Human Spaceflight (HSF)
Network Support Group (NSG)
Meeting

October 8, 2009

Billows of smoke and steam rise above Launch Pad 39A at NASA's Kennedy Space Center in Florida alongside Space Shuttle Discovery as it races toward space on the STS-128 mission.

Rollout of Space Shuttle Discovery is slow-going due to the onset of lightning in the area of Launch Pad 39A at NASA's Kennedy Space Center in Florida.

Human Spaceflight (HSF)
Network Support Group (NSG)
Meeting

October 8, 2009

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

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

Network Support Group Contents

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Network Support Group Attendance

The attendees listed below attended all or part of the October 5 – October 8, 2009 NSG (splinter sessions and/or main forum).

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Network Support Group Minutes

INTRODUCTION

Mr. Jim Bangerter convened the October 8, 2009, Human Spaceflight (HSF) Network Support Group (NSG) meeting to discuss requirements, planning, and issues in support of the Space Shuttle and International Space Station (ISS). Mr. Bangerter welcomed the attendees and thanked them for their attendance at the NSG.

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*). The status was current as of October 2, 2009. The RAIL was tracking Action Items (AI) from 19 meetings. The Onizuka Air Station (OAS) to Vandenberg Air Force Base (VAFB) transition meetings are on hold pending a decision by the Space Shuttle Program (SSP) as to whether the program will continue to require the Remote Tracking Sites (RTS). Due to personnel changes at the Johnson Space Center (JSC), the Station Development Test Objective (SDTO) and Alternate State Vector Management (ASVM) meetings are on hold. There were 33 open AIs of which 21 were overdue. Mr. Bangerter asked that Mr. Testoff review the open AIs. As a result of the review, 5 AIs were closed. Mr. Testoff asked that the actionees provide responses by the close date. He stated that it had become difficult getting responses, thus the number of overdue AIs.

HSF DOCUMENTATION STATUS

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

A. Ms. Perrotto reviewed the documents published since the last NSG. These documents included the *Network Operations Procedure for Air-to-Ground Systems*, 450-NOP-001, Documentation Change Notice (DCN) 001; *Shuttle Antenna Monitoring System (SAMS) Users Guide*, 450-UG-HSF/SAMS, Original; and the *Tracking and Data Relay Satellite System Network Operations Support Plan (TNOSP) for the Space Shuttle*, 450-TNOSP-Space Shuttle, DCN 004.

B. Ms. Perrotto reviewed the documents in Configuration Control Board (CCB) review. The documents include the *Network Operations Directive for Human Space Flight Network Support*, 450-NOD-HS, Revision 3; *Tracking and Data Relay Satellite System Network Operations Support Plan (TNOSP) for the International Space Station ISS)*, 450-TNOSP-ISS (rewrite and renumber); and the *Tracking and Data Relay Satellite System Network Operations Support Plan (TNOSP) for the International Space Station ISS) H-II Transfer Vehicle (HTV) Annex*, 450-TNOSP-ISS, HTV Annex, Original. Mr. Gary Morse asked the status of the NOD, as it had gone to CCB and the CCB had been cancelled. Mr. Testoff stated that he would provide an update during his CCB issue walk-on presentation.

C. Ms. Perrotto reviewed the documents in general review (six). She noted that the *Human Spaceflight Program Emergency Mission Control Center Activation and Operations Procedures*, 450-CAP-EMCC, Revision 3 has the Kennedy Forward/Return Link (KFRL) updates included. The *Network Operations Support Plan for the Space Shuttle Program, 450-NOSP-Space Shuttle*, Revision 1, DCN 003 updates the Wallops section to

include additional details on the 11M system. Mr. Mark Harris added that Wallops will have potential Network Command Processing System (NCPS) updates to provide.

D. Ms. Perrotto reviewed the documents in local review at the Goddard Space Flight Center (GSFC) (two).
E. Ms. Perrotto reviewed the plans for updates during the next Fiscal Year (FY).

HSF CCB ISSUES

Mr. Steven Testoff, as a walk on, gave a presentation on the HSF CCB issue (refer to the presentation, *Human Spaceflight Documentation CCB Issue*). Mr. Testoff stated that during the December 2007 to September 2009 time period, there were a number of documents sent for CCB review, and due to a lack of response by the reviewers the CCBs were cancelled. In some cases, there were multiple rescheduling and cancellations. He presented a chart that illustrated the documents sent to CCB and then pulled. The HSF CCB process has several steps. The documents are first sent to General Review (prior to CCB) at which time the Integrated Network (IN) elements are expected to provide their technical input. The inputs are collected and incorporated into the documents. The documents are then sent for CCB review at which time the elements are expected to provide Concurrence. Concurrence indicates that the elements agree with the contents of the document and that their inputs have been included correctly. The CCB is not a second General Review. The Networks Integration Management Office (NIMO) Chief, Mr. Scott Greatorex, the HSF CCB Chair, has instructed that if more than a set number of technical inputs are received, the document will be pulled from CCB. This is what happened to the NOD. During the course of the CCB review process, approximately 60 inputs were received. The document was pulled from CCB. He has also instructed that if the elements have not indicated their concurrence via email, the document will be pulled from CCB. Each time the documents are sent, reminders are sent that the CCB is approaching. Mr. Bangerter stated that it seems that document review is taking a back seat to other duties. It is critical that the documents be kept up to date or the network runs the risk of committing errors. Mr. Bob Marriott stated that JSC has created a central point-of-Contact (POC) for document review. Mr. Bangerter reiterated the need to review the documents in a timely manner.

