

DATE: September 10, 2012

LOCATION: Regents Park III

SUBJECT: HSF NSG FDF VV Requirements Splinter Minutes

ATTENDANCE:

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Whitney	Joe	joseph.l.whitney@nasa.gov	JSC/GC Office	281-483-6878

INTRODUCTION

Ms. Crystal Ramirez convened the September 11, 2012, Human Space Flight (HSF) Network Support Group (NSG) Flight Dynamics Facility (FDF) Visiting Vehicles (VV) Requirements splinter meeting to review proposed changes to the FDF VV requirements (refer to presentation, *FDF Visiting Vehicles Requirements Discussion*).

MEETING

- A. Ms. Ramirez reviewed proposed changes to the Configuration Management Freeze Policy (450-CMFP-HSF/ELV).
 1. The document has an expiration date of June 2012. Ms. Liz Clark stated that the document is in the process of being updated and the date will be corrected as part of the update.
 2. The column referencing the freeze schedule for Shuttle should be deleted.
 3. The freeze policy specifies that the FDF will freeze at Launch (L)-7 days. Ms. Ramirez stated that Ms. Sue Hoge is requesting that the FDF use the Expendable Launch Vehicle (ELV) freeze policy for VVs until VVs become human-rated.
 4. Mr. Jim Bangerter stated that the freeze is based on the Vector Verification (Vector/Ver) test. He recommended that the FDF coordinate with the Spaceflight Mission Manager (SMM) to schedule Vector/Vers no later than L-3 days.
- B. Ms. Ramirez reviewed proposed changes to the International Space Station (ISS) Orbital Volume-I Program Requirements Document (PRD).
 1. Only the European Space Agency (ESA) maintains a timeline requirement for trajectory exchange information exchange. Per the PRD, ESA is required to provide initial trajectory data at L-18 months to L-1 month, and detailed trajectory data at L-30 days to L-1 day. Ms. Ramirez stated that the FDF would like to hold Japan Aerospace Exploration Agency (JAXA) to this same timeline.
 2. Ms. Ramirez stated that on the last mission, the FDF did not receive the pre-mission vector until L-11 days and the L-1 vector was received at L-12 hours. This made it difficult for FDF to generate and deliver its products in a timely manner. Ms. Ramirez noted that she had discussed this with the Trajectory Operations Office (TOPO), and they may not have been aware of the situation. She reiterated that JAXA should be held to the same requirement as ESA.
 3. Ms. Ramirez noted that three days before the last mission, JAXA requested FDF to provide Orbit Determination (OD) data for a 7 day period from launch to docking. They referenced the blanket statement in the PRD that FDF has the ability to provide OD support, if required. This information is usually only provided post insertion. Ms. Ramirez stated that the FDF is requesting to add a requirement for ESA and JAXA to clarify OD expectations for Goddard Space Flight Center (GSFC) FDF during the L-18 Month to L-1 Month timeframe.
 4. Mr. Bangerter stated that these types of requests need be documented as requirements because they drive the level of effort, staffing, and costs. He requested that Ms. Ramirez provide Mr. Joe Whitney with information for the proposed request to levy a requirement on JAXA to provide trajectory data at L-18 month to L-1 month and at L-1 month to L-1, and the proposed request to have ESA and JAXA notify TOPO of OD expectations from FDF when the pre-mission trajectory data is provided (**action item 091012-FDF VV Reqt-01**). Mr. Whitney accepted an action item to discuss

