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TO: Distribution

SUBJECT: May 15, 2001, X-38 Meeting

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I. INTRODUCTION

Mr. H. Allen convened the May 15, 2001, X-38 meeting to discuss support requirements and plans for the X-38 tests to be performed in Australia (refer to the *Australia Landing Opportunities* attachment). There are three orbit opportunities and the landing sites are in Australia. The area in Australia is sparsely populated, providing better cross-range landing sites. Orbits 65 and 66 would use the primary site (Woomera) and orbit 67 would use one of the secondary sites. The primary site will have the communications and other equipment. The plan is to load the equipment onto an aircraft and transport to the secondary sites if needed. The question was asked if there is power at the sites and Mr. Allen indicated that it is not known at this time. There are several requirements that need to be supported including the ability to switch video. Options that have been discussed include using systems such as TILT and TURFTS or building a new system.

II. V-201 LANDING SITE REQUIREMENTS

- a. Mr. R. Parise discussed V-201 landing site requirements (refer to the *V-201 Landing Site Comm* attachment). Mr. Parise stated that there is a capability that has been exercised in the past. TILT is a portable system that is available in an S- and Ku-band version. The original proposal called for using both systems. The Ku-band version runs at 10 Mb/sec and the S-band runs at 1 Mb/sec. The NASA Integrated Services Network (NISN) has a voice over IP gateway at the Marshall Space Flight Center (MSFC) that can be used. The configuration uses two laptops that provide one audio interface each. The video switching can be performed by the Dryden Flight Research Center (DFRC) communications van. The use of TURFTS is also a possibility. A question arose as to what services are required. Mr. Parise stated that he thought a forward link from the ground was required. Mr. H. Allen stated that the Ground Network (GN) mode from the ground is required. Mr. R. Villarreal stated that the STDN mode (transmit only) is also required. It was suggested that a P-3 could be used. Mr. T. Sobchak stated that the P-3 is very expensive. He stated that after October 2002 the Air Force Remote Tracking Sites (RTS) would not be available. Mr. Parise stated that if no forward link is required, then the service could be provided without using the TURFTS. A portable GN-mode receiver and transmitter would be needed. If the forward link were provided in the Ku-band TILT, then it would not be necessary to go to White Sands Complex (WSC) to point. Mr. Parise said that a rough estimate to build the system is \$150k. The forward link in the Ku-band system eliminates the need to use the S-band system. Mr. J. Aquino asked if the MSFC NISN gateway would be available. He thought that it is optimistic to believe that the gateway will be available during the time frame being discussed. The gateway was intended for remote users and not real-time Air-to-Ground (A/G). Dedicated premium service would be required. The gateway does not provide the needed mission critical reliability required.
- b. Mr. H. Allen suggested that the actual requirements be clarified again. The TILT Ku-band, MSFC gateway, and audio gateway are available and the router and mpeg decoder are at WSC already. In regards to tracking, a GN-mode system is required (receive and transmit). GSFC has such a system available as well. The TURFTS is very hard to schedule and does not seem to be required. Mr. Parise stated that it would be possible to bring an mpeg decoder to JSC and ship the 6-Mb/sec data to JSC. A question arose as to the dump rate. The rate being discussed is 2 Mb/sec. Mr. R. Villarreal stated that the rate should not be an obstacle; the hardware should be able to switch. Mr. Sobchak suggested using the Software Programmable Advanced Receiver (SPAR). These are available from GSFC. It will need to be determined if the rate is switchable on the SPARs. The question arose as to the size of the antenna needed. Mr. Parise stated that a larger antenna should be planned for, so that either rate could be supported. The telemetry will be in the CCSDS format, Reed-Solomon encoded but no convolutional encoding. Real-time and dump data will be required. The Wallops Flight Facility (WFF) TOTS could handle the requirements. It was stated that if the dump requirement were either difficult or expensive, the requirement would be reviewed and possibly deleted. Mr. Sobchak stated that it will come down to what is reasonable and what is the cost. The Universal Space Network (USN) is available but there are data delivery delays and line rate limitations. The USN sites do have the GSTDN package. Mr. Villarreal stated that he thinks the requirement is to provide the configuration as illustrated on the last page of the presentation plus S-band telemetry at the ground site and S-band commanding at the ground site.

- c. A method for acquisition of the vehicle has been suggested, using the optical trackers. The question arose as to how the optical tracker will acquire the vehicle. It was stated that the optical trackers will have predicts available. It was suggested that Mr. J. McKee be contacted for more information as to how the optical trackers operate. Mr. R. Parise stated that a comparison can be made between the navigation data from the vehicle and the predicts. The TDRS pointing data will be supported by the Space Shuttle. Auto tracking was suggested, but the cost would have to be investigated.
- d. A discussion arose pertaining to the acquisition of the frequency license. Mr. Sobchak stated that GSFC will not acquire the license. GSFC is providing support to the X-38 program and the program would have to acquire the license. Mr. Villarreal stated that the owner of the equipment should get the license. Mr. Sobchak stated that GSFC would provide the necessary information, but that the program would have to acquire the license. The program needs to be aware that when there is **TBD** reversing near a Deep Space Network (DSN) site, the frequency license could be an issue.

III. ACTION ITEM REVIEW

No formal action items were assigned at this meeting.