

SUBJECT: HTV-2 Mission Operations Readiness Review (MORR) Minutes

DATE: November 30, 2010

PLACE: GSFC, Building 8 Auditorium

TIME CONVENED: 1400

TIME ADJOURNED: 1500

ATTENDANCE

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WELCOME/INTRODUCTION

Mr. Jim Bangerter convened the November 30, 2010, H-II Transfer Vehicle (HTV)-2 Mission Operations Readiness Review (MORR) to assess the readiness of the Integrated Network (IN) to satisfy the requirements for the HTV-2 mission (refer to the presentation package, *H-II Transfer Vehicle-2 [HTV] Mission Operations Readiness Review*).

The HTV-2 Review Board members are as follows:

- Mr. Scott Greatorex, GSFC, Code 450.1, Chief, Networks Integration Management Office.
- Robert L. Jones, GSFC, Code 599, 450 Senior Technical Authority.
- Bradford Butts, GSFC, Code 761, Systems Management Branch.
- Mr. Dennis Woodfork, GSFC, Code 595, Navigation and Mission Design Branch.
- Mr. Joe Aquino, JSC, Manager, JSC DD13, Space Communications Integration Office (Ms. Jewel Hervey signing for).
- Mr. Donald Shinnors, GSFC, Code 452, Space Network Project.
- Mr. James Bangerter, GSFC, Code 450.1, Human Spaceflight Network Director.

WELCOME

Mr. Jim Bangerter provided a welcome to the attendees.

HTV-2 MISSION OVERVIEW

Mr. Erik Richards provided an HTV-2 Mission Overview.

- A. Project Mission Summary. Mr. Richards reviewed the objectives of the mission. HTV-2 is an unmanned resupply spacecraft developed by the Japanese Aerospace Exploration Agency (JAXA) to deliver equipment, spare parts, and consumables to the International Space Station (ISS).
- B. Events. Mr. Richards reviewed the HTV-2 mission events.
- C. Mission Summary. Mr. Richards provided a mission summary. The launch is currently scheduled for January 20, 2011. The launch time is Day of Year (DOY) 020 at 0629Z. The launch vehicle is an H-IIB from JAXA's Tanegashima Space Center (TnSC) on Tanegasima Island. The primary payload is 6 tons of supplies and scientific payload. Docking is scheduled for January 27, 2011. Undocking is scheduled for February 24 2011. HTV will be docked for 27 days. Re-entry is scheduled for February 26 2011.
- D. ISS Supply Sequence. Mr. Richards reviewed the ISS supply sequence.

INTEGRATED NETWORKS REQUIREMENTS

Mr. Richards provided the IN requirements. Mr. Richards reviewed the Eastern Range (ER), NASA Integrated Services Network (NISN), Flight Dynamics Facility (FDF), Space Network (SN), and Network Integration Center (NIC) requirements. He noted that these are the same requirements as for the Automated Transfer Vehicle (ATV). There were no issues.

LAUNCH HOLD CRITERIA

Mr. Richards reviewed the launch hold criteria. There is one item; Flight Rule (F2-1 B.2) states that a Tracking and Data Relay Satellite (TDRS) is required as part of the launch criteria for HTV-2.

NETWORKS CONFIGURATION

Mr. Richards reviewed the HTV-2 support networks configuration. Mr. Scott Greatorex asked who operated the ISS Downlink Enhancement Architecture (IDEA) link. Mr. Bangerter replied that IDEA is a White Sands Complex (WSC)/Johnson Space Center (JSC)/Marshall Space Flight Center (MSFC) NISN service, but that IDEA equipment is managed by JSC. Mr. Al Duany stated that any problems are reported to the NISN COMMGR. Mr. Joe Aquino stated that the link is designated as a Mission Critical service.

DOCUMENTATION

Mr. Richards reviewed the HTV-2 mission documentation. Documentation is up to date. The list includes the Interim Support Instructions (ISI) to be published.

ANALYSIS AND TESTING

- A. Radio Frequency (RF) Analysis. Ms. Ronna Kirchoff provided an RF analysis summary.
 - 1. HTV command support may be requested for S-band Single Access (SSA), S-band Multiple Access (SMA), or MA. For critical operations or in case of an emergency in which HTV loses attitude, SSA or SMA services are used for the forward link. The HTV project has stated that Multiple Access Forward (MAF) and S-band Multiple Access Forward (SMAF) services are requested on a best-effort basis. All forward links are positive.
 - 2. MA Return (MAR) and S-band MAR (SMAR) support may be requested by the HTV project on a best-effort basis. All other return service margins result in positive values using specified values, except for SMAR 2-kbps support through both the Zenith and Nadir antennas (previously only required for SSAR; however, link margin is positive using compatibility test measurement data. Return cases meet the requirements.
 - 3. The RF interface Control Document (ICD) is in the process of being updated to reflect additional potential support modes. These support modes have been considered in this summary.
 - 4. Ms. Kirchoff reviewed the RF forward link coverage table.
 - 5. Ms. Kirchoff reviewed the RF return link coverage table.
 - 6. Ms. Kirchoff reviewed the RF return link coverage (HTV project requested support on a best-effort basis) table.
- B. Network Feasibility Analysis. Mr. Mike Virden provided a network feasibility analysis summary.
 - 1. Evaluations of Forecast Period ATV launch requirements indicate no additional impacts should be expected than is currently experienced in scheduling for any other expendable Launch Vehicle (ELV) or Launch and Early Orbit (LEOP) customer as long as the launch window duration is minimized.
 - 2. The proposed method of scheduling either SSA or MA support should not cause any additional loading issues.
- C. RF Compatibility Testing Results. Mr. Ralph Zimmerman provided an RF compatibility testing results summary. HTV Category-II RF compatibility testing was conducted at the Compatibility Test Laboratory (CTL) from April 17 – 26, 2007. The MDA Proto-Flight Model Transponder was tested. The MDA Flight Transponder is prime on HTV-2 and was flown successfully on HTV-1. No anomalies were found during the testing. The