NSG SPLINTER SESSION SUMMARIES

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

A. Automated Transfer Vehicle (ATV)-2 Status. Mr. Tom Franklin provided a summary (refer to the presentation, *Automated Transfer Vehicle (ATV) 2 Operational Review*). Launch is scheduled for November 30, 2010, from the French Guyana launch site at Kourou on an Ariane 5 launch vehicle. ATV docking is planned for December 19, 2010. Undocking is currently scheduled for May 2011. Space Network (SN) initial acquisition is four minutes prior to Ariane 5 separation. No action items were assigned.
B. Voice Loop Protocol. Ms. Melissa Blizzard provided a summary (refer to the presentation, *Voice Loop Protocol Splinter Agenda*). The meeting was held due an issue on STS-125. Weather reporting was one issue and the JSC weather office will be getting involved to help track weather. Discussions were held on staffing critical support

periods. All items will be discussed with the Ground Network (GN) at the upcoming Merritt Island Launch Annex (MILA) meetings. The TNOSP was not discussed at this time.

C. Dryden Flight Research Center (DFRC)/Wallops NCPS Replacement Status. Mr. John Kim provided a summary of the DFRC NCPS replacement discussion (refer to the presentation, *Dryden NCPS Replacement Summary*). Software modules (with 1/3 rate Shuttle Decoder) are completed. Replacement of the Dryden NCPS and the Dryden Apple Replacement System (DARS) upgrade are on schedule. A plan to get to the Critical Design Review (CDR) was outlined. Four AIs were assigned. Mr. Harris provided a summary of the Wallops discussion (refer to the presentation, *Wallops NCPS Replacement Splinter Summary*). Wallops is replacing the obsolete Wallops NCPS system with an Avtec "1/3 Rate" capable Programmable Telemetry Processor (PTP). The PTP desktops are built but not finalized. Wallops has verified data & clock into and out of the PTP. Wallops is capable of switching between the NCPS and the command PTP in approximately 1 minute or less. Portable Spacecraft Simulator (PSS) testing is scheduled for week of 01/11/10. On orbit verification/certification will be performed.

D. HSF Comm (HSFC) Working Group (WG). Ms. Angela Culley provided a summary (refer to the presentation, *Human Spaceflight Comm Working Group*). Ms. Culley stated that the purpose of the meeting was to review current and future NASA Integrated Services Network (NISN) requirements support HSF. Ms. Culley provided a status of NISN Service Requests (NSR), earth station manning, and the HSF equipment feasibility study. Mr. Chris Spinolo provided a review of the Internet Protocol Operations Network (IONet) classifications. There are three NSRs open for ISS IP Ground Routed Network (IIGOR) network. A cost estimated has been provided for the earth station manning. The cost would be a regular 8-hour shift if notice is provided 5 days in advance. If notice is received 48 hours in advance, then there would be overtime. NISN is working on how launch slips would be charged. Ms. Cully reviewed the action items that she received from other splinter sessions.

E. Mission Router Replacement. Mr. Scott Douglas provided a summary (no presentation was provided). The Closed IONet routers need to be replaced due to obsolescence. A high-level timeline for the project was provided at the splinter session. The project is a NASA Headquarters project and will be a 7120 process implementation. The Project Management Plan (PMP) is being worked. Funding will be available in FY 11. The Juniper routers are no longer supported after June 2012. Contingency planning is being done for the SSP should the program be extended.

F. SN Access System (SNAS) Status. Mr. Dave Warren provided a summary (no presentation was provided). Mr. Warren stated that a development and transition update was provided at the splinter session. Release 2 has transitioned to the White Sands Complex (WSC). The project is looking for the user community to use SNAS for scheduling full time. Code 452 is looking to help the user community move off the legacy scheduling systems by March of next year. Release 3 is due for delivery in January 2010. Release 3 will contain the final JSC requests and address critical Internal

Discrepancy Reports (IDR) from Release 2. Release 3 testing is scheduled for November 2009. An action item was assigned to review Constellation requirements.

G. Kennedy Forward/Return Link (KFRL) Status. Mr .John Steffes provided a summary (no presentation was provided). The purpose of the splinter session was to explain the remaining elements of KFRL. KFRL will replace the legacy circuits to the Record and Playback System (RPS). All circuits will be kept isolated from JSC. There will be no impact to JSC processes. It will be necessary to identify the Emergency Mission Control Center (EMCC) processes in the timeline. Kennedy Space Center (KSC) has provisional approval to use the remaining elements of KFRL. Mr. Steffes will be presenting to the JSC Ascent/Entry Flight Techniques Panel (A/EFTP).

