Brookhaven National Laboratory/LIGHT SOURCES DIRECTORATE				
Subject:	**VACUUM PROCEDURES FOR BEAMLINE U-11**			
Number: LS-OPS-0123	**Revision:** B	**Effective:** 01/04/2010		**Page** 1 **of** 3

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The following procedures must be followed when bleeding up different sections and when returning these sections to operation (refer to Beamline Layout Drawing):

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 V1 AND VALVE V2, MONOCHROMATOR

A. Bleed-Up
1. Notify the Coordinator (Beeper 5824)
2. Turn **OFF** ionization gauge 1.
3. Close and seal Front End GP Valve, Valve V1 (Monochromator FE Isolation Valve) and Isolation Valve V2.
4. Hook up turbo pump to the Monochromator.
5. Coordinator places Yellow Tag on Valve 1 and Front End GP Valve Controller.
6. Slowly bleed-up with boil-off N_2 while Coordinator monitors Front End pressure.

B. Return to Operation
1. Bake and pump to $< 2 \times 10^{-9}$ Torr.
2. Notify the Coordinator (Beeper 5824)
3. Prepare for RGA scan.*
4. Open Valve V1 into the Front End provided pressure $< 2 \times 10^{-9}$ 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(s) from Valve V1 and Front End GP Valve Controller.
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 V2 AND VALVE V3A OR V3B (NOTE: Valve V3A is a Pyrex window valve and Valve V3B is a LiF window valve (transmits photons with $\lambda > 1050$ Å. Since no pumping exists between Valves V3A and V3B, it is required that only one of these valves be closed at any given time to provide both upstream and downstream pumping)

A. Bleed-Up
1. Notify the Coordinator (Beeper 5824)
2. Turn **OFF** ionization gauge 2.
3. Close and seal Valve V1 and Valve V2. Either Valve V3A or Valve V3B should be closed, but not both V3A and V3B.
4. Coordinator places Yellow Tags on Valve V2 and Valve V1.
5. Slowly bleed-up with boil-off N_2 while Coordinator monitors pressure between Valve V1 and Valve V2 on ionization gauge 1.

B. Return to Operation
1. Bake and pump to $< 5 \times 10^{-9}$ Torr.
2. Notify the Coordinator (Beeper 5824)
3. Prepare for RGA scan.*
4. Open Valve V2 provided pressure $< 5 \times 10^{-9}$ Torr downstream of this valve.
5. Open Valve V1 provided that the Monochromator pressure, as read by ionization gauge 1, $< 2 \times 10^{-9}$ Torr.

6. Perform RGA scan.*
7. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tags from Valve V2 and Valve V1.
8. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.**

IV. EXPERIMENTAL CHAMBER

A. Total Bleed-Up (Note: The following procedures should be followed only if beamline is currently operating in *Windowless Operation* (when both Valve V3A and Valve V3B are open).

1. Notify the Coordinator (Beeper 5824)
2. Close and seal Valve V2 and either, but not both, Valve V3A or Valve V3B.
3. Hook up turbo pump to this section.
4. Coordinator places Yellow Tags on Valve V2 and ValveV3A/B.
5. Slowly bleed up with boil-off N_2 while Coordinator monitors pressure in the section between Valves V2 and Valve V3A/B.

B. Return to *Windowless Operation* (Note: When operating windowless, with the monochromator exit slit in place, Beamline U-11 is a differentially pumped beamline in which the pressure in the experimental chamber can be as high as 1×10^{-6} Torr, but must at all times be low enough that the pressure read by ionization gauge #2 (between Valves V2 and V3A/B $< 5 \times 10^{-9}$ Torr).

1. Pump chamber to $< 1 \times 10^{-6}$ Torr if exit slit is in place **or** $< 5 \times 10^{-9}$ Torr if the exit slit is not used.
2. Notify the Coordinator (Beeper 5824)
3. Prepare for RGA scan.*
4. Open Valve V3A/B (only Valve V3A or V3B should be closed, but **not** both) while Coordinator monitors pressure between Valves V3A/B and V2 on ionization gauge #2.
5. Remove Yellow Tag from Valve V3A/B.
6. Open Valve V2 provided pressure $< 5 \times 10^{-9}$ Torr downstream of the valve (ionization gauge #2).
7. Perform RGA scan.*
8. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tag from Valve V2.
9. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.**

C. Return to *Windowed Operation*
1. Leave Yellow Tag on Valve V3A or Valve V3B, one of which, but **not** both, remains closed.
2. Notify the Coordinator (Beeper 5824)
3. Open Valve V2 provided pressure between Valve sV2 and V3A/B, as read by ionization gauge #2 $< 5 \times 10^{-9}$ Torr.
4. Coordinator removes Yellow Tag from Valve V2 provided that the Front-End pressure remains $< 2 \times 10^{-9}$ Torr.

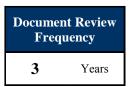## * NSLS POLICY FOR RGA SCANS (24 HOUR NOTICE REQUIRED)

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 $< 9 \times 10^{-10}$ 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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3   Years

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