- FDF's proposed requests with TOPO and to coordinate the requirements updates to the PRD and the Operations Interface Procedure (OIP) document (**action item 091012-NSG FDF VV Reqt-01**).
4. Ms. Ramirez stated that the FDF will not be providing Launch Vehicle (LV) support for ESA or JAXA; therefore, the LV trajectory requirements can be removed from the PRD.
 5. Mr. Bangerter was asked if the One-way Doppler requirement be included in the PRD. He replied that this type of information could be included in the PRD as a note.
 6. Ms. Ramirez stated that the FDF is proposing to remove C-band Radar support for SpaceX and Orbital from the ISS Orbital Volume-1 PRD, as these requirements are maintained in separate Annexes.
 7. Ms. Ramirez stated that the ISS State Vectors requirement should be renamed "ISS and Visiting Vehicle State Vectors", and the requirement should be modified to read, "The JSC SSCC and BCC-HOSC (when activated) shall provide GSFC FDF, as required ISS, ATV HTV, and Soyuz state vectors. The ATV and HTV state vectors shall be provided by the ATV and HTV Control Centers, respectively, to the SSCC. State Vector formats are specified in JSC/GSFC Operational Communications ICD for MCC Systems (JSC 11534, Vol. 1, latest revision). Vectors will be transmitted between FDF and SSCC via ISSOnet. Acquisition Data will be generated by the GSFC FDF, using the received state vector(s) or a FDF Orbit Determination vector."
- C. Ms. Ramirez reviewed proposed changes to the SpaceX and Orbital PRD Annexes.
1. Ms. Ramirez stated that FDF is requesting to add a requirement that SpaceX and Orbital clarify OD expectations of GSFC FDF during the L-18 Month to L-1 Month timeframe.
 2. Ms. Ramirez stated that the requirement for MCC-X and MCC-D to provide GSFC FDF with trajectory data at L-90 days seems unrealistic. The requirement should be changed to L-30 days.
 3. Mr. Bangerter stated that the requirement should reflect the actual need.
 4. Mr. Whitney stated that in operations, the OIP will continue to be used as the guiding document, not the PRD, until TOPO work with the customers to change this approach. He requested additional information so that he could address this item with TOPO. Mr. Bangerter requested that Ms. Ramirez provide Mr. Whitney a justification, with risks, for why the FDF needs SpaceX and Orbital trajectory data by L-30 days (**091012-FDF VV Reqt-02**). Mr. Bangerter requested that Ms. Clark provide Mr. Whitney a justification, with risks, for why the Network needs SpaceX and Orbital trajectory data by L-30 days (**091012-FDF VV Reqt-03**).
 5. Ms. Ramirez stated that the ISS State Vectors requirement should be renamed "SpaceX State Vectors and Cygnus State Vectors", and the requirement should be modified to read, "The MCC-H shall provide, as required, SpaceX/Cygnus state vectors to GSFC FDF. The Dragon/Cygnus state vectors shall be provided by the MCC-X/MCC-D to the MCC-H. The FDF also has the ability to provide orbit determination support, if required. Acquisition Data will be generated by the GSFC FDF, using the received state vector(s) or a FDF Orbit Determination vector."

ACTION ITEM REVIEW

The following action items were assigned at the September 10, 2012, HSF NSG FDF VV Requirement splinter meeting:

- 091012-FDF VV Reqt-01 Crystal Ramirez, GSFC/FDSS
Joe Whitney, JSC/GC
ACTION: 1) Provide Joe Whitney with information for the proposed request to levy a requirement on JAXA to provide trajectory data at L-18 month to L-1 month and at L-1 month to L-1, and the proposed request to have ESA and JAXA notify TOPO of OD expectations from FDF when the permission trajectory data is provided
 2) Joe Whitney to discuss FDF's proposed requests with TOPO and coordinate the requirements updates to the PRD and OIP
- 091012-FDF VV Reqt-02 Crystal Ramirez, GSFC/FDSS
ACTION: Provide Joe Whitney a justification, with risks, for why the FDF needs SpaceX and Orbital trajectory data by L-30 days
- 091012-FDF VV Reqt-03 Liz Clark, GSFC/HSF
ACTION: Provide Joe Whitney a justification, with risks, for why the Network needs SpaceX and Orbital trajectory data by L-30 days

(Original Approved By)
Crystal Ramirez
GSFC/FDF