HTV Proto-Flight Model Transponder (MDA) is RF compatible with the SN. The HTV-2 Second Generation Transponder RF compatibility testing was conducted at the CTL from March 3 – 12, 2010. At this time, the MELCO Proto-Flight Transponder was tested. The MELCO Flight Transponder is backup on HTV-2. No anomalies were found during the RF compatibility test. The HTV Second Generation Proto-Flight Transponder (MELCO) is RF compatible with the SN.

NETWORKS REQUIREMENTS VERIFICATION RESULTS

Mr. Richards provided a networks requirements verification results summary. End-to-End (ETE) testing was conducted and all objectives met. Some testing remains (e.g., WSC Mission Readiness Test [MRT], FDF Vector Verification tests, and L-3 day circuit checkouts). Mr. Richards reviewed the HTV-2 test matrix. Mr. Greator asked if there was radiation during the ETE tests and Mr. Richards replied that there was.

LAUNCH ACTIVITIES

Mr. Richards reviewed launch activities. Mr. Richards reviewed the launch day sequence of events (launch count). Spaceflight Mission Manager (SMM) staffing and activities were outlined. Mr. Richards reviewed the IN timeline summary. All mark events are shown on the timeline. Mr. Richards reviewed the IN Freeze Plan.

NETWORKS STATUS

Representatives from the IN elements provided an element status and support readiness statement.

- A. ER Operations. Mr. Mike Gawel provided an ER status. There have been no ER configuration changes since the last mission. There are no open Discrepancy Reports (DR). There are no outstanding documentation items. Staffing is sufficient to meet all requirements. All required personnel are trained and certified. Mr. Gawel stated that JDI, Merritt Island Launch Annex (MILA), and Wallops radars will be used. The ER is ready to support the HTV-2 mission.
- B. SN. Mr. Manuel Rios provided an SN status. SN Access System (SNAS) release 4 has been postponed. Release 10006 has been rescheduled for January 2011. The Mission Operations Voice Enhancement (MOVE) NTR cutover has been December 5, 2010. The antenna Sub-System Controller (SSC) is slipping to January 2011. Guam Data Interface System-Replacement (GDIS-R) has been accepted. TDRSS operations Control Center (TOCC) upgrades are complete. Mr. Rios reviewed the fleet status. The next eclipse season is 01/21/11 through 03/23/11. There are no open DRs. There are no outstanding documentation items. Staffing is sufficient to meet all requirements. All required personnel are trained and certified. Mr. Rios stated that the SN is ready to support the HTV-2 mission.
- C. FDF. Mr. Pepper Powers provided an SN status. FDF will be using the ISSONet for vector transfers between FDF and JSC/ISS Trajectory Operations Officers (TOPO). ISSONet has been operational since June 2010. There are no open DRs. There are no outstanding documentation items. Staffing is sufficient to meet all requirements. All required personnel are trained and certified. The FDF is ready to support the HTV-2 mission.

- D. NISN Operations. Ms. Claudette Wiley provided a NISN operations status. There are 5 voice loops and 4 data interfaces. There have been no configuration changes since the last mission. There are no current open Problem Management Dispatch System (PMDS) items. There are no outstanding documentation items. Staffing is sufficient to meet all requirements. All required personnel are trained and certified. NISN will process all Freeze Exemption Requests (FER) during the mission in accordance with NISN SOP-002. Ms. Wiley stated that NISN is ready to support the HTV-2 mission.
- E. Network Integration Center (NIC) Operations. Mr. Eric Mount provided a NIC operations status. There have been no NIC configuration changes since the last mission. There are no open Discrepancy Reports (DR). There are no outstanding documentation items. There are two FERs and both have been approved. Facilities are GREEN. Staffing is sufficient to meet all requirements. All required personnel are trained. Mr. Mount stated that the NIC is ready to support the HTV-2 mission.

INTEGRATED NETWORK SUMMARY

- A. Risks. Mr. Richards reviewed the network risks. There is one risk on the NISN MOVE Switch Failure. If the MOVE system switch experienced a failure at the connection point to the system interface cards, then the switch would fail which would impact GSFC local elements and NIC who will lose voice contact with their customers and supporting elements. As mitigation, meet-me numbers or direct black phone numbers will be provided for all missions that have critical voice requirements. The prime MOVE switch does have some internal redundancy; however, there is no MOVE backup switch to provide overall redundancy.
- B. Standard open work includes WSC MRT, FDF Vector Verification, and L-1 day circuit checkout. There is no non-standard open work.
- C. There are no issues or concerns.
- D. The IN is ready to support the HTV-2 mission.

REVIEW BOARD CERTIFICATION

The HTV-2 MORR Review Board signed the Certificate of Flight Projects Directorate Networks Readiness certifying that, with successful completion of flight readiness preparations and closure of associated action items, all integrated network elements are ready to support the HTV-2 mission. All board members stated that the IN was ready to support with the closure of the open items.

RFA REVIEW

No RFAs were assigned at the November 30, 2010, HTV-2 MORR.

ACTION ITEM REVIEW

No action items were assigned at the November 30, 2010, HTV-2 MORR.

(Original Approved By)
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