr. Lawrence Moore provided an overview of the upcoming ISS expeditions (refer to the presentation, *Expedition 23 – 24*). The ISS crew Expedition 23_24 will be nine with three Russians. Mr. Moore explained the Increment 23 patch design. Mr. Moore reviewed the Increment 23/24 significant events. He provided an MRM1 overview. This is a major edition during the increment. He stated that TD 275 has Single Access (SA)-1 limitations and SA1 usage has been negotiated. Mr. Bangerter stated that he and Mr. Aquino will be reviewing VV Super Critical periods. Mr. Marriott stated that the definitions need to come out of the VV Office and Mr. Bangerter replied that he is aware and will work this. ATV will launch in December and HTV in January. Both will have the same basic communications requirements. Ms. Liz Clark and Jackie Trahan and Messrs. Tom Russell, Erik Richards, and Tom Holmes accepted an action item to identify the frequency allocation and communications requirements for ATV and HTV and work a communications plan with the GCs for ATV2 docking and HTV2 grapple (dual docked operations) (action item 0510-NSG-01).

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MOVE

Mr. Dan Duffy provided a MOVE status (refer to the presentation, *Mission Operations Voice Enhancement*). Mr. Duffy provided a site status. MSFC is operational. GSFC, JSC, Jet Propulsion Laboratory (JPL), WSGT, STGT, Guam Remote Ground Terminal (GRGT), Goldstone, and Wallops are in transition. KSC is in the requirements planning phase. JPL is the first Voice over IP (VoIP) site. The MOVE team is still engaged in MOVE activity. Severity levels and FUSA response times have been defined for troubleshooting. There are four severity levels. Mr. Duffy reviewed the levels (Loss of Service, Degraded Service, Potential Service Impact, and Information). There are three open issues. Mr. Duffy stated that he is comfortable that FUSA has a handle on all the issues. A Common Object Request Broker Architecture (CORBA) error results in offline service Configurator application lockup. Resetting the server is the workaround until a patch is delivered. There is an up to 8-second drop during certain Line Replaceable Unit (LRU) failover scenarios. FUSA will be providing an interim fix in the next software delivery. A permanent fix is scheduled for July 2010. An audio trace fix was incorporated in a system release in June 2010. Mr. Duffy reviewed pictures of the keyset types and future keyset types. He stated that he believes that proposal for keyset type F will be approved.

NACAIT

Mr. Mike Fanders gave a NACAIT status (refer to the presentation, *NACAIT Status*). CSA four channel ISS video is now operational, but there is a freezing video issue being tracked. The Japan Aerospace Exploration Agency (JAXA) gateway upgrades are scheduled for Summer 2010. There are no Japanese Experiment Module (JEM) Operations Control System (OCS) operations issues. The European Space Agency (ESA) is working voice issues. The Columbus lab is in full operation. The Agenzia Spaziale Italiana (ASI) gateway is prime path for SWIFT command and telemetry. The last Multi-purpose Logistics Module (MPLM) is scheduled for launch. The Russian Space Agency (RSA) Houston Support Room (HSR) restructuring discussions are underway and the administrative services are being upgraded. Mr. Fanders provided a Commercial Orbital Transportation Services (COTS) VV status. There are no launch dates for SpaceX. A software fix is being implemented at WSC. The ISS Network PRD (NPRD) is being updated.

NSG ACTION ITEM WRAPUP

The following action item was assigned at the May 6, 2010, Main Forum of the NSG.

0510-NSG-01 Liz Clark/GSFC/HSF, Jackie Trahan/JSC/GC Office
Tom Russell/GSFC/HSF, Erik Richards/GSFC/HSF,
Tom Holmes/JSC/HTV2

ACTION: Identify the frequency allocation and communications requirements for ATV and HTV and work a communications plan with the GCs for ATV2 docking and HTV2 grapple (dual docked operations).

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CLOSING REMARKS

Mr. Bangerter thanked the attendees for their participation at the May 2010 NSG. The next NSG is tentatively scheduled for the September – October 2010 time frame.

Network Support Group Acronyms and Abbreviations

ACU	Antenna Control Unit
AFSCN	Air Force Satellite Control Network
AI	Action Item
ASI	Agenzia Spaziale Italiana
ATF	Aeronautical Tracking Facility
ATV	Automated Transfer Vehicle
BM	Briefing Message
BRAC	Base Closure and Realignment Commission
CCB	Configuration Control Board
CDR	Critical Design Review
CD&SC	Communications Data & Switching Center
CIG	Customer Interface Group
CORBA	Common Object Request Broker Architecture
COTS	Commercial Orbital Transportation Services
CSA	Canadian Space Agency
DARS	Dryden Apple Replacement System
DCN	Documentation Change Notice
DFRC	Dryden Flight Research Center
DR	Discrepancy Report
DVICE	Digital Voice Inter-Communications Equipment
ELC	ExPRESS Logistics Carrier
EMCC	Emergency Mission Control Center
ESA	European Space Agency
ET	External Tank
ETE	End-to-end
EVA	Extra Vehicular Activity
FD	Flight Director
FDF	Flight Dynamics Facility
FRR	Flight Readiness Review
FSCC	Fastcom Serial Communications Controller
FY	Fiscal Year
GC	Ground Controller
GDIS-R	Guam Data Interface System Replacement
GNC	Guidance, Navigation, and Controls
GRGT	Guam Remote Ground Terminal
GS	Ground Segment
GSFC	Goddard Space Flight Center

