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REMOVAL OF 2.5 AND 6 INCH VATTERFLY VALVES

GPB SCIENCE MISSION PROCEDURE P0665

29 February 2000

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1 SCOPE

This document provides procedures for the removal of the 2.5 in and 6 in Vatterfly Valves.

1.1 Acronyms

The following acronyms may be used in this document

6	TD	Test Director
7	Pr-C	Probe C, the Science Mission flight probe
8	QA	Quality Assurance

2. REFERENCES

2.1 Plans and Procedures

P0059	GPB Contamination Control Plan
P0057	Stanford Magnetic Control Plan

2.2 Drawings

1C34355	Probe to SU External Interfaces (rev. B)
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2.3 Specifications

NASM33540	General Practices For Safety Wiring and Cotter Pinning
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3. GENERAL REQUIREMENTS

<p style="text-align: center;">ONR representative and QA must be notified prior to beginning this procedure</p>
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3.1 Environmental Requirements

This procedure will be conducted in the Stanford Class 10 Cleanroom in the HEPL facility.

3.1.1. Cleanliness

The Class 10 clean room where this integration takes place shall be maintained at the cleanliness levels per GPB Contamination Control Plan P0059. Certified Class 10 cloth garments shall be worn in the Class 10 clean room.

3.1.2 Particulate Contamination

All parts and tools shall be cleaned at least to the cleanliness levels of the rooms where they are used for assembly or testing. In addition, all flight parts shall be maintained at level 100 cleanliness per GP-B Contamination Control Plan (P0059). Take all necessary precautions to keep tools and handling equipment free of particulate contamination.

<p style="text-align: center;">To the maximum extent possible, personnel shall keep their bodies and garments downstream of the SIA, relative to the HEPA wall.</p>
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3.1.3. Magnetic Contamination

All work performed on the probe shall be consistent with P0057, the GP-B Magnetic Control Plan. In addition, all parts shall be maintained at level 100 cleanliness per GP-B Magnetic Control Plan, P0057. Take all necessary precautions to keep tools and handling equipment free of particulate contamination. Tools to be cleaned with Ethyl Alcohol prior to use, or when contaminated.

3.1.4. Electrostatic Discharge Control

To prevent electrostatic charge buildup on the QB/T the particle ionizer shall always be upstream of the QB/T relative to the fan wall and the PM and the QB/PM shall be grounded.

3.2 Integration and Test Personnel

3.2.1 Integration and Test Director

The Test Director (TD) shall be Robert Brumley or an alternate that he shall designate. The TD has overall responsibility for the implementation of this procedure and shall sign off the completed procedure and relevant sections within it.

3.2.2 Integration Engineers and other personnel

All engineers and technicians participating in this procedure shall work under the direction of the TD who shall determine personnel that are qualified to participate in this procedure. Participants in this procedure are expected to be R. Brumley, C. Gray, C. Warren, B. Clarke, and K. Bower with assistance from LMMS (particularly G. Reynolds).

3.3 Safety

3.3.1 Hardware Safety

Extreme care must be taken to avoid accidentally bumping or damaging the probe.

3.3.2 Maximum Number of People in Cleanroom

Under normal operating conditions, there shall be no more than 5 people in the Class 10 Cleanroom. This is to avoid violating legal make up air requirements, and to provide an efficient workspace. Exceptions must be for short periods only, and approved by the TD.

3.4 Quality Assurance

Integration shall be conducted on a formal basis to approved and released procedures. The QA program office shall be notified of the start of this procedure. A Quality Assurance Representative, designated by D. Ross shall be present during the procedure and shall review any discrepancies noted and approve their disposition. Upon completion of this procedure, the QA Program Engineer, D. Ross or designate, will certify concurrence that the effort was performed and accomplished in accordance with the prescribed instructions by signing and dating in the designated place(s) in this document. Discrepancies will be recorded in a D-log or as a DR per Quality Plan P0108.

3.5 Red-line Authority

3.5.1 Authority to red-line (make minor changes during execution) this procedure is given solely to the TD or his designate and shall be approved by the QA Representative. Additionally, approval by the Payload Technical Manager shall be required, if in the judgment of the TD or QA Representative, experiment functionality may be affected.

3.6 ESD

These parts are not sensitive to ESD.