H. Very High Frequency (VHF) Status. Mr. Kevin Riley provided a summary (refer to the presentation, *ISS/Soyuz VHF Support Team VHF Splinter Group Summary*). The purpose of the meeting was to provide a VHF network status. Mr. Riley reviewed the agenda from the splinter session. Mr. Riley reviewed highlights from the splinter session. VHF-1 emergency communications supports are good at all stations. VHF-2 proposed testing is needed due to the aging antenna components and criticality of the system. NASA is requesting permission to conduct routine verification of system integrity. U.S. Airways has agreed to support the program, but wants to review the test plan. The International Space Station Program (ISSP) is ready to support. During the first contact of the testing, the stations will be requested to take system performance measurements. Mr. Riley noted that the Soyuz 21 launch has slipped to December 21.

I. Reagan Test Site (RTS)/OAS to VAFB Transition. Mr. Bangerter provided a summary (no presentation was provided). The RTS discussion and OAS to VAFB transition splinter sessions were combined.
   1. The DoD is going through a new accreditation process and this affects the Kwajalein radar site. Several options were discussed for support from Kwajalein and one would involve a 30 – 60 minute delay in delivery of the data. JSC is conducting an analysis of the impact of the delay. Visiting Vehicle (VV) support is being reviewed. The question was raised as to whether the new accreditation process will affect other radar sites. Four AIs were assigned.
   2. OAS will be closing and operations will move to VAFB. There is a cost to the program to re-establish communications at VAFB. The OAS closure date is close to the Space Shuttle End-of-Mission (EOM) date. The question has been posed to the SSP whether the program wants to continue support from VAFB. Transition work is on hold pending a decision from the SSP. Mr. Douglas asked if Constellation has any requirements for the RTSs. Mr. Aquino replied that the Constellation program has stated that it does not.

J. Commercial Orbital Transportation Services (COTS) Status. Mr. Dennis Mateik provided a summary of the two COTS splinter sessions (refer to the presentation, *Commercial Orbital Transportation Services Splinter Summary*). Two meetings were held (SpaceX and OSC). The meetings were closed meetings and attendance was limited. Overviews of the COTS missions were provided. A review of network support requirements was provided. Communications links diagrams were reviewed. There were

technical discussions pertaining to scheduling and network configurations. Several AIs were assigned and POCs requested/provided.

K. Mission Operations Voice Enhancement (MOVE). Ms. Michele Mascari provided a summary (refer to the presentation, *MOVE Splinter Group Summary*). The purpose of the meeting was to describe MOVE-GSFC features new to GSFC and MOVE-GSFC transition and approach. GSFC currently has two old switches that need to be replaced. Some features of MOVE are new to GSFC, but not to other sites. These features are being discussed at GSFC, but may not be implemented. The MOVE-GSFC-1 Operations Readiness Review (ORR) is scheduled for October 29, 2009. GSFC transition is scheduled to begin November 30, 2009. The schedule is flexible to support mission operations. One AI was assigned.

L. Space Shuttle Mission Planning. Mr. Fred Pifer provided a summary (refer to the presentation, *STS-129/130/131 Mission Planning Splinter Meeting Summary Integrated Networks Plans*). The purpose of the meeting was to review the type and level of support for the upcoming Space Shuttle missions. Nominal support will include Air Force Satellite Control Network (AFSCN) operations from Kirtland Air Force Base (KAFB). There was a discussion regarding a minor call up issue with Diego Garcia (DGS); the site was not available. DGS will be available on a best-effort basis. An SN Ver/Val or Operational Readiness Test (ORT) will be conducted with the Electronic Systems Test Laboratory (ESTL). Virtual Spacecraft support was tested on STS-128. The configuration is not used that often at this time, but additional testing is scheduled for the upcoming mission. There will be changes to TD7 support and conflict resolution. A proposal was presented by Mr. Jon Walker and the decision was made to delay its implementation until after STS-129. STS-128 Space Shuttle Main Engine (SSME) issues are now resolved. There is the possibility of External Tank (ET) TV causing interference and this is under investigation. ET TV support will be under scrutiny during the next mission. One AI was assigned.

M. Constellation Tracking Data Formats and JSC – GSFC Interfaces. Mr. Mike Moreau provided a summary (refer to the presentation, *Cx Tracking Data Flows and Support Requirements*). The purpose of the meeting was to review tracking data flows related to Range Safety telemetry C-band tracking and low-speed data, review Cx plans for documenting support requirements that all outside Space Communications and Navigation (SCaN), provide a proposal for documenting support requirements for GSFC Flight Dynamics Facility (FDF), and discuss the future of legacy interface documents such as the JSC-11534. The Cx Preliminary Design Review (PDR) is coming up and the meeting was held to close issues and develop a forward plan. Tracking data flows to the Easter Range (ER) were discussed. Assumptions about the data flows may not be documented in the Program Requirements Document (PRD). Ops concepts need to be converted to requirements so that is no uncertainty. The ER will strip the data. Security requirements on NISN need to be worked. Mission operations wants to avoid serial data and the impact to the interfaces needs to be understood. C-band requirements were discussed. Mission operations wants to receive all C-band tracking not just the two best sources. Again, mission operations wants to eliminate serial data. Western Range (WR)

