

DATE: September 17, 2002

SUBJECT: STS-107 Overview Splinter

LOCATION: University Baptist Church, Room 331, Houston, Texas

TIME: 0830 – 0930

ATTENDANCE:

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INTRODUCTION

Mr. John Smith convened the September 17, 2002, Network Support Group (NSG) STS-107 Network Support Overview splinter meeting at the University Baptist Church, Room 331. Mr. Smith welcomed the attendees to the meeting and provided copies of his presentation (*STS-107 Network Support Overview*). Mr. Smith reviewed the agenda stating that topics of discussion would include Ground Internet Protocol (IP) Network, Unique Equipment, interfaces, and any resulting issues.

STS-107 OVERVIEW

- A. Overview. Network support for the Space Shuttle will be planned through coordination with The Johnson Space Center (JSC) Mission Operations and the Integrated Network. STS-107 is a science mission with Hitchhiker (HH) payloads.
- B. Communications and Navigation Demonstration on Shuttle (CANDOS) Experiments Overview. The block diagram illustrates the interfaces for the experiments. CANDOS comprises 5 experiments: GPS Navigation, Ground Network (GN) Communications, Space Network (SN) Communications, On-orbit Low Power Transceiver (LPT) Reconfiguration, and Space-based Range Safety (RS). CANDOS is a Goddard Space Flight Center (GSFC) project designed to demonstrate the versatility of the GSFC LPT. Communications will be through the Tracking and Data Relay Satellite System (TDRSS) and Dryden Flight Research Center (DFRC), Merritt Island (MILA), and Wallops Flight Facility (WFF). Mobile IP will be used. This allows for automatic routing of data.
- C. Unique Equipment. Mobile IP routers have been installed at WFF, MILA, and the White Sands Complex (WSC). The Ground Remote Interface Device (GRID) will provide data interface to and from the Radio Frequency (RF) equipment and provide data encoding and decoding and data conversion for router input and output. The Launch Head Transmitter has been installed at DFRC. This will provide Doppler compensated forward link BPSK PN-spread TDRS-mode interface at DFRC for the LPT. A manual switch is being incorporated into the CANDOS configuration in the event the DFRC system is required for Space Shuttle support.
- D. Schedule. Each site has tested equipment locally and end-to-end (except MILA). A loop back problem (due to different data rates) exists and is being worked.
- E. Network Utilization. CANDOS will use the S-band high frequency and the Space Shuttle will use the S-band low frequency. There are 41 scheduled SN events, equaling approximately 24 hours total. Single Access (SA) is required for all RS events that use TDRSS. CANDOS can use Multiple Access (MA) two-way service if required. At JSC direction, Virtual Spacecraft (V/S) events will be scheduled (K-band for Space Shuttle and S-band for CANDOS). DFRC will be used only for RS events. GN comm will be via MILA and WFF.
- F. Network Operations. The primary interface will be the Network Operations Managers (NOM) and the STDN Mission Managers (SMM). The Space Network Web Services Interface (SWSI) will be used as the backup for scheduling SN resources. Although SWSI has been through all its required reviews, it has not been declared operational and is backup.

- G. Network Security. All issues have been resolved. Access to the Closed IONET has been approved. The Security Checklist, Security Plan, and Risk Assessment have been completed and approved. All National Agency Checks (NAC) have been submitted and are being completed.
- H. Conclusions. CANDOS has participated in various GSFC Integrated Simulations (GIS) and Johnson Space Center (JSC) Integrated Simulations (JIS) and more are scheduled. CANDOS documentation is in place and available via the CANDOS web site.

DISCUSSION

The following items were discussed at the meeting:

- A. Mr. Bruce Schneck stated that originally the project had requested that support for the entire mission be scheduled as critical support. It was not possible to provide this support. There are 251 identified critical periods throughout the mission. An agreement was worked. Mr. Bryan Austin stated that Ms. Kelly Beck agreed to group critical periods by experiment start/stop time into larger critical periods. The separate events are still identified as critical period events, but they have now been grouped. To block the events was more efficient from a network perspective. JSC will deconflict Space Shuttle and International Space Station (ISS) conflicts. TDRS 47, one SA link will be dedicated to the mission. Mr. Schneck commented that this is the busiest experiment to date. There will many challenges to scheduling. Mr. Austin commented that many of the events build on each other and it is important that the first couple of days go off as scheduled. Mr. Frank Stolarski stated that as the mission approaches, the International Space Station (ISS) critical period can be reviewed to look for options.
- B. There has been some discussion regarding Marshall Space Flight Center (MSFC) voice loops to Glenn Research Center (GRC). Because CVX is very sensitive to temperature and Space Shuttle movement, additional voice loops have been discussed. CVX is a part of FreeStar. There is a network interface to the Florida Institute of Technology (FIT). Mr. Bill Manning stated that Mr. Jason Bell is the point-of-contact and has requested that the T-1 be extended through April. The intent had been to shut down the T-1 and reorder closer to the new mission date. Everything is in place and the T-1 has been re-ordered. The FIT equipment was not removed. Mr. Ball also acts as the liaison to the European Space Agency (ESA).
- C. Ms. Michele Mascari stated that NASA Integrated Services Network (NISN) has installed unique equipment connected to the routers and asked when the equipment is scheduled to be disconnected after the mission. Mr. Ron Parise stated that it will depend on other mission questions. Other projects such ChipSat are looking at using the same configuration. Ms. Mascari stated that some of the ports need to be released. Mr. Norman Reese stated that NISN needs to know what is planned to adequately schedule/order resources. Mr. John Smith accepted an action item to determine the schedule for disconnecting the STS-107 unique equipment from the NISN routers (action item STS107-09-02-01).
- D. Mr. Roy Warner asked if there were plans to use TDRS-8. Currently, there are not many users on TDRS-8. The satellite is in the West and would help to alleviate scheduling concerns. Use of SMA could be demonstrated. He reminded the attendees that no Line

Outage Recorder (LOR) support at WSC will be provided for interfaces that use a Local Interface (LI). CANDOS uses an LI to interface with the Mobile IP equipment.

- E. Mr. Bryan Austin asked if there were any launch commit criteria for STS-107 experiments. None are currently documented. Messrs. John Smith and Ron Parise stated that there were none.

(Original Approved By)

John Smith, Chairman