4 REQUIRED EQUIPMENT

4.1 Tools and Miscellaneous Supplies

Tools and Miscellaneous

Ethyl alcohol

Methanol

Ultrajet filtered compresses air

BeCu Allen wrenches

BeCu snips to cut safety wire

4.2 Parts

The following parts will be available:

Table 1
Vatterfly Valve Parts List

Description	Part Number	Serial Number	Comments
2.5 in Vat Valve	3179	0005	Installed on V1 position
2.5 in Vat Valve	3179	0003	Installed on V2 position
2.5 in Vat Valve	3179	0002	Installed on V3 position
2.5 in Vat Valve	3179	0004	Installed on V4 position
6 in Vat Valve	3223	0001	Installed on -X axis of probe
6 in Vat Valve	3223	0003	Installed on -Y axis of probe

Bolts: NAS1351N4LE38 (16)
 Bolts: AV6704U8HS (32)
 Washers: AN960C416L (48)

Note: It is acceptable to use the bolts which currently mate the valves to the probe to mate the blanks that will cover V1-V4, LV1 and LV2.

5 REMOVAL OF VATTERFLY VALVES

5.1 C-Seal Warning

TAKE CARE NOT TO SCRATCH OR OTHERWISE DAMAGE C-SEAL GROOVE AND VALVE SEALING SURFACE WHILE REMOVING VALVES.

5.2 Indicate the Valves to be removed

Description	P/N	S/N	Comments	Check if To Be Removed
2.5 in Vat Valve	3179	0005	Installed on V1 position	
2.5 in Vat Valve	3179	0003	Installed on V2 position	
2.5 in Vat Valve	3179	0002	Installed on V3 position	
2.5 in Vat Valve	3179	0004	Installed on V4 position	
6 in Vat Valve	3223	0001	Installed on -X axis of probe	
6 in Vat Valve	3223	0003	Installed on -Y axis of probe	

5.3 Remove Valve Covers

If it is necessary or desired to remove covers on the valves, remove them now by loosening the appropriate screws and removing the covers and O-Rings. Be very careful not to get any particles in the valves.

Note that it is not necessary to remove the valve covers on the 2.5" VAT valves to remove them as they are bolted on from the back.

5.4 Initial Inspection

For each valve which is to be removed, record in the comments section at the end of this procedure any particles or other abnormalities observed. Take a picture.

5.5 Remove VAT Valve

If any excess grease is observed on the valve flanges, it may be gently wiped off now with a clean room cloth.

Remove the safety wiring using snips if necessary.

Remove the bolts that hold on the valve and set them aside if necessary for use in installing the blanks.

Gently remove the VAT valve and C-Seal, being very cautious not to damage any mating surface.

5.6 Storing Instructions for the VAT Valve

Place the valve in a clean room bag. Mark the bag with the part number and serial number of the valve, and make the notation "Flight Parts." Place the valves in a separate container being careful not to scratch the C-seal mating surface, and store in the class 1000 room.

Note that no inspection or additional work on the valves may be done without a procedure and travel sheet approved by QA.

5.7 Inspection of Area Beneath Valve

Perform an inspection of the area that was underneath the VAT valves, paying particular attention to look for particulate contamination. Document any contamination observed in the comments section at the end of this procedure, and take a picture.

If any particulate contamination is observed, very carefully remove the contamination. If the QA Representative feels it is appropriate, document the incident in a D-Log or Discrepancy Report.

The area which was underneath the valve must be clean before proceeding to the next step.

5.8 Mount Blank

Install the O-Ring in its groove in Probe C. Be extremely cautious not to scratch the area where the C-Seal mates.

Mount the blanking plate. It is acceptable to use the bolts and washers which were previously on the probe. It is not necessary to use a torque wrench for this operation.

If new hardware is used, then for the 6" VAT valves use 8NAS1351N4LE38 bolts and AN960C416L washers. For the 2.5" VAT valves use AV6704U8HS bolts and AN960C416L washers.

7 PROCEDURE COMPLETION

The results obtained in the performance of this procedure are acceptable:

Engineer(s) _____ Date _____

_____ Date _____

_____ Date _____

Test Director _____ Date _____

The information obtained under this assembly and test procedure is as represented and the documentation is complete and correct:

QA Representative _____ Date _____

QA Program Engineer _____ Date _____

Copy discrepancies to D-Log and open Discrepancy Reports when required.

8 DATA BASE ENTRY

The following data shall be entered into the GP-B Data Base:

- 4 Name, number and revision of this procedure
- 5 An electronic copy of this document

- 6 A copy of the “as-built” procedure with data and pictures, when completed.