**Jet Propulsion Laboratory** **INTEROFFICE MEMORANDUM**

930-XX-0XXX-AEA/ESB: lc

September 16, 2003

**TO:** J. A. Wackley

**FROM:** E. S. Burke

**SUBJECT:** Minutes for the DSS-46 Downtime Readiness Review (DTRR) held on September 16, 2003.

## DSS-46 Downtime Readiness Review

The DSS-46 Downtime Readiness Review (DTRR) was held on September 16, 2003 at JPL in building 303-411 with Canberra staff participating via teleconference link. Mr. Tim LeMesurier presented the Heating Ventilation and Air Condition Replacement (HVAC) task materials. The DTRR was conducted to review and assess the readiness for all activities planned for the HVAC replacement task at DSS-46 scheduled to begin October 6, 2003.

## Review Board

Gene Burke, Chairman.....DSMS Operations
Jim Buckley, for Allen Berman .....DSMS Operations
Ken Kimball.....DSMS Plans and Commitments
Dennis Buck.....DSMS Operations (Maintenance)
Bob McMahon .....CSOC Engineering
Len Ricardo.....CDSCC Operations

## Attendees

Andujo, Art
Buck, Dennis
Buckley, Jim
Burke, Gene
Hatef, Ramin
Ho, Alan
Kimball, Ken
LeMesurier, Tim
McMahon, Bob
Ricardo, Len
Steltzmuller, Peter

**Introduction** – *G. Burke*

Mr. Burke introduced the Downtime Readiness Review Board and reviewed the Downtime readiness review process definition.

**DSS-46 Heating Ventilation and Air Conditioning Replacement Review**: - *T. LeMesurier*

- **Task Summary**
- **Task Status**
- **Success Criteria Checklist**

***Task Summary –*** The objectives of the downtime are to upgrade the Heating Ventilation and Air Conditioning system of the DSS-46 antenna by installing a new chilled water system, redundant air handling system, electrical reticulation system, and a modernized management and control system. At this time the current system is very difficult to maintain and is nearing a point where it will no longer be able to be maintained. Therefore it is important that this task be completed before the Asset Contention Period (ACP) begins. The upgrade will fully modernize the HVAC system and as a result will also become compatible with the HVAC systems at other antennas at CDSCC, thus making spares compatibility and management simpler. The upgrade will also provide an integrated electronic management and control system controllable from the complex.

***Task Status –*** A detailed schedule has not been developed but will be created and sent to the Downtime Readiness Review Board for review. Tim LeMesurier will distribute the schedule as an action of this review. However a detailed work scheduled has been delivered to contractors outlining work to be completed.

Tools and personnel have been scheduled to be available during the upgrade. All necessary hardware has been procured from local manufacturers in Canberra. The bulk of the hardware is expected to be delivered on September 17, 2003 and will coincide with a crane to offload and place the equipment in its final location. All the hardware has been mostly pre-assembled and tested at the manufacturer's facility in order to provide a quicker installation process. This is a fundamental change to previous HVAC installations, but has been deemed much better method. There are other minor off-the-shelf hardware items expected to be delivered within the next week.

The preliminary design documentation has been filed with JPL through the ECR process and will require additional modifications once the upgrade has been completed. Typically the maintenance manuals and updated drawings are provided after the installation. The type of equipment being installed is very similar in functionality and design to the equipment at the other antennas at Canberra, therefore it is assumed that repair and spares will not be a problem for the current maintenance staff.

The management and control software is a proven off-the-shelf software that has been customized for this particular use, and is very similar to existing HVAC control software being used at DSS-45, and therefore will require little or no training for operations personnel. It is planned to follow the antenna maintenance plan requirements to maintain an archive copy of the software and database for disaster recovery. The software is expected to be delivered by September 26, 2003.

A mock-up test will be performed by CDSCC personnel with the manufacturer about two

weeks before the system goes into operations. The test will simulate operational conditions that the system will operate under, in order to determine its functionality and test that transducers and valves are working properly, as well as to uncover and work out any unforeseen problems. Any outstanding issues can be addressed during regularly scheduled maintenance periods if necessary.