assets require the ER for routing data. There is a cost impact. Some assets today are paid for by the SSP. Where the funding for those assets come from in the future? Requirements documentation was discussed. There are currently three PSRDs in work for Cx. DoD requirements are in the PSRD. Some requirements are documented in the Program Introduction Document (PID). There is some uncertainty as to how these PSRDs will translate into actual requirements on the supporting elements. Mr. Mike Gawel stated that the ER is working with Cx on requirements and will provide costs when the requirements are known. NISN and FDF requirements were discussed. The JSC-11534 is being reviewed to determine which volumes are obsolete, which need to be updated, and if a new volume is needed. Several AIs were assigned. Mr. Moreau stated that the session was very productive and the organizations well represented.

N. H-II Transfer Vehicle (HTV) Post Mission Review (PMR) and Lessons Learned. Ms. Liz Clark provided a summary (refer to the presentation, *HTV-1 Post Mission Review and Lessons Learned*). The purpose of the meeting was to review network support for HTV-1, Lessons Learned, and the re-entry plan. Support from the SN, GSFC/FDF, NISN, Network Integration Center (NIC), and ER/radars during the HTV-1 mission was discussed. No problems were reported. SN Discrepancy Reports (DR) were reviewed. Tracking and Data Satellite (TDRS) usage during the mission was discussed. Lessons Learned were discussed: need to verify the setup in the WSC database, JSC/HTV Ground Configuration Message Request (GCMR) testing with GSFC/Radio Frequency (RF) Simulations Operations Center (SOC) (RFSOC) and WSC was a good test to conduct, and there was excellent coordination between the Japan Aerospace Exploration Agency (JAXA)/JSC to GSFC and WSC. One AI was assigned.

SN STATUS

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

A. Mr. Chavez reviewed the current TDRS configuration (satellite locations). TD7 is now the Zone of Exclusion (ZOE) spacecraft. Work is underway to replenish the fleet.

B. Mr. Chavez provided a fleet status.TD1 will be retired October 22. F3 will be activated on approximately October 29 and will be available for all users. The TD3 S-band Single Access (SSA)1 forward helix current variation issue is still being monitored. The TD3 Space-to-Ground Link (SGL) dedicated downlink Traveling Wave Tube Amplifier (TWTA) helix current problem has led to turning off the TWTA which will be reactivated at a later date. TD4 K-band Single Access (KSA)-2 forward power is below specification. A spare is available. TD4 is experiencing telemetry errors. A spare TWTA is available. TD4 is experiencing intermittent Multiple Access (MA) element problems. There has been no loss of data. TD4 has experienced power degradation. Battery 1 has failed and battery 2 has at least one degraded cell. The spacecraft was unable to support the entire user service payload during the longer eclipse season and likely will not be able to during the next eclipse season. Mr. Bangerter stated that TD3 at 49 degrees is available for customer support. Mr. Jon Walker stated that the designation

is 049 and a Network Advisory Message (NAM) will go out for testing. The STS-129 forecast will not be changed.

C. Mr. Chavez provided a WSC hardware status. The VAX 6000 equipment is obsolete and is being replaced. The software is being rehosted to Alpha DS25 series hardware. The final Alpha transition is complete. The current high-rate data switch is being replaced due to obsolescence and noon-maintainability. The current switch is a 64x64 and the new switch is 128x128 (the new switch will remain limited to 64x64 until the software is transitioned). The Second TDRSS Ground Terminal (STGT) and White Sands Ground Terminal (WSGT) will have the 128x128 capability and the Guam Remote Ground terminal (GRGT) will have 64x64 capability. The Guam Data Interface System Replacement (GDIS-R) will provide additional capacity and features. The TDRSS Operations Control Center (TOCC) is being upgraded. The antenna Subsystem Controllers (SSC) are being replaced. New units are being tested in the Software Maintenance and Test Facility (SMTF). The Integrated Receiver Sustainment (IRS) will upgrade modems and modernize receivers.

D. Mr. Chavez provided a WSC software status. SW deliveries 08012, 08013, 09002, and 09004 are general maintenance deliveries. SW delivery 09001 will deliver the software that allows the scheduling of the 64 additional ports. This delivery is scheduled 8 days prior to the current launch date. A back-out plan is in place.

E. Mr. Chavez provided a TDRS Designators overview. There is a known problem with the current naming convention. Users have requested a change. Changing the naming convention would require a software change and changes to the Interface Control Documents (ICD). Changes to user software will be required as well. It is possible to change the NCC Data System (NCCDS), but it will not be easy for some users to change their software. Mr. Jon Walker stated that HTSI has been tasked to survey the user community to determine what effort will be required to make a change. There have been several naming options suggested.

