Brookhaven National Laboratory/Light Sources Directorate			
Subject:	**VACUUM PROCEDURES FOR BEAMLINE X12B**		
Number: LS-OPS-0046	**Revision:** C	**Effective:** 12/08/2011	Page 1 of 4
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The following procedures must be followed when bleeding up different beam line sections and when returning these sections to operation.

I. FRONT END (PROCEDURE TO BE PERFORMED BY NSLS VACUUM GROUP ONLY)

A   Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Refer to Front End Vacuum Procedures (SLS-07.19-13-1).

B.   Return to Operation

1. Notify the Coordinator (Beeper 5824).
2. Refer to Front End Vacuum Procedures (SLS-07.19-13-1).

II. SECTION BETWEEN VALVE 1B and FRONT END, COLLIMATION MIRROR TANK,(PROCEDURE TO BE PERFORMED BY NSLS VACUUM GROUP ONLY)

A.   Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1B and the Front-End High Vacuum Valve.
3. Hook up turbo pump to this section and isolate turbo.
4. Coordinator places Yellow Tag on Valve 1B controller and the Front-End High Vacuum Valve.
5. Slowly bleed-up with boil-off N2 while Coordinator monitors the Front-End pressure.

B.   Return to Operation

1. Pump and bake to < 1.0 x 10-8 Torr.
2. Notify the Coordinator (Beeper 5824).
3. Prepare for RGA scan.*
4. Open Valve 1B provided pressure is < 2.0 x 10-9 Torr downstream of the valve.
5. Perform RGA scan.*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tag from Valve 1B controller and the Front-End High Vacuum Valve.
7. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.**

III. SECTION BETWEEN VALVE 1B and Be WINDOW 1B, SLIT TANK, (PROCEDURE TO BE PERFORMED BY NSLS VACUUM GROUP ONLY)

A.   Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1B and the Front End High Vacuum Valve.
3. Hook up turbo pump to this section and isolate turbo.
4. Coordinator places Yellow Tags on Valve 1B controller and the Front End High Vacuum Valve.
5. Slowly bleed-up with boil-off N2 while Coordinator monitors the Front-End pressure.

B. **Return to Operation**

1. Pump and bake to < 1.0 x 10-8 Torr as read on IP1 Controller.
2. Notify the Coordinator (Beeper 5824).
3. Prepare for RGA scan.*
4. Open Valve 1B provided pressure is < 2.0 x 10-9 Torr (as read on IG1), downstream of the valve.
5. Perform RGA scan.*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tags from Valve 1B and the Front End High Vacuum Valve.
7. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.**

IV. SECTION BETWEEN Be WINDOW 1B AND VALVE 2B, STRAIGHT SECTION

A. **Bleed-Up**

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 1B and downstream Valve 2B.
3. Coordinator places Yellow Tag on Valve 1B.
4. Slowly bleed-up with boil-off N2 while Coordinator monitors the pressure on IG2 or IP2 Controller.

B. **Return to Operation**

1. Pump and bake to < 8.0 x 10-8 Torr as read on IG2.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 2B and Valve 1B provided pressure is < 1.0 x 10-8 Torr upstream of valve 2B, as read on IG2.
4. If pressures are satisfactory, Coordinator removes Yellow Tag from Valve 1B.

V. SECTION BETWEEN VALVE 2B AND VALVE 3B, MONOCHROMATOR TANK

A. **Bleed-Up**

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 2B and downstream Valve 3B
3. Coordinator places Yellow Tag on Valve 2B.
4. Slowly bleed-up with boil-off N2 while Coordinator monitors the pressure on IG3.

B. **Return to Operation**

1. Pump and bake to < 8.0 x 10-8 Torr as read on IG3.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 3B provided pressure is < 8.0 x 10-8 Torr downstream of the valve as read on IG3.
4. Open upstream Valve 2B provided pressure < 8.0 x 10-8 Torr downstream of the valve as read on IG3.
5. If pressure is satisfactory, Coordinator removes Yellow Tag from Valve 2B.

VI. SECTION BETWEEN VALVE 3B and Be WINDOW 2B, MIRROR TANK and PHOTON SHUTTER

A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Close and seal Valve 3B and Valve 2B.
3. Coordinator places Yellow Tags on Valve 3B and Valve 2B Controllers.
4. Slowly bleed-up with boil-off N2 While Coordinator monitors pressure on IG4.

