INTERFACE CONTROL DOCUMENT TITLE AND APPROVAL PAGE

(Page 1)

ICD Number: ICD-123-400 -0002 Vacuum Vessel Port Resistance Heaters	**Primary Author**: P. Goranson
Impacted WBS Elements: WBS 121, WBS 4	**Type of Interface:** Mechanical/Envelope Interface

Description of Interface:

The Vacuum Vessel (VV) utilizes inner and outer port extensions which project through the Modular Coil (MC) shell structure and the Cryostat wall. The port extension walls within the cryostat are electrically heated by resistance heaters which are attached to the port walls and are covered by the port insulation wrap. This ICD defines the rquirements for the heaters and defines the WBS interfaces. The outer port extensions are not within the scope of this document.

Record of Revisions

Revision Number	Description	Date
0	Initial Issue	12/7/2004

Approvals

WBS Manager:	**WBS Manager:**
Project Engineer:	**Project Engineer:**
Systems Engineering Support Manager:	

ICD DETAIL SHEET

(Page 2)

(Use Continuation Sheets as Necessary to Include the Following Applicable Information)

Scope of Interface:
This interface impacts the design and fabrication of the inner VV port extensions, and power input to the Core system.

Equipment and Responsibility List:
Vacuum Vessel Systems (WBS 121): Goranson
Electrical Power Systems (WBS 4): Ramakrishnan

Related ICDs:

Notes and Abbreviations:

Interface Block Diagrams:

Installation Information:
Each of the inner port extensions is provided with a minimum of one primary and one redundant (backup) electrical resistance heater tape mounted to their surface. The vertical ports (port 12) and large non-circular ports (port 4) will be provided with multiple heaters due to their large area. It is expected that there will be a minimum of at least two sets per these ports (i.e., one primary and one redundant (backup)), but the exact number is TBD until the design progresses further. The interfacing electrical system must be capable of upgrade to provide power to a similar system of heaters on the outer extensions, even though they are not utilized in initial operation. The heaters must be electrically isolated from the VV and its structure. WBS 121 is responsible for the design of the inner port extension heaters and their mounting provisions. WBS 4 is responsible for hookup to the heaters and routing power to them. The hookup interface shall be located outside of the MC structure, at the inner port extension flange.

Each heater must be capable of continuous variable operation from zero output to a maximum of 200 watts. The expected nominal operating level is 50-60 watts. The heaters must be capable of continuous operation at 350 C.

Other Pertinent Information:

Reference Documents
NCSX Vacuum Vessel Heat Balance Analysis NCSX-CALC-123-03-00.