INSTRUMENT OR SUBSYSTEM: SA3 Drive Mechanism Performance

REQUIREMENT:
J10.4.14.1.1 “Verify that SA3 Drive Mechanism is performing nominally and that the sensed positions are within +/- 3.5 degrees of the commanded position when operating within the range of 0 to 130 degrees and +/- 5.0 degrees if operating outside this range. The maximum command profile error during the solar array slews will also be verified to be less than the safemode test threshold of 10 degrees for 3 seconds.”

RELEVANT SMOV PROPOSAL:
NONE

DESCRIPTION OF METHODS:
Performed data extractions following SA3 installation to determine if sensed positions were within the expected range of the commanded positions.

DESCRIPTION OF RESULTS:
All slews performed within their expected ranges. Results summarized on following chart.

REQUIREMENT STATUS: SATISFIED

SUPPORTING DOCUMENTATION: NONE
DESCRIPTION OF RESULTS (Cont’d):

SA3 Slew performance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requirement</th>
<th>SA3 Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Position Error</td>
<td>+/- 3.5 Degrees from Commanded Position</td>
<td>+SA3 Average = 1.027 Degrees</td>
</tr>
<tr>
<td>(35 Samples)</td>
<td></td>
<td>-SA3 Average = 0.837 Degrees</td>
</tr>
<tr>
<td>SA Profile Error</td>
<td>&lt; 10 Degrees</td>
<td>+SA3 Average = 3.122 Degrees</td>
</tr>
<tr>
<td>(20 samples)</td>
<td></td>
<td>-SA3 Average = 2.756 Degrees</td>
</tr>
</tbody>
</table>
INSTRUMENT OR SUBSYSTEM: SA3 Power System Performance

REQUIREMENT:

J10.4.14.1.2 “Verify that SA3 will provide sufficient power to support HST’s load range. Power performance will be assessed and compared to beginning of life predicts that account for expected degradation.”

RELEVANT SMOV PROPOSAL:
NONE

DESCRIPTION OF METHODS:

Power measurements will be calculated when HST is at orbit noon, when the sun vector is within +/-10 degrees of the –V1 axis, when the solar array to sun incidence angle is less than 5 degrees and when all CCC K-relays and SPA Trim Relays are closed.

DESCRIPTION OF RESULTS:

HST power performance has exceeded BOL predictions. Results shown on following graph, ‘SA-3 Actual and Predicted Total Output’.

REQUIREMENT STATUS: SATISFIED

SUPPORTING DOCUMENTATION: NONE
Electrical Power Subsystem

SA-3 ACTUAL AND PREDICTED TOTAL POWER OUTPUT
(Feb. 2002 through July, 2002)
34.97V, 0° Incidence Angle
INSTRUMENT OR SUBSYSTEM: PCU-R Performance

REQUIREMENT:
J10.4.14.2.1 “Verify that PCU-R will support HST’s charging.”

RELEVANT SMOV PROPOSAL:
NONE

DESCRIPTION OF METHODS:
PCU-R performance will be validated by verifying battery voltages are within expected values. Bus voltages, Bus impedance, load currents and structure currents will also be monitored to ensure correct power performance. Verify SA output and SPA Trim Relay and CCC-K Relay operation via status telemetry and current flow.

DESCRIPTION OF RESULTS:
Battery voltages; battery, solar array, load and structure currents are verified as nominal. Minor adjustments have been identified as necessary for the bus voltages. Database calibration changes will be included in the next operational database build. PCU-R performance is nominal. CCC-K Relays and SPA Trim Relays are opening as expected. Battery Impedance is negligible. View following graphs.

REQUIREMENT STATUS: SATISFIED

SUPPORTING DOCUMENTATION: NONE
Electrical Power Subsystem

CCCK Relay Openings Since SM3B
March 6, 2002 - August 8, 2002

Figure 1

No. of cycles

0 50 100 150 200 250

K Relay

GCO1, GCO2, GCO3, GCO4, GCO5, GCO6, GCO7, GCO8, GCO9, GCO10, GCO11, GCO12

Relay

Figure 1

6
Electrical Power Subsystem

Trim Relay Openings Since SM3B
March 6, 2002 - August 8, 2002
Electrical Power Subsystem