SPACE SHUTTLE MISSION OVERVIEWS

Mr. Bob Culbertson provided an overview of upcoming Space Shuttle missions (refer to the presentation, *SSP Mission Overviews*). There are six remaining missions on the current Space Shuttle manifest. Mr. Culbertson provided the names of the lead Ground Controllers (GC) for each mission as well as the ascent/entry and Orbits 1, 2, and 3 GCs. He provided the names of the crew members for each mission. He provided diagrams of the payload configuration for each mission and the payloads. STS-129/Utilization and Logistics Flight (ULF)-3 is currently scheduled to launch November 12, 2009. (Editor' note: the launch date has slipped.) The primary objective is the delivery of the ULF-3 Launch Package (LP), supplies, crew rotation equipment and ISS Utilization Middeck payloads. Three Extra Vehicular Activities (EVA) are planned. STS-130/20A is currently scheduled to launch February 4, 2010. The primary objective is the delivery of the final connecting node to the ISS (Node 3) and the Cupola. Three EVAs are planned. STS-131/19A is currently scheduled to launch March 18, 2010. The primary objective is the delivery of the Multi-Purpose Logistics Module (MPLM) and Lightweight Multi-Purpose Experiment Support Structure Carrier (LMC). Three EVAs are planned.

Network Support Group Minutes

ISS ACTIVITIES

Mr. Bob Culbertson provided an overview of the upcoming ISS expeditions (refer to the presentation, *Expedition 21 – 22*). Mr. Culbertson provided an ISS expedition mission overview. The crews will be setting up and activating new research facilities. They will also activate the new Combined Operational Load-Bearing External Resistance Treadmill (COLBERT); unberth the HTV; and welcome a new Russian docking module, two Space Shuttle crews, and a Progress resupply ship. Mr. Culbertson reviewed the crew exchanges. Mr. Culbertson provided an overview of the Increment patches. The central element of the Increment 21 patch is inspired by a fractal of six, symbolizing the teamwork of the six person crew. The Increment 22 patch illustrates that the 22nd Expedition to the ISS is dedicated to the final stages of assembly and the transition to full utilization as an orbiting laboratory. Mr. Culbertson reviewed Increment 21/22 significant activities. He noted that the dates for these activities are changing. Mini Research Module (MRM)-2 will be launched on November 10, 2009 and will dock on November 12, 2009. The MRM will be launched on an unmanned Soyuz. The COTS Dragon demonstration flight is scheduled for March 2010.

MILA/PDL STATUS

Mr. Ray Boatwright presented a MILA/Ponce deLeon (PDL) status (refer to the presentation, *MILA/PDL Status*). MILA major Preventative Maintenance (PM) on the 9M-1 and 9M-2 are complete. MILA Bermuda Re-Engineering (MBR) Amazon routers were replaced with new Juniper routers. A Precision Audio Distribution System (PADS), as backup to the Digital Voice Communications System (DVCS), is scheduled to be installed by Terminal Countdown Demonstration Test (TCDT). MBR router software was upgraded to accommodate installation of the new routers. The PDL Antenna Control Unit (ACU) software update is scheduled to be complete October 15 to clean up minor discrepancies. There is no open work. Mr. Boatwright reviewed the MILA DRs. Three of four are closed. The SSME DR remains under investigation. There are two distinct issues. The PDL demultiplexer timing problem has been resolved; timing was set to external. The MILA SSME problem due to possible ET TV interference is under investigation.

WALLOPS STATUS

Mr. Mark Harris presented a Wallops status (refer to the presentation, *Wallops 11M Status*). Mr. Harris reported that there have no hardware changes since the May NSG. Dynamic Link Library (DLL), slaving computer, and ACU software upgrades were completed. An Enertec firmware upgrade is being accomplished in two phases. Half the units were shipped to the factory to allow for orbital operations. The station configuration has not changed since the last NSG. There are no current equipment issues. VHF-1 ISS tracks were supported without problem. Eleven VHF-2 Soyuz 19 tracks were supported in May without problem. There are two open DRs. Operational workarounds are in place. NCPS to PTP work is ongoing. The server antivirus software is due to be changed; the date is to be determined. Mr. Bankert stated that he would provide an anti-virus software upgrade date to Mr. Harris. Facilities are Green.

Staffing is sufficient to meet all requirements. PSS testing of the PTP commanding upgrade is planned for January 2010.

DFRC STATUS

Mr. Tracy Ackeret provided a DFRC status (refer to the presentation, *DFRC Range Status*). Mr. Ackeret is the operations lead for the Space Shuttle. Aeronautical Tracking Facility (ATF) support configuration is standard. ATF-1 will be prime; ATF-2 backup. The communications configuration will be standard. Transponder 5 will be configured through-put for mission support. There is a 2-hour response time for technical support. The NCPS and DARS are being replaced by PTPs. This is scheduled to be complete by the end of Calendar Year (CY) 2009. ATF-2 installation will be first while ATF-1 remains the same (to be done at a later date). It would take approximately 2 hours to go back to the previous configuration. Remote DARS and Small Conversion Device (SCD) monitoring capability is in work. Mr. Aquino asked if the Transponder 5 encoding capability has been tested. Mr. Ackeret asked that Mr. Aquino send an email and he will set up a test of the Transponder 5 encoders. The comm 3 reflector dish replacement is ongoing. A firm date for completion is needed.