Network Support Group Acronyms and Abbreviations

HOSC	Huntsville Operations Support Center
HRDS	High Rate Data Switch
HSF	Human Spaceflight
HSFC	Human Spaceflight Comm
HSR	Houston Support Room
HTV	H-II Transfer Vehicle
ICC-VLD	Integrated Cargo Carrier-Vertical Light Deployable
ICD	Interface Control Documents
IDEA	ISS Downlink Enhancement Architecture
IIGOR	ISS IP Ground Routed Network
IN	Integrated Network
ISI	Interim Support Instruction
ISS	International Space Station
ISSP	ISS Program
JAXA	Japan Aerospace Exploration Agency
JDMTA	Jonathan Dickinson Missile Tracking Annex
JEM	Japanese Experiment Module
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
KAFB	Kirtland Air Force Base
KFRL	Kennedy Forward/Return Link
KSA	K-band Single Access
KSC	Kennedy Space Center
LIMO	Live Interview Media Outlet
LL	Lessons Learned
LRO	Long Range Optics
LRU	Line Replaceable Unit
LSP	Label Switched Path
MA	Multiple Access
MBR	MILA Bermuda Re-Engineering
M&C	Monitor & Control
MCC	Mission Control Center
MDM	Multiplexer/Demultiplexer
MDS	Multi-conference Digital Switch
MER	Mission Evaluation Room
MILA	Merritt Island Launch Annex
MOD	Mission Operations Directorate

Network Support Group Acronyms and Abbreviations

MOVE	Mission Operations Voice Enhancement
MPLM	Multi-purpose Logistics Module
MRM	Mini Research Module
MSFC	Marshall Space Flight Center
NACAIT	Network and Communications Analysis and Integration Team
NASA	National Aeronautics and Space Administration
NCCDS	NCC Data System
NCPS	Network Command Processing System
ND	Network Director
NIC	Network Integration Center
NIMO	Networks Integration Management Office
NISN	NASA Integrated Services Network
NOD	Network Operations Directive
NOSP	Network Operations Support Plan
NPRD	Network PRD
NRRP	Nortel Router Replacement Project
NSG	Network Support Group
NSR	NISN Service Request
OAS	Onizuka Air Station
OCS	Operations Control System
ODAR	Obsolescence-Driven Avionics Redesign
ORR	Operations Readiness Review
OSC	Orbital Sciences Corporation
PC Goal	
PDL	Ponce de Leon
PDR	Preliminary Design Review
PMM	Permanent Multi-Purpose Module
PMR	Post Mission Review
PRD	Program Requirements Document
PSS	Portable Spacecraft Simulator
PTP	Programmable Telemetry Processor
RAIL	Rolling Action Item List
RF	Radio Frequency
RFI	Remote Control Interface
RSA	Russian Space Agency
RTS	Remote Tracking Site; Reagan Test Site
SA	Single Access

Network Support Group Acronyms and Abbreviations

SCC	Station Control Computer
SCD	Small Conversion Device
SDTW	Space Development Test Wing
SGL	Space-to-Ground Link
SMM	Spacecraft Mission Manager
SMTF	Software Maintenance and Test Facility
SN	Space Network
SNAS	SN Access System
SRT	System Readiness Test
SSC	Subsystem Controller
SSM	Site Status Message
SSP	Space Shuttle Program
SSR	Space to Space Station Radio
STA	Shuttle Training Aircraft
STGT	Second TDRSS Ground Terminal
TDRS	Tracking and Data Relay Satellite
TDRSS	Tracking and Data Relay Satellite System
TDS	Tracking Data System
TNOSP	TDRSS NOSP
TOCC	TDRSS Operations Control Center
TOPO	Trajectory Operations Officer
TWTA	Traveling Wave Tube Amplifier
UHF	Ultra High Frequency
ULF	Utilization and Logistics Flight
VAFB	Vandenberg Air Force Base
VHF	Very High Frequency
VoIP	Voice over IP
VV	Visiting Vehicle
WAN	Wide Area Network
WFF	Wallops Flight Facility
WG	Working Group
WSC	White Sands Complex
WSGT	White Sands Ground Terminal
WSSH	White Sands Space Harbor