

DATE: April 17, 2012

SUBJECT: VHF Status

LOCATION: JSC, Regents Park III

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## INTRODUCTION

Mr. Fred Pifer convened the April 17, 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 reviewed the VHF network configuration. Yellow indicates places where changes have been made on the network. The primary change is the upgrade at the White Sands Complex (WSC). WSC now has dual Quad Yagis (one for VHF-1 and one for VHF-2) and separate towers. The Goddard Space Flight Center (GSFC) Flight Dynamics Facility (FDF) has implemented a modernized system. C-band tracking is no longer a requirement, but can be called up in a contingency/emergency.
- B. Mr. Pifer provided a summary of station support capabilities. VHF-1 uplink radiation is restricted pending license renewal. The renewal is in work by the Johnson Space Center (JSC) Frequency Manager. The renewal date is To Be Determined (TBD). Ms. Cathy Sham, JSC Frequency Manager, reported that she has submitted the Authorization (with new parameters) for all three stations. The submission was made two weeks prior to the NSG. NASA HQ is working to make sure that there is no pre-coordination with the Navy required. VHF-2 uplink requires approval. This is in the hands of the Federal Aviation Administration. It is understood that in a declared emergency, support will be provided to the ISS or Soyuz. All sites except WSC are currently available for that support. In the case of VHF-2 support, regulators and the FAA will be notified.
- C. Mr. Pifer noted that WSC cannot take test passes below 20 degrees due to a high-noise environment. Support will be provided below 20 degrees if an emergency is declared. Mr. Pifer stated that the Quad Yagi configuration does not necessarily change the 20-degree restriction due to the noise floor at WSC. A new evaluation of the noise floor with station masking is needed. Mr. David Glasscock stated that WSC can go to 5 degrees. He stated that he will forward an email to that effect. Mr. Glasscock stated that WSC will do a re-evaluation. Ms. Melissa Blizzard stated that Mr. Cliff Baxter is working this issue. Mr. Bangerter agreed and stated that a survey should be conducted now. An email should be forward to Mr. Turonald Banks to update the program Requirements Document (PRD) for the 5-degree capability at WSC
- D. Mr. Pifer reviewed the VHF-1 Emergency Communication Verification Passes. One pass is scheduled per quarter per station. A proposal has been made to do proficiency passes. The passes would exercise scheduling, interfaces, pass procedures, and voice communications between JSC and the stations. The ISS Ground Controller (GC) will initiate the request per normal procedures. No ISS participation is required. The proficiency pass procedure will be included in the Tracking and Data Relay Satellite System (TDRSS) Network Operations Support Plan (TNOSP). The interval of the passes has not yet been decided. Monthly has been suggested. Mr. J. R. Hendrickson stated that voice quality can't be checked. He asked the objective of the tests. Mr. Ken Jones stated that it provides an opportunity to test equipment and procedures. Mr. Mark Harris stated that Wallops does Station Readiness tests (SRT) and this helps to keep everyone aware. He stated that the monthly exercises were effective and that the quarterly schedule might

not exercise all the correct personnel. Mr. Joe Whitney stated that the ISS would be tracked and no carrier radiation would be authorized.

- E. Mr. Pifer reviewed the proposed station proficiency simulation procedure.
  - 1. The ISS GC submits VHF schedule request.
  - 2. The pre-pass briefing will advise station(s) pass is a simulation support.
  - 3. The WSC Near Earth Network (NEN) Scheduling Office (SO) will schedule the supporting station(s).
  - 4. The stations (Dryden Flight Research Center [DFRC], Wallops Ground Station [WGS], and WSC) will not radiate.
  - 5. The pass will be conducted in accordance with ISS TNOSP VHF Annex H-90 Interface and Pass/Post-pass Activities.
- F. Mr. Pifer reviewed the WSC upgrades. Mr Pifer reported that the VHF-1 Quad Yagi antenna and tower installation are complete. Equipment was relocated to the Extended TDRS Ground Terminal (ETGT). Tone checks were completed in mid March. Elevation drive damage was reported on March 21 and the system was turned RED. The vendor was called in and the damage repaired. Then, on March 28, voice configuration issues were reported that could cause echo on the VHF uplink to the ISS crew. This issue is under investigation. The voice has been interfaced to the Mission Operations Voice Enhancement (MOVE) system and the antenna movement checked out. The system is YELLOW and will remain so until WSC and the Network Director (ND) are ready. Ms. Blizzard stated that verification testing needs to be completed and then the system will be YELLOW.
- G. Mr. Pifer reviewed the station equipment configurations and stated that there are no changes.
- H. Mr. Pifer reviewed the station major component equipment list. The items marked in Red are changes. This list will be updated further.
- I. Mr. Pifer reviewed the documentation. The TNOSP for ISS, Revision 1, is in a major rewrite. The System Equipment Manual is being updated. Mr. Pifer reviewed the VHF Private Communications requirement that the Integrated Network (IN) elements and VHF stations are required to terminate all audio monitoring and recording on prior notice. He stated that MOVE had been reported to not have the capability for cancelling recording of digital voice. Private Air-to-Ground (A/G) is a scheduled event and in the past, stations turned off their speakers and inhibited recording. Mr. Ken Jones suggested disconnecting the audio channel. Mr. Randy Honeycutt stated that the Stancil recorders record the channels and it is possible to stop recording on all the channels. Mr. Scott Douglas stated that it should be possible to unmap the VHF channel going into the Stancil recorder. Mr. Mark Harris suggested deleting the recording. Mr. Pifer stated that he is exploring options. Mr. Jones stated that the Program Requirements Document (PRD) was scrubbed and although it would require several layers of failure, this is still a valid requirement. Mr. Douglas asked that CSO/NISN be allowed time to do an analysis. Is this an issue for the GSFC switch or other switches? Mr. Mike Yettaw stated that DFRC does not have a MOVE switch. Mr. Douglas asked where the VHF conference transverses the MOVE switch and is it possible to tell Voice Control to unmap the channel or do the sites have to do something extra that increases the chance for error? Mr. Douglas stated that he cannot change the MOVE switch at the four locations; that would be more chance for error. Mr. Scott Douglas accepted an action item to determine where the VHF configuration

