

**INTERFACE CONTROL DOCUMENT TITLE AND APPROVAL PAGE**

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**ICD Number:** ICD-121-3-0001 Vacuum  
Vessel Diagnostic Port Allocation and Orientation

**Primary Author:** P. Gorason

**Impacted WBS Elements:** WBS 3, WBS 12

**Type of Interface:** Functional

**Description of Interface:**  
Material and port loading

**Record of Revisions**

<b>Revision Number</b>	<b>Description</b>	<b>Date</b>
0	Initial Issue	February 10, 2005
1	Add requirement for port loading.	May24, 2006

**Approvals**

<b>WBS Manager:</b>	<b>WBS Manager:</b>
<b>Project Engineer:</b>	<b>Project Engineer:</b>
<b>Systems Engineering Support Manager:</b>	

## **ICD DETAIL SHEET**

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

### **Scope of Interface:**

This interface impacts WBS 3

### **Equipment and Responsibility List:**

Vacuum Vessel Systems (WBS 12): Goranson

NCSX Diagnostics (WBS 3): Johnso

### **Related ICDs:**

### **Notes and Abbreviations:**

### **Interface Block Diagrams:**

### **Installation Information:**

A map of the VVSA ports showing identification and location of each port is shown in drawing GHJ200-001, sheets 1-3. A draft copy of this document is in Interlink. The allocation of diagnostics to these ports is the responsibility of WBS 3.

The port flange interface will operate at a temperature of 150 C during bakeout of the VV system.

The inner Port Extensions are constructed of Inconel and weld into stainless steel flanges. The only exception to this is the NB Port, which will be constructed entirely of Inconel. The outer Port extensions will be constructed entirely of stainless steel.

The maximum dead load permitted on the ports is documented in NCSX-CALC-12-007-00-d, Vacuum Vessel Structural Analysis and in the chart on this document.

The design basis for the maximum dead load (in addition to the cover flanges) on Port 2 and Ports 5 through 18 is ten times the weight of a flange and blank off flange, or 200 lbs, which ever is smaller. The load is assumed to be applied at the end of the outer port extension. Ports 4, 12, and the NB Ports are capable of larger loads but analysis has only been performed at an applied load of 250 pounds. Increasing the load above 250 pounds will require evaluation on a case by case basis, as requested by WBS 3.

### **Maximum VV dead load:**

Note that while these are the maximum loads permitted on each port, all ports may not necessarily be loaded to their maximum; the gross dead load permitted to be supported on the VV in addition to its core structural components must not exceed 20400 lbs. This includes internal upgrade PFC components, heating and cooling, insulation, and diagnostics. The rationale for this loading is based on safety factor calculations derived in DAC NCSX-CALC-12-004, Vacuum Vessel Support Rod Analysis.

**ICD DETAIL SHEET**

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

**Other Pertinent Information:**

**Port Maximum loads.**

**Dead load is assumed to be at the port flange of the outer port extension.**

<b>Port Number</b>	<b>Port Diameter</b>	<b>Flange Size</b>	<b>Max Dead Load</b>
NB	NA	NA	250
PORT 12A/12B	NA	NA	250
PORT 4A/BB	NA	NA	250
PORT 2A/2B	3.5	6	90
PORT 5A/5B	6	8	175
PORT 6A/6B	10	12	200
PORT 7A/7B	8	10	200
PORT 8A/8B	3.5	6	90
PORT 9A/9B	6	8	175
PORT 10A/10B	10	12	200
PORT 11A/11B	2.5	4.63	60
PORT 15A/15B	3.5	6	90
DOME A/B PORT17 and 18	3.5	6	90
SPACER PORT	3.5	6	90