

DATE: October 19, 2011

LOCATION: Regents Park III, Room 201

SUBJECT: HSF NSG ATV-3 Splinter Minutes

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INTRODUCTION

Mr. Thomas Russell convened the October 19, 2011, Human Spaceflight (HSF) Network Support Group (NSG) Automated Transfer Vehicle (ATV)-3 mission planning status splinter meeting to provide a mission overview and discuss mission planning and support requirements (refer to the presentation, *Automated Transfer Vehicle-3 [ATV] Mission Planning Status*).

MEETING

- A. Mission Overview. ATV-3 is named for Edoardo Amaldi, who is an Italian physicist and credited as being the father of the Italian Space Agency. The launch date is currently scheduled for February 29, 2012. Launch time is To Be Determined (TBD). The launch vehicle is the Ariane 5. The launch site is Kourou, French Guiana. The ATV Control Center (CC) is located in Toulouse, France. Rendezvous with the International Space Station (ISS) is scheduled for March 19, 2012.
- B. Integrated Network (IN) Overview. The diagram illustrates how ATV-3 will be supported by the network elements. The Backup Control Center (BCC) Huntsville Operations Support Center (HOSC) is located at the Marshall Space Flight Center (MSFC). Mr. Russell also reminded the attendees that the Tracking and Data Relay Satellite (TDRS) events being supported from the HOSC have a different forward Logical Port Address (LPA) than the events being supported via the Mission Control Center – Houston (MCC-H). This would require a delete/add of the events to reflect the transition to the HOSC and same would apply when transitioning back to MCC-H.
- C. Changes since ATV-2. S-band Multiple Access (SMA) / Multiple Access (MA) engineering passes were successfully supported during on-orbit passes. SMA / MA 64-kbps High Data Rate (HDR) service will be used for ATV-3. An update to the Radio Frequency (RF) Interface Control Document (ICD) is expected from the European Space Agency (ESA). The Network Program Requirements Document (NPRD) and Tracking and Data Relay Satellite System (TDRSS) Network Operations Support Plan (NOSP) (TNOSP) will be updated as well.
- D. Documentation. Mr. Russell reviewed the ATV-3 documentation set. A Critical / Super Critical Period Interim Support Instruction (ISI) will be distributed. He requested that the inputs be received 21 days in advance if possible.
- E. Mission Profile. Mr. Russell reviewed the mission profile diagram. Support will be provided by TDRS-Spare and TDRS 171. The mission profile provides a mission timeline.
- F. Space Network (SN) Support
 1. TDRSS SA, SMA, and MA services will provide support for prelaunch, launch, insertion, parked, docked, and reentry operations. Mr. Russell reiterated that an update from ESA is expected for the 64-kbps SMA HDR. Continuous S-band Single Access (SSA) support will be provided for Launch & Early Orbit Phase (LEOP).
 2. Virtual Spacecraft support is being worked; although, it was stated by Johnson Space Center (JSC) that virtual spacecraft support is unlikely for ATV-3.
 3. Configuration codes and test procedures are open work items.
 4. RF Performance Data was requested daily. Mr. Jim Bangerter stated that this is too much for the White Sands Complex (WSC) to accommodate (work load and cost). Mr. Joe Whitney stated that the JSC Ground Controllers (GC) did push back on the request during ATV-2. Ms. Elizabeth Clark stated that the requests were sporadic.

- The GCs informed ESA that the data was on request. Ms. Clark suggested that ESA could request Eb/no readings in real time. Mr. Bangerter stated that he will not levy the daily requirement on WSC. If there is an anomaly or ongoing problem, JSC can request the data through the normal process. Mr. Bangerter stated that he has action to discuss this with ESA and believes that they do understand and this is very close to being settled. He stated that he will close the loop with WSC (Messrs. David Glasscock and Erik Richards).
5. WSC media hold requests need to be submitted prior to 50 hours.
 6. The ISS GC will transmit a Ground Configuration Message Request (GCMR) to offset the forward frequency. This will be documented in an ISI. MA / SMA cannot be offset.
- G. Eastern Range (ER) Support. ER C-band support will be contingency support only. The C-band procedure is being finalized and documented in the TNOSP ATV annex. An ISI will be published prior to the mission.
- H. Goddard Space Flight Center (GSFC) Support
1. Network Integration Center (NIC). NIC personnel will plan, conduct, and support pre-mission testing; interface with the IN; monitor SN events for all phases of the mission; generate ISIs; assist in fault isolation as needed, assist JSC in resolving SN scheduling conflicts; and conduct shift briefings for each shift.
 2. Flight Dynamics Facility (FDF). FDF will:
 - (a) Provide pre-mission analysis of TDRSS coverage.
 - (b) Provide onorbit determination support using coherent TDRS tracking data after insertion, prior to and after maneuvers, and daily during non maneuver periods to docking.
 - (c) Provide acquisition data to the SN based on ATV vectors received from the ATV-CC via JSC or from FDF orbit determination solutions.
 - (d) Provide TDRSS vector support to JSC and ATV-CC.
 - (e) Evaluate ATV-3 tracking data.
 - (f) Receive pre-mission trajectory data / vectors from JSC. JSC will ensure coherent TDRSS tracking events are schedule pre and post maneuver.
 - (g) Provide a state vector based on TDRS coherent mode tracking NLT 2 hours prior to the first deorbit burn.
 - (h) Provide a second state vector based on TDRS coherent mode tracking NLT 2 hours after the first deorbit burn.
 3. NASA Integrated Services Network (NISN). The Communication Service Office (CSO) NISN will provide voice communications, data transport, and assist in fault isolation as needed.
- I. Network Testing. Mr. Russell reviewed the testing completed to date and planned testing. The question was raised as to whether the L-4 and L-3 tests will both be conducted as they seem to be the same type of tests. Mr. Whitney stated that he will determine the requirements for the two tests.
- J. IN Staffing Plan. GSFC NIC, WSC engineering support, and FDF staffing is TBD. NISN Comm. Manager staffing is 24x7 and Mission Comm. Manager Support is TBD.
- K. ATV-2 Lessons Learned. Mr. Russell reviewed ATV-2 Lessons Learned.
1. Late Scheduling of ATV-2 critical launch events. The late scheduling of critical launch events left gaps in the coverage. NASA has come to a good understanding