AFSCN STATUS

Lt. Ryne Roady provided an AFSCN Status (no presentation was provided). The OAS transition is open work. The LION-A outage was due to an Operator Error (OE). The procedure is being updated. All sites will be briefed. The support agreement for unplanned contacts has been updated. The agreement now stated that it will be 'best effort'. If there is an emergency, staffing will be 24x7. Mr. Bangerter stated that when called, personnel can be out to the site in 3 – 4 hours.

NISN MISSION OPERATIONS STATUS

Mr. Scott Douglas provided a NISN mission operations status (refer to the presentation, *NISN Mission Operations Status*).

A. The MOVE GSFC Skills Catalog training is now complete. GSFC MOVE work is dependent on the launch schedule. Mr. Mike Marsh asked if GSFC will be prime on MOVE for STS-130. Mr. Douglas stated that that is the goal. Mr. Marsh stated that he has noticed that voice services with GSFC have degraded over the past missions. It is often necessary to ask that conversations be repeated. Mr. Bangerter stated that he has noticed issues with the entire communications system. Mr. Greatorex stated that it was almost necessary to scrub to the Sealaunch launch. Mr. Marriott asked if these problems have been documented. Mr. Bangerter stated that the issues have been documented. Mr. Bangerter stated that it has not affected Space Shuttle operations, but is problematic. Mr. Douglas stated that the COMMGR should be notified when there are problems and the sound levels can be checked. Mr. Bangerter stated that the COMMGR is notified.
B. DFRC SCDs are being upgraded from Pentium 1 to Pentium 4 devices to comply with JSC request to keep the time drift in the 4800-bit block time filed to 25 ms or less and due to sparing issues with the Pentium 1s. Mr. Marriott asked if the clock drift is a problem at DFRC only or generic to all SCDs. Mr. Douglas replied that it is generic to

all PCs. Mr. Marriott asked if the other SCDs are being evaluated. Mr. Douglas stated that NISN has not seen a trend and the SCDs are periodically resync'd. The SSP requirement is more stringent and most SCDs resync daily. Mr. Bangerter asked if there is an overall timing issue. Mr. Douglas replied that DFRC is the only site with the tight requirement. A fix would require Inter-range Instrumentation Group (IRIG) timing standard and that would require software development. This would be too costly considering the time remaining in the SSP. KFRL is serial clock and data. The SCDs have been put on external timing. Mr. Marsh stated that there have problems at DFRC not seen at MILA and Wallops. Mr. Doug Solomon stated that blocking is not occurring at MILA or Wallops. Mr. Robert Jones stated that data will be blocked at DFRC and that DARS has an IRIG timing source.

C. The DCE to DTE timing change is complete. Ms. Blizzard stated that the network has begun testing.
D. E&M keying change has been installed and tested.
E. White Sands Space Harbor (WSSH) RAD training is scheduled for the week of October 26. Joint operations are planned for STS-129. The RAD will be turned over to WSC for STS-130. Mr. Bangerter stated that the documentation needs to be updated (e.g., Local Operating Procedures [LOP] at WSC).
F. Mr. Douglas discussed the firewall request process. The Front End Processor Replacement (FEPR) has a NISN-managed firewall. Mr. Douglas provided the current process for requesting changes. Work is underway to simplify the process (there are different request systems). The goal is to migrate to the NASA Account Management System (NAMS). The person on the more secure network has to make the change request for the less secure network. It takes 5 business days to implement after the request has been approved; approval takes a couple of days. All rules have an expiration date. Mr. Marriott asked if there are reminders for approaching expirations. Mr. Douglas stated that an email is sent. NISN encourages using accounts based on position and not the names of individuals. NISN needs to be notified when there are changes to the individuals.

CONSTELLATION UPDATE

Mr. Vern Hall provided a Constellation update (refer to the presentation, *Constellation*). Mr. Hall reviewed the program of record: complete the International Space Station; safely fly the Space Shuttle until 2010; develop and fly the Crew Exploration Vehicle (Orion) no later than 2014; return to the Moon no later than 2020; extend human presence across the solar system and beyond; implement a sustained and affordable human and robotic program; develop supporting innovative technologies, knowledge, and infrastructures; and promote international and commercial participation in exploration. The Mars and Beyond goal is still active and being worked. Mr. Hall reviewed the Constellation organization. The organization relies heavily on the JSC Mission Operations Directorate (MOD). Constellation leverages unique skills and capabilities throughout NASA. Mr. Hall reviewed a high-level schedule. The PDR is scheduled for July 2010. Seven options for HSF have been presented to the White House and a decision is

awaited. Letters have been sent by the Science Advisor to Congress requesting that agency funding be restored to meet Constellation needs.