B. Return to Operation

1. Pump and bake to < 8.0 x 10-8 Torr as read on IG4.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 3B provided pressure is < 8.0 x 10-8 Torr downstream of the valve as read on IG4.
4. Open Valve 2B provided pressure is < 8.0 x 10-8 Torr downstream of the valve as read on IG2.
5. If pressures are satisfactory, Coordinator removes Yellow Tags from Valve 3B and Valve 2B Controllers.

* NSLS POLICY FOR RGA SCANS (24 HOUR NOTICE REQUIRED)

An RGA scan is required before returning to operation if there is a major change of hardware in the vacuum system, i.e. changing of samples, mirrors, windows, monochromator crystals or gratings, manipulators, detectors, etc., **with the following two exceptions:**

1. After UHV sample chambers have been bled up for replacing components, an RGA scan will not be required if the chamber pressure is returned to $< 2 \times 10^{-9}$ Torr and the Front End pressure remains $< 2 \times 10^{-9}$ Torr when vacuum sections upstream of the chamber are opened into the Front End.

2. If any vacuum section upstream of the bled-up section remains at a pressure of < 9×10-10 Torr as read using a hot-filament ion gauge, when the entire beamline is opened into the Front End, and the Front End pressure does not increase, no RGA is required.

** NSLS TURBO PUMP POLICY
An unprotected turbo pump is one not separated from the Front End by a beamline valve, which automatically closes in the event of a power loss or a pressure increase at the turbo pump. **No unprotected turbo pump can share a contiguous vacuum with the Front End.**

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Document Review Frequency	
3	Years

Review signatures on file
with master copy of
controlled document

LIGHT SOURCES DIRECTORATE REVISION LOG		
Document Number:	LS-OPS-0046	
Subject:	**VACUUM PROCEDURES FOR BEAMLINE X12B**	
Rev	**Description**	**Date**
A	Original document	
B	Significant changes to beamline configuration	04/17/2002
C	Changed prepared by: & approved by to J.P. Hu	12/08/2011

BEAM
STOP

BS-6

VAT
VALVE
3B

BS-5

VAT
VALVE
2B

VAT
VALVE
1B

BS-4

BS-3

BS-2

BS-1
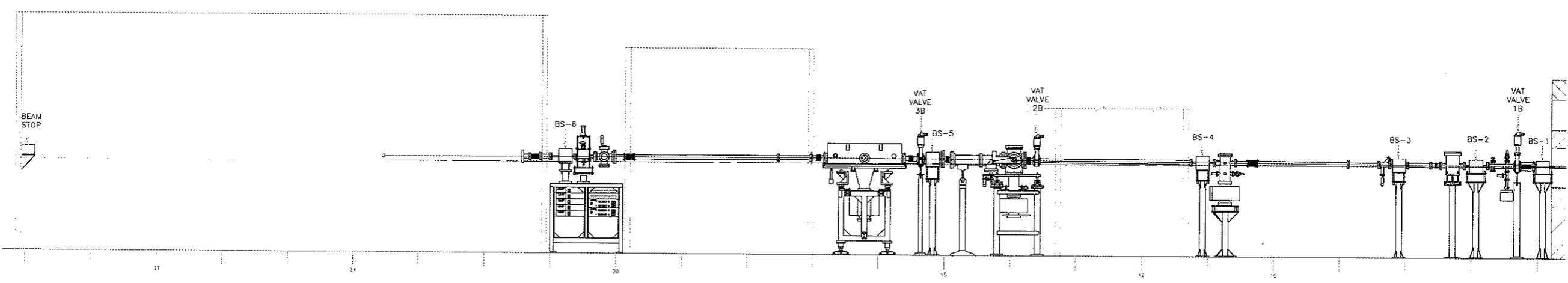
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Document Subject/Title	Document No.	Revision
VACUUM PROCEDURES FOR BEAMLINE X12B	LS-OPS-0046	C

Is this Document Safety Significant?	Yes ☐ No ☒

APPROVALS

Name (Print)	Signature	Date
J.P Hu, Preparer		12/08/2011
J. Klug, Reviewer		12/08/2011
J.P Hu, Approver		12/08/2011
S. Ehrlich, Approver		12/08/2011

Comments:

Safety Review
(Required if Document is Safety Significant)

Name (Print)	Signature	Date