

Brookhaven National Laboratory National Synchrotron Light Source		Number: LS-OPS-0062	Revision: B
		Effective: February 20, 2003	Page 1 of 3
Subject: VACUUM PROCEDURES FOR BEAMLINE X-19A			
Prepared By: W. Caliebe	Reviewed By: J. Klug	Approved By: S. Ehrlich	Approved By: C. Foerster

*Document must contain approved signatures for validity.

The following procedures must be followed when bleeding up different beam line sections and when returning these sections to operation (refer to X19A Beam Line Layout Drawing SLS-96.69-001):

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 1A and Valve 2A (Collimating Mirror Tank)

A. Bleed-up

1. Notify the Coordinator (beeper 3456 – 5824).
2. Close Valve 1A .
3. Coordinator closes Front End High Vacuum Valve.
4. Close additional valves as required to prevent unwanted bleed-up of other portions of the beamline.
5. Coordinator disables front end fast valve sensor.
6. Hook up turbo-pump to this section (Mirror Tank 1).
7. Coordinator places yellow tag on Valve 1A and the Front End High Vacuum Valve.
8. Slowly bleed up with dry nitrogen while Coordinator monitors front end pressure.

B. Return to Operation

1. Pump to less than 2×10^{-9} Torr; **DO NOT BAKE IF MIRROR IS INSTALLED!!**
2. Notify the Coordinator (beeper 3456 – 5824).
3. Prepare for RGA scan.*
4. Open Valve 1A if pressure is $< 2 \times 10^{-9}$ Torr downstream of the valve.
5. Coordinator opens Front End High Vacuum Valve.
6. Perform RGA scan.*
7. If RGA scan or pressure reading (if no RGA is required) is satisfactory, Coordinator removes yellow tag from Valve 1A.
8. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.**
9. Coordinator enables front end fast valve sensor.

II. Section between Valve 2A and Valve 3A (Monochromator Tank)

A. Bleed-up

1. Notify the Coordinator (beeper 3456 – 5824).
2. Close Valve 2A and Valve 1A.

3. Close additional valves as required to prevent unwanted bleed-up of other portions of the beamline.
4. Coordinator disables front end fast valve sensor.
5. Hook up turbo pump to this section.
6. Coordinator places Yellow Tags on Valve 1A and Valve 2A.
7. Slowly bleed up with dry nitrogen while Coordinator monitors pressure upstream of Valve 2A (Mirror Tank 1).

B. Return to Operation

1. Pump to required base pressure ($<4 \times 10^{-9}$ Torr).
2. Notify the Coordinator (beeper 3456 – 5824).
3. Prepare for RGA scan.*
4. Open all in-line valves, except Valve 1A while Coordinator monitors pressure in Mirror Tank (A1). Provided pressure in Mirror Tank (A1) is $<4 \times 10^{-9}$ Torr, open Valve 1A.
5. Perform RGA scan.*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tags from Valve 2A and Valve 1A.
7. Remove any unprotected turbo pump from this section, or valve off the turbo pump and place a Yellow Tag on the valve.**
8. Coordinator enables front end fast valve sensor.

III. Section between Valve 3A and Valve 4A (Focusing Mirror Tank)

A. Bleed-up

1. Notify the Coordinator (beeper 3456 – 5824).
2. Close Valves 1A and 3A. Leave Valve 2A open.
3. Close and seal any additional valves as needed to prevent unwanted bleed-up of other portions of the beamline.
4. Hook up turbo pump to this section.
5. Coordinator places Yellow Tags on Valve 1A and Valve 3A.
6. Slowly bleed up with dry nitrogen while Coordinator monitors pressure in Monochromator Tank (A2).

B. Return to Operation

1. Pump to required base pressure (mid 10^{-9} Torr). **DO NOT BAKE IF MIRROR IS INSTALLED!!**
2. Notify the Coordinator (beeper 3456 – 5824).
3. Prepare for RGA scan.*
4. Open all in-line valves, except Valve 1A, while Coordinator monitors pressure in Monochromator Tank (A2). Provided pressure in Monochromator Tank (A2) $< 4 \times 10^{-9}$ Torr, and pressure in Mirror Tank (A1) $< 4 \times 10^{-9}$ Torr, open Valve 1A.
5. Perform RGA scan.*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tags from Valve 3A and Valve 1A.
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 Valve 4A and Be-window

A. Bleed-up

1. Notify the Coordinator (beeper 3456 – 5824).
2. Close Valves 1A and 4A.
3. Hook up turbo pump to this section.
4. Disable Be-window fast valve sensor.

5. Coordinator places Yellow Tags on Valve 1A and Valve 4A.
6. Slowly bleed up with dry nitrogen while Coordinator monitors pressure in Focusing Mirror Tank (A3).

B. Return to Operation

1. Pump to required base pressure (mid 10^{-9} Torr).
2. Notify the Coordinator (beeper 3456 – 5824).
3. Prepare for RGA scan.*
4. Open all in-line valves, except Valve 1A, while Coordinator monitors pressure in Focussing Mirror Tank (A3). Provided pressure in Monochromator Tank (A2) $< 4 \times 10^{-9}$ Torr, and pressure in Mirror Tank (A1) $< 4 \times 10^{-9}$ Torr, open Valve 1A.
5. Perform RGA scan.*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tags from Valve 4A and Valve 1A.
7. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.**
8. Enable Be-window fast valve sensor.

*** 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.**

NSLS REVISION/REVIEW LOG	
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> See NSLS Quality Control Coordinator for review signatures <

REVISION TABLE		
Rev	Description	Date
B	Initial release into controlled document system. Major modification/upgrade to beamline.	02/20/03