ARES-1X FLIGHT FOLLOW ON

Mr. Bob Marriott gave an Ares-1X flight follow on (refer to the presentation, *Ares1-X Flight Following Preparation Status*). Mr. Marriott presented a diagram of the Ares 1-X Flight Test Vehicle (FTV); the first stage uses a Space Shuttle Solid Rocket Motor (SRM). Mr. Marriott reviewed the development responsibilities of the various NASA centers. An Ares 1-X flight test overview diagram was presented. Test flight objectives include demonstrating controllability, characterizing integrated vehicle roll torque, performing in-flight separation/staging, demonstrating first stage entry dynamics, and demonstrating assembly and recovery of an Ares 1 similar first stage. JSC will provide flight following support. JSC has no active role in launch or operations. JSC will see the telemetry remotely. The tracking data interface is a standard Space Shuttle launch interface. Requirements are documented in the PRD. There will be video cameras onboard and on the pad. The Mission Evaluation Room (MER) can select video channels. Live Interview Media Outlet (LIMO) approval is in work. Mr. Marriott provided a list of the voice loops. Mr. Marriott provided a list of checkout and support activities. JSC has no funds for checkout activity. Mr. Marsh stated that JSC is trying to piggyback support on an ER test; JSC is prepared to support if possible. Mr .Marriott stated that JSC participation would be valuable to characterize any subtle differences in support from Space Shuttle. Mr .Aquino stated a concern that too many persons (JSC and Marshall Space flight Center [MSFC]) would be signed onto IRIS for the launch and the server might crash. Messrs. Marriot and Blum believe that due to client and password limitations and other monitoring processes in place, that this will not be an issue.

MOVE

Mr. Dan Duffy provided a MOVE status (refer to the presentation, *Mission Operations Voice Enhancement*). Mr. Duffy described the three levels of vendor testing (First Article [FA], Factory Acceptance Tests [FAT], and Site Acceptance Tests [SAT]). FA testing is 6 six weeks of testing on a maxed out system. FAT are configured at the vendor location and build for the site (e.g., GSFC). Site personnel test a set of requirements and ensure that the switch configuration is correct for that site. For SAT, the vendor installs the system (except keysets) at the site and runs the test to ensure that the system has been delivered in sound condition. SATs are complete at four sites. Mr. Duffy reviewed the sites under contract that have testing in progress or scheduled. Options remain for KSC and MILA and DFRC is not expected to exercise an option. A mini-MOVE system has been installed at KSC. The contract start date is March 2010. MILA's option is TBD. Mr. Duffy reviewed the site and MOVE Agency Project Management Team responsibilities after SAT.

NACAIT

Mr. Mike Fanders gave a Network and Communications Analysis and Integration Team (NACAIT) status (refer to the presentation, *NACAIT Status*). Mr. Fanders reviewed the status of the International Partner gateways. There are no issues for the Canadian Space Agency (CSA).

There are no issues with JAXA Japanese Experiment Module (JEM) (Kibo) operations. The voice via Inter orbit Communications System (ICS) Ka-band antenna has not been tested. JAXA HTV operations have gone smoothly; there are no issues. Second generation transponder testing is scheduled for no earlier than February 2010. The transponder is backup for HTV2 and prime for HTV3. The European Space Agency (ESA) is working voice issues. End-to-End (ETE) testing of the new ATV Control Center (ATV-CC) begins no earlier than March 2010. The Agenzia Spaziale Italiana (ASI) gateway continues support to ASI payloads and ISS. The ASI gateway will be the prime command and telemetry path for SWIFT. The Russian Space Agency (RSA) gateway has transitioned to Total Internet Protocol (IP) convergence, eliminating the Asynchronous Transfer Mode (ATM) structure. The COTS Dragon Demonstration launch is no earlier than January 2010. The OSC Cygnus launch is no earlier than March 2011. The ISS Backup Control Center (BCC) is operational. If MCC-H is going to be down, then the entire team travels to the MSFC Huntsville Operations Support Center (HOSC). Mr. Fanders reviewed the Constellation requirements documentation. It is JSCs goal not to change the way Space Shuttle and ISS requirements are now processed. Mr. Aquino stated that the PSRD is the Pre-PRD for the Exploration Systems Mission Directorate (ESMD) phase. PSRDs are in the CRADLE system.

ISS FEPR CLOSEOUT

Dr. Norman Kluksdahl gave an ISS FEPR closure status (refer to the presentation, *ISS FEPR Final Status Report to NSG*). FEPR stepped up to operations in July 2008. It has been operating continuously for 15 months. There are no major problems. There is a minor decrease in telemetry latency (100 ms). FEPR is supporting the BCC and HOSC. TRM is an interim TCP connection from JSC to the NCCDS that will be used until SNAS has all required real-time status and control functionality. All TRM issues have been resolved. TRM stepped up to operations in August 2009. In summary, FEPR is complete and thanks to the many people who worked so hard to make the project happen.

NSG ACTION ITEM WRAPUP

No action items were assigned at the October 8, 2009, Main Forum of the NSG.

CLOSING REMARKS

Mr. Bangerter thanked the attendees for their participation at the October 2009 NSG. The next NSG is tentatively scheduled for the mid-April 2010 time frame. Mr. Bangerter handed out JSC award to Ms. Jewel Hervey and Mr. Joe Aquino.