transverses MOVE and determine what methods can be used to support VHF Private Conversations (e.g., unmapping paths, deleting recorded files, etc.) (Note - Wallops and DFRC are excepted.) (action item 0412-NSG VHF Status-01). (Editor's Note: Mr. Douglas provided the following response. GSFC and WSC are the only two sites that route the VHF through the MOVE Switch. At GSFC, Voice Technical Operations (VTO) has a procedure for supporting private conferences as part of their Certification Test for all Operators. NASA Integrated Communications Services [NICS] will help WSC develop procedures for configuring private conferences if they need GSFC assistance. Although it is considered a simple enough process that the standard MOVE Training already provided should suffice. This action item is **CLOSED**.)

- J. Ms. Cathy Sham asked that she be notified if the VHF-1 or VHF-2 is activated to provide an emergency uplink. Mr. Bangerter stated that he would notify Ms. Sham when he notified Mr. Scott Galbraith.
- K. Mr. Mark Harris stated that Wallops has reviewed its spares and has 3 spare VHF test sets. The test sets are obsolete and hard to repair. DFRC and WSC have issues with the spares they have. DFRC is having problems calibrating theirs. A replacement needs to be identified. Mr. Robert Jones accepted an action item to check the DFRC inventory for VHF Test Set spares (action item 0412-NSG VHF Status-02). (Editor's Note: Mr. Jones reported that DFRC does not have spare VHF test sets. This action item is **CLOSED**.) Mr. Ken Clark was assigned an action item to track VHF Test Set sparing and provide an inventory/status (action item 0412-NSG VHF Status-03).
- L. Mr. Alan Schonbrunner stated that money is needed to provide newer solutions for upgrading the VHF-1 and -2 systems. Mr. Bangerter responded that a list is being created to track equipment sustainability. The Space Communications and Network Services (SCNS) contract is responsible to sustain the equipment and should be making recommendations. Funds would have to be pursued from the ISS Program (ISSP). Mr. Schonbrunner suggested that vendors be brought in to evaluate the sites and suggest options.
- M. Mr. Whitney stated that the sites need guidance on conducting the proficiency sims. Mr. Pifer stated that Mr. Kevin Riley has submitted an input and the procedure was forwarded to the GCs for review. Mr. Whitney stated that Ms. Karen Rogers responded and stated that the procedure looks good. Mr. Earl Daniel stated that he is reworking the TNOSP and will send it out for review again. Mr. Bangerter asked that the review period be a short period. He stated that the sims should start if the procedure is already documented. Ms. Blizzard stated that WSC is needed to be available first. Mr. Bangerter stated that Wallops and DFRC could begin now.

**ACTION ITEM REVIEW**

The following action item was assigned at the April 17, 2012, NSG VHF station status splinter meeting.

AI No.	Assignee	Action	Response	Status
0412-NSG VHF Status-01	Scott Douglas/ GSFC/NASA/	Determine where the VHF configuration transverses MOVE. Determine what	GSFC and WSC are the only two sites that route the VHF through the MOVE Switch.	<b>Closed</b>

AI No.	Assignee	Action	Response	Status
	CSO	methods can be used to support VHF Private Conversations (e.g., unmapping paths, deleting recorded files, etc.) Note - Wallops and DFRC are excepted.	At GSFC, VTO has a procedure for supporting private conferences as part of their Certification Test for all Operators. NICS will help WSC develop procedures for configuring private conferences if they need assistance. It is considered a simple enough process that the standard MOVE Training already provided should suffice.	
0412-NSG VHF Status-02	Robert Jones/ DFRC	Check the DFRC inventory for VHF Test Set spares.	DFRC does not have spare VHF test sets.	<b>Closed</b>
0412-NSG VHF Status-03	Ken Clark/ GSFC/SCNS	Track VHF Test Set sparing and provide an inventory/status.		<b>Open</b>

(Original Approved By)  
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