with the ESA Flight Directors (FD). We provide ESA with our schedule for the first 3 orbits. ESA has an understanding of why NASA cannot provide 8-12 hours of continuous coverage before liftoff. Procedures have been put in place to improve managing rescheduling of TDRS communications for launch slips.

2. ATV Loss of telemetry via TDRS. Three scheduled TDRS-East events did not lock on ATV telemetry. The ATV vector was not up to date at WSC. Mr. Warren Mitchell stated that this occurred due to reboots activity. The ISS vectors were up to date while the ATV vectors were not. FDF has taken steps to ensure this will not happen again. FDF has updated its procedures. Mr. Bangerter asked that FDF keep a close eye on updating the vectors over any 3-day weekend.
3. FDF support for ATV-2 Reentry. There is no requirement for orbit determination. The JSC Trajectory Operations Officer (TOPO) requested FDF to provide a solution vector based on coherent events prior to the first burn. FDF provided the support. The NPRD needs to be updated. Procedures will be documented in the FDF Mission Support Plan (MSP).

L. ATV-3 IN Team. Mr. Russell reviewed the team members.

M. Discussion

1. Mr. Bob Marriott asked how TDRS changes will be communicated to the ATV planners. Mr. Bangerter stated that there are going to Space-to-Ground Link (SGLT) changes that can impact the location of the SMA. We need to work with Mr. Rich Romansky to where the SGLT handovers are and how they will impact SMA services. The network can provide a schedule for JSC to take to ATV. At this time SMA is expected to be in the West. This can and probably will change in the future. As soon as the network knows, JSC will be informed.
2. Mr. Marriott asked how this will get to the projects. The project plan on 1 and 2. Mr. Bangerter stated that he planned to discuss this at the meetings with ATV-3 next week, which have been postponed. He stated that he will get with Mr. Romansky to see if there are firmer plans. He will send an email to the GCs. Mr. Bangerter accepted an action item to confirm TDRS changes with Mr. Rich Romansky and communicate those changes to the JSC GCs via email (action item 01192011-ATV3-01).
3. Mr. Whitney stated that the GCs can't take action until a Network Advisory Message (NAM) is released. The NAM is the official notification for JSC. ATV can be told to plan at a high level and the project notified when the NAM is released. This how it was worked on ATV-2. The GCs would rather wait for the NAM.
4. Mr. Bangerter suggested a pre-brief to better educate ATV to the process. He agreed that the NAM is the official notification. He suggested that, perhaps, NAMs could go out earlier.
5. Mr. Whitney stated that it is unlikely that ATV will schedule the 64-kbps MA. It should not be expected. There is a perception by some at the project that it will not work. Some at the project think that there is a link margin issue. Mr. Bangerter asked that ATV be invited to participate in engineering passes. It can be demonstrated that there is no issue and ATV can be told that the service will not be used for critical support. Mr. Whitney stated that the ATV ops group is willing, but the hesitation is on the part of the engineering group. Ms. Cathy Sham stated that she has had a conversation with ATV on this and there is some concern from them with

the specification. She has asked them to consider actual performance. Ms. Sham stated that she will determine who to talk to at ATV on this topic.

6. Mr. Turonald Banks asked how the ATV coherent support for the deorbit burn will be documented other than in the FDF MSP. It was stated that the NPRD needs to be updated. Mr. Bangerter stated that it can be documented in an ISI for the next mission.
7. Mr. Bangerter stated that TDRSS time needs to be tracked including test time. WSC needs to use its tracking software to track the TDRSS time. This data is needed for billing purposes. Ms. Clark stated that WSC was asked for the data and it has been provided. Mr. Bangerter accepted an action to send an ATV-3 TDRSS time usage email request to create the proper paper work trail (action item 10192011-ATV3-02). Ms. Clark will let Mr. Bangerter know when the software is activated for the next mission.

ACTION ITEMS

Two action items were assigned at the October 19, 2011, HSF NSG ATV-3 mission planning status meeting.

01192011-ATV3-01	Jim Bangerter/ GSFC/ NASA/ HSF ND	Confirm TDRSS changes with Mr. Rich Romansky and communicate those changes to the JSC GCs via email.	Open
01192011-ATV3-02	Jim Bangerter/ GSFC/ NASA/ HSF ND	Send an ATV-3 TDRSS time usage email request to create the proper paper work trail.	Open

(Original Approved By)
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