As an action item, Mr. LeMesurier will provide the Review Board updates to hardware and software delivery status as well as work progress until the completion of all upgrades.

Note: During the preparation of these minutes Mr. LeMesurier, acknowledged receipt of all hardware in good order. At this time there are no outstanding hardware issues and the downtime should proceed as scheduled. The software delivery is still pending, and is expected September 26, 2003.

***Success Criteria Checklist*:**
At this time there are several major outstanding issues with hardware being onsite, but delivery of all hardware should be completed within a week as planned, therefore it is being recommended to the board to proceed with the task:

- The task manager believes that the work schedule is credible. Contingencies are in place if the task is unable to be completed due to weather or hardware problems within the downtime period. Facility personnel are confident that any outstanding issues can be completed during subsequent maintenance periods. All maintenance personnel are trained and capable of maintaining the new equipment.
- Most all hardware will be onsite well in advance of the downtime and much of the minor work not involving the antenna can be completed before the downtime begins. It is believed that remaining hardware will arrive on schedule.
- A safety plan has been received from the prime contractor and a joint risk assessment has been completed. There are safety and work organization meetings planned for each morning of the downtime.
- Hardware transfer agreements have not been initiated. The transfer forms will be initiated by Tim LeMesurier and status will be provided to the review board on their progress.
- Spares hardware is already available and onsite as the new system is compatible with existing systems at other antennas. But the spares inventory will be adjusted as needed after the equipment has been in service.
- Supporting personnel, tools and equipment required will be available for these tasks.
- There are no known anomalies in the system. The new system design is based on the design of other antenna HVAC systems; therefore it is felt that it is a proven system.

Traditionally there has been no requirement for centrally managing HVAC software, as it has not been capable of impacting the functionality of an entire system as it can now. The software has become an integral and dynamic component to the operations of the overall system, which should probably fall under the same requirements as other DSN software and therefore be managed by JPL software management. Mr. Kimball feels that this is an issue that requires looking into in another forum.

Mr. LeMesurier discussed the schedule and explained the different aspects involved in the upgrade. The work has been broken down into several sections of the antenna. As noted in the success criteria much of the minor work is scheduled to be completed prior to and after the Downtime period. The work has been further divided into portions to be completed by the contractor and the facility personnel. Most lifting, rigging and specialized work involving the antenna structure will be completed by the station personnel and other work, such as plumbing, electrical and controls work are to be completed by the contractor.

**Board Summary:**

The Board reviewed each of the success criteria following the presentation and recommended that DSS-46 begin its downtime as planned. Comments provided by each of the board members are as follows:

*Len Ricardo* – Mr. Ricardo agreed to proceed with the downtime at DSS-46, and sees no issues that would prevent the downtime from succeeding.

*Dennis Buck* – Mr. Buck agreed to proceed with the downtime at DSS-46. The contingency plan to complete work during the following maintenance days if necessary seems a viable solution. Mr. Buck is confident that all work will be completed prior to the ACP.

*Bob McMahon* – Mr. McMahon agreed to proceed with the downtime at DSS-46. Mr. McMahon would like to have seen a more detailed schedule of the work to be complete, but has confidence in Mr. LeMesurier's plan. Mr. McMahon would like to be kept apprised of the equipment delivery status.

*Ken Kimball* – Mr. Kimball agreed to proceed with the downtime at DSS-46, however, Mr. Kimball would like Mr. LeMesurier follow up on the Transfer Agreements and identify any liens as soon as possible.

*Jim Buckley* – Mr. Buckley was not able to provide closing comments, but was contacted later and agreed that the DSS-46 HVAC task should proceed as scheduled.

*Gene Burke* – Mr. Burke agreed to proceed with the downtime at DSS-46, but would like to have the outstanding issues taken care of as soon as possible.

**Action Items (AI's):**

1. Tim LeMesurier will provide the Review Board updates to hardware and software delivery status as well as work progress until the completion of all upgrades.
2. The hardware transfer agreement forms will be initiated by Tim LeMesurier and status will be provided to the review board on their progress.