

DATE: September 11, 2012
LOCATION: Regents Park III
SUBJECT: HSF NSG VHF Status Splinter Minutes

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INTRODUCTION

Mr. Fred Pifer convened the September 11, 2012, Network Support Group (NSG) International Space Station (ISS)/Soyuz Very High Frequency (VHF) status splinter meetings to review the VHF stations contingency and emergency communications support status in support of ISS and Soyuz (refer to the presentation, *International Space Station [ISS]/Soyuz Very High Frequency [VHF] Status*).

MEETING

- A. Mr. Pifer stated that there have been no major changes to the VHF network configuration.
- B. The stations provide contingency/emergency support. The VHF-1 license was renewed in May 2012. The White Sands Complex (WSC) antenna upgrade has been completed. WSC test passes will not be scheduled below 20 degrees until the data collection process is complete and a decision can be made to change the requirement to supporting passes below 20 degrees. All stations are available for emergency support to the ISS or Soyuz.
- C. VHF-1 Emergency Communication Verification Passes are scheduled one pass per quarter per station by the Johnson Space Center (JSC) due to limitations on ISS schedules. The network has implemented Station Proficiency Simulations coordinated by the Goddard Space Flight Center (GSFC) Human Spaceflight (HSF) Team. The JSC Ground Controllers (GC) initiate the pass per normal procedures. No ISS crew participation is required. Briefing Messages (BM) will be issued for the passes. A TARS report will be completed following the pass.
- D. There was an issue with the Dryden Flight Research Facility (DFRC) proficiency simulation. A make good service was used for the ISS Site Coordination voice loop. The problem was fixed and tracked in a TARS report. A trouble ticket was opened in the Communications Service Office (CSO) system.
- E. Mr. Pifer reviewed the WSC upgrades. The VHF-1 Operational Readiness Review (ORR) was conducted May 30, 2012. WSC has actions to provide masking and Radio Frequency (RF) antenna pattern surveys and capture 1 year of data to verify the full system capability. An engineering/certification pass was performed on June 25, 2012. The maximum elevation was 20 degrees. It is expected that once the survey work is complete, WSC will be able to return to supporting passes to 5 degrees. Remaining work includes the installation of the remote switching and keying capability, installing the cameras, reconfiguring the 500-Watt High Power Amplifiers (HPA) to 350 Watts, and updating Local Operating Procedures (LOP). Mr. Scott Greatorex asked what the Red item on the presentation page was indicating. Ms. Melissa Blizzard stated that there was a bad cable. The cable has been replaced and the bad cable returned to the vendor.
- F. Mr. Pifer reviewed a high-level station (DFRC, Wallops Ground Station [WGS], and WSC) equipment configuration diagram.
- G. Mr. Pifer reviewed a station major component equipment list.
- H. Mr. Pifer reviewed a WSC, DFRC, and Wallops VHF spares list. Ms. Blizzard stated that the Goddard Space Flight Center (GSFC) spares are being shipped to Wallops. GSFC no longer has a depot. Mr. Gary Morse asked if sparing is an issue. Mr. Bangerter replied that the MRTs are Non Maintainable Equipment (NME). The MRTs were custom built by GSFC/NASA. The network needs a summary of the status to take to the ISS Program (ISSP) to work funding for a phased replacement program. Mr. Mark Harris

stated that the list will be maintained in Maximo. The spares are interchangeable except for the radios. The spares will be tracked by stock number.

- I. Mr. Pifer provided an update on the documentation.
- J. The Tracking and Data Relay Satellite System (TDRSS) Network Operations Support Plan for International Space Station (TNOSP) VHF Annex is undergoing an update. Inputs are owed by WSC. Once the WSC inputs are incorporated, the document will be distributed for a second General Review. The VHF Air-to-Ground (A/G) Communications Maintenance and Operations Manual will be updated to include the new WSC VHF-1 system. The requirement for Private VHF Communications has been removed from the Program Requirements Document (PRD). Private conversations can be called if needed. The Communications Service Office (CSO) has a procedure to inhibit recording on the Mission Operations Voice Enhancement (MOVE) system. This procedure will be included in the TNOSP.
- K. Mr. Scott Greatorex asked that a table be created showing when the sites last radiated. Mr. Pifer stated that he does have a list of the passes supported since the last NSG. (Editor's Note – the table was provided at the NSG Main Forum.)
- L. Mr. Bangarter stated that there are some open items from the VHF-1 upgrade ORR.
 1. RF Antenna Patterns. Mr. Cliff Baxter stated that the work was conducted but there was a setup configuration error and the work has to be redone. There is no specific date set yet for the rework. He stated that he expects a schedule to be available in the next couple of days.
 2. Masking Survey. The results were too coarse. A new procedure is needed to gain finer results. This work will be rescheduled with the RF antenna pattern work. WSC has contacted a Wallops Subject Matter Expert (SME) for assistance. Mr. Morse asked how it occurred that there were problems with both efforts. Ms. Blizzard replied that there were setup problems. Mr. Baxter stated that a spectrum analyzer setting was wrong. The systems will be down a day to do the work. It will take approximately 5 hours for each task.
 3. Remote Switching/Keying. Mr. Baxter stated that this effort is in a flux. Engineering is working a common interface issue. WSC has pulled in an additional engineer to help with the task. There is a possibility that the basic design is flawed. The entire design is being evaluated. The additional engineer assigned to the task believes that he has a simpler design. The requirements need to be compared to the new design. This will take approximately one week. If the new design is viable, WSC will provide a presentation containing a cost and schedule estimate. This capability will allow WSC to remotely switch between the prime and backup chains and allow remote keying of the transmitter. This capability was contained in the VHF-1/-2 systems when the systems were collocated; there was a copper link in the shelter. The capability was removed when equipment was relocated to the Extended TDRSS Ground Terminal (ETGT). Mr. Bangarter stated that the network needs to find any expertise at Wallops to assist WSC.
 4. Cameras. Mr. Baxter stated that the work is fairly simple. The work will be documented in the second Engineering Change (EC) which will contain the as-built configuration of the VHF-2 system. The system was not fully documented and this effort is taking time. The additional engineer is assuming this task. Both ECs should

- be approved in November (switching/keying and camera). The tasks are decoupled, but both tasks are being worked by the same engineer.
5. HPAs. The HPAs were sent out approximately 1.5 weeks ago and should take approximately 2 -3 weeks for the vendor to complete the work. Once the work is done, the final 500-Watt HPA will be sent to the vendor. All HPA's are being converted to 350 Watts. Mr. Mike Yettaw asked what drove this decision. Mr. Baxter answered that an analysis was performed on the link margin budgets. It was found that 500 Watts was overkill. There were different Watt HPAs in each chain. There was also a cable failure and it was found that the power was close to the cable power capacity. It is better to back off to the lower power. Mr. Robert Jones stated that DFRC will provide an updated list of spares to Mr. Ken Clark and the quarterly report to the Spaceflight Mission Managers (SMM).

ACTION ITEM REVIEW

No formal action items were assigned at the September 11, 2012, HSF NSG ISS/Soyuz VHF status splinter meeting.

(Original Approved By)
Fred Pifer
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