INSTRUMENT OR SUBSYSTEM: NCS

REQUIREMENT:
J.10.4.4.5.1 “Configure the NCS to recool NICMOS detectors. The goal during SMOV is to verify the capability to maintain the NICMOS Cooling Coil temperature less than or equal to 69 +/- 0.1K.”

RELEVANT SMOV PROPOSAL: N/A

DESCRIPTION OF METHODS:
On day 2002:078 the NCC was started and on day 2002:101 the NCC reached its weighted Neon setpoint of 70K and began to control. On day 2002:109 NICMOS was brought into Operate mode.

DESCRIPTION OF RESULTS:
The NICMOS Cooling Coil (NDWTMP16) achieved an average temperature of 70.5K on day 2002:111.

REQUIREMENT STATUS: The temperature of 70.5 K was accepted by the Science Institute as cold enough due to optimal temperatures needed at the detector. Though the cooler appeared to have more capacity the capacity was not explored.

SUPPORTING DOCUMENTATION: N/A
INSTRUMENT OR SUBSYSTEM: NCS

REQUIREMENT:
J.10.4.4.5.2 “Verify the capability of the NCS to achieve a NICMOS Cold Well temperature of 75 +/- 3 degrees Kelvin and maintain it within 0.1 K.”

RELEVANT SMOV PROPOSAL: N/A

DESCRIPTION OF METHODS:
On day 2002:078 the NCC was started and on day 2002:101 the NCC reached its weighted Neon setpoint of 70K and began to control. On day 2002:109 NICMOS was brought into Operate mode.

DESCRIPTION OF RESULTS:
Between days 109 and 112 the NCS was able to maintain a cold well (NDWPMP14) temperature between 73.7K and 73.8K. After a final temperature setpoint was selected (between days 131 and 225) the cold well has maintained its temperature between 75.9K and 76.1K which is within 0.1K of 76K.

REQUIREMENT STATUS: Satisfied

SUPPORTING DOCUMENTATION: N/A
INSTRUMENT OR SUBSYSTEM: NCS

REQUIREMENT:
J.10.4.4.5.3 “Verify the NCS capability to provide adequate level of thermal stability and repeatability for NICMOS science operations. Minimum acceptable levels of performance are thermal stability at the detector baseplate of +/- 0.1 K over one hour and +/- 0.5 K over one month.”

RELEVANT SMOV PROPOSAL: N/A

DESCRIPTION OF METHODS:
In order to test repeatability the NCC control point was brought to 72K on day 116, to 72.5K on day 120, 71.5K on day 122 and back to 72K on day 124. Thermal stability can be seen during the 95 days of operation since a final setpoint was chosen (days 131 through 225).

DESCRIPTION OF RESULTS:
The results of the stability tests show that the NCC Control Point (MNCONTRL) returned to 72K after being brought to several intermediate setpoints. Thermal stability shows that the detector baseplate (NDWTMP11) has maintained a temperature between 76.9K and 77.2K for the 95 days since NCC final setpoint. There has been an orbital variation in temperature of around 0.05K and a monthly variation of 0.3K.

REQUIREMENT STATUS: Satisfied

SUPPORTING DOCUMENTATION: Report on NCS Temperature Stability and Control Law, Rodger Thompson, University of Arizona
NCS Repeatability on MNCONTRL

C. Cottingham
September 30, 2002
INSTRUMENT OR SUBSYSTEM: NCS

REQUIREMENT:
J.10.4.4.6.1 “The temperatures of each NICMOS detector, along with its range of variation and the timescales for variation, shall be determined. Detector temperature stability shall be characterized over periods of 60 sec, 2000 sec, 24 hours, and 30 days.”

RELEVANT SMOV PROPOSAL: N/A

DESCRIPTION OF METHODS: By inspection of data the stability can be determined on NDWTMP11.

DESCRIPTION OF RESULTS: The sixty second variation is about 0.05K. The 2000 second variation is about 0.05K. The daily peak to peak variations are approximately 0.1K. The thirty day peak to peak variation is approximately 0.3K. The following plots illustrate these trends, but multiple time sets were reviewed.

REQUIREMENT STATUS: Satisfied

SUPPORTING DOCUMENTATION: N/A
NDWTMP11 30 minute and 60 second Variation

C. Cottingham
September 30, 2002
NDWTMP11 Monthly Variation

C. Cottingham
September 30, 2002
INSTRUMENT OR SUBSYSTEM: NCS

REQUIREMENT:
J.10.4.4.6.2 “The temperature of the VCS (and hence the filter elements), along with its range of variation and the timescales for variation, shall be determined. The thermal stability of the VCS shall be determined to be within +/- 5K of the nominal operating temperature as determined by models of NCS performance.”

RELEVANT SMOV PROPOSAL: N/A

DESCRIPTION OF METHODS: The following data extraction shows that the VCS temperatures (NDWTMP2X) over the last 50 days (days 281 through 230).

DESCRIPTION OF RESULTS: The temperatures average approximately 112K. The maximum temperature seen over the past 50 days is 113.0K and the minimum temperature is 111.5K. The predicted temperature was 118K.

REQUIREMENT STATUS: Satisfied. The VCS is running 6K cooler than the model predicted, but this should not be an issue.

SUPPORTING DOCUMENTATION: N/A