Network Support Group Acronyms and Abbreviations

ACU	Antenna Control Unit
A/EFTP	Ascent/Entry Flight Techniques Panel
AFSCN	Air Force Satellite Control Network
AI	Action Item
ASI	Agenzia Spaziale Italiana
ASVM	Alternate State Vector Management
ATF	Aeronautical Tracking Facility
ATM	Asynchronous Transfer Mode
ATV	Automated Transfer Vehicle
BCC	Backup Control Center
CCB	Configuration Control Board
CDR	Critical Design Review
COLBERT	Combined Operational Load-Bearing External Resistance Treadmill
COTS	Commercial Orbital Transportation Services
CSA	Canadian Space Agency
CY	Calendar Year
DARS	Dryden Apple Replacement System
DCN	Documentation Change Notice
DFRC	Dryden Flight Research Center
DGS	Diego Garcia tracking site
DLL	Dynamic Link Library
DR	Discrepancy Report
DVCS	Digital Voice Communications System
EMCC	Emergency Mission Control Center
EOM	End-of-Mission
ER	Eastern Range
ESA	European Space Agency
ESMD	Exploration Systems Mission Directorate
ESTL	Electronic Systems Test Laboratory
ET	External Tank
ETE	End-to-end
EVA	Extra Vehicular Activity
FA	First Article
FAT	Factory Acceptance Testing
FDF	Flight Dynamics Facility
FEP	Front End Processor
FEPR	FEP Replacement

Network Support Group Acronyms and Abbreviations

FTV	Flight Test Vehicle
FY	Fiscal Year
GC	Ground Controller
GCMR	Ground Configuration Message Request
GDIS	Guam Data Interface System
GN	Ground Network
GRGT	Guam Remote Ground Terminal
GSFC	Goddard Space Flight Center
HOSC	Huntsville Operations Support Center
HSF	Human Spaceflight
HTV	H-II Transfer Vehicle
ICD	Interface Control Documents
ICS	Inter Orbit Communications System
IDR	Internal Discrepancy Report
IIGOR	ISS IP Ground Routed Network
IN	Integrated Network
IONet	Internet Protocol Operations Network
IP	Internet Protocol
IRIG	Inter-range Instrumentation Group
IRS	Integrated Receiver Sustainment
ISS	International Space Station
ISSP	ISS Program
JAXA	Japan Aerospace Exploration Agency
JEM	Japanese Experiment Module
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
LOP	Local Operating Procedures
LP	Launch Package
LMC	Lightweight Multi-Purpose Experiment Support Structure Carrier
MA	Multiple Access
MBR	MILA Bermuda Re-Engineering

Network Support Group Acronyms and Abbreviations

MCC	Mission Control Center
MER	Mission Evaluation Room
MILA	Merritt Island Launch Annex
MOD	Mission Operations Directorate
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
NAM	Network Advisory Message
NMAS	NASA Account Management System
NASA	National Aeronautics and Space Administration
NCCDS	NCC Data System
NCPS	Network Command Processing System
NIC	Network Integration Center
NIMO	Networks Integration Management Office
NISN	NASA Integrated Services Network
NSG	Network Support Group
NSR	NISN Service Request
OAS	Onizuka Air Station
ODAR	Obsolescence-Driven Avionics Redesign
ORR	Operations Readiness Review
ORT	Operational Readiness Test
PADS	Precision Audio Distribution System
PDL	Ponce de Leon
PDR	Preliminary Design Review
PM	Preventative Maintenance
PMP	Project Management Plan
PMR	Post Mission Review
POC	Point-of-Contact
PRD	Program Requirements Document
PSS	Portable Spacecraft Simulator
PTP	Programmable Telemetry Processor
RAIL	Rolling Action Item List
RF	Radio Frequency
RFSOC	RF Simulations Operations Center
RPS	Record and Playback System
RSA	Russian Space Agency

Network Support Group Acronyms and Abbreviations

RTS	Remote Tracking Site; Reagan Test Site
SAT	Site Acceptance Test
SCaN	Space Communications and Navigation
SCD	Small Conversion Device
SDTO	Station Development Test Objective
SDTW	Space Development Test Wing
SGL	Space-to-Ground Link
SMTF	Software Maintenance and Test Facility
SN	Space Network
SNAS	SN Access System
SRM	Solid Rocket Motor
SSA	S-band Single Access
SSC	Subsystem Controller
SSME	Space Shuttle Main Engine
SSP	Space Shuttle Program
STGT	Second TDRSS Ground Terminal
TCDT	Terminal Countdown Demonstration Test
TDRS	Tracking and Data Relay Satellite
TDRSS	Tracking and Data Relay Satellite System
TOCC	TDRSS Operations Control Center
TNOSP	TDRSS NOSP
TWTA	Traveling Wave Tube Amplifier
ULF	Utilization and Logistics Flight
VAFB	Vandenberg Air Force Base
VHF	Very High Frequency
VV	Visiting Vehicle
WG	Working Group
WR	Western Range
WSC	White Sands Complex
WSGT	White Sands Ground Terminal
WSSH	White Sands Space Harbor
ZOE	Zone of Exclusion