ACIS Verification Summary Report

Specification:	AXAF Observatory to Science Instrument ICD (IF1-20)
Requirement Number/Title:	3.3.1.1.1.5.3 ACIS PSMC Thermal Interfaces (VRSD 3.3.1.1.1.5.3)

Requirement Statement: For PSMC hot and cold case analysis the boundry temps and surface IR emittances of the ISIM shall be per Figure 3.3-2.

Verification Method:	Analysis

Procedure Number: N/A

Configuration:

ACIS Instrument Mounted in ISIM

Cycle Time: N/A

Verification Discussion/Results:

The PSMC has been designed to meet the required external emittance as was verified in ACIS Verification Report 36-01520.034. It is not an ACIS responsiblity to create and maintain a ISIM integrated model with the correct temperatures and emittances on Non-ACIS hardware. There is not enough information in the ICD for the ACIS to create a model with these boundary conditions and no model has been provided to ACIS by the ISIM. It is an ISIM responsibility to maintain this model and verify that the survival and operational temperature ranges for the PSMC are within the required temperature limits specified in the ICD. All ACIS thermal analyisis was performed with the assumption that the PSMC box walls were maintained within the required temperature ranges by the ISIM thermal control system. A model of the PSMC was provided by ACIS to the ISIM contractor for inclusion in the integrated thermal model. The requirements of paragraph 3.3.1.1.1.5.3 will have to be verified by the ISIM contractor.

ACIS Cognizant Engineer   Date

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Verification Method:	Analysis

Procedure Number: N/A

Configuration:

ACIS Instrument Mounted in ISIM

Cycle Time: N/A

Verification Discussion/Results:

This is the second submittal for verification of this requirement and the answer is the same. To complete the analysis, the ISIM contractor must provide both the TRASYS and SINDA models or an equivalent conduction and radiation sink for each sidewall of the PSMC. Currently, the required dimensional information to construct TRASYS models does not exist in the ICD. The ACIS responsiblity to provide the required external surface emittance and thermal strap mounting interfaces for the PSMC has been met and verified in other reports. Models of the PSMC were also provided to the ISIM contractor for verification purposes. Preliminary models were created by ACIS of the PSMC in the ISIM to confirm ISIM predictions. However, it is not the ACIS responsibility to formally verify the ISIM models. Analysis uncertainty margin of 11°C and test margins of 5°C were added to the ICD specified wall temperatures to account for any errors in the ISIM models. All internal component thermal analysis was performed with ALL box walls held at +46°C (hot case operating) and -36°C (cold case case operating). Testing was also performed at these temperature limits. This is a conservative analysis and test since the max and min temperatures specified in the ICD are for the worst case wall temperature. Therefore, as far as ACIS is concerned the requirements of paragraph 3.3.1.1.1.5.3 have been met with a conservative analysis.

Additional Note: I don't believe any other contractors have been asked to verify the ISIM thermal models (i.e. RCTU, Fid Lights, ISIM mechanism motors and components, Translation Table and Turtle Shell etc). It is the reponsibility of the integrator to control the temperatures of the components inside using survival and trim heaters and by specifying mounting interfaces and surface properties.

ACIS Cognizant Engineer   6/19/97

Date