**Restart After Vacuum Loss**

1. Turn off electronics, (2505 Memory Interface, Spectrometer Power Supply, Glassman High voltage, Service Physics X-Ray Gun Controller, nti sputter gun controller)
2. Turn off cryo-pump compressor
3. Turn off alarm on interlock box near bottom of rack
4. Restart the Neslab circulator
5. Set all three bypass switches on interlock box (bottom of rack) up.
6. Push reset button on interlock box
7. Press reset on back of control box over XPS
8. Turn on interlock override on control box.
9. Check gate valves to see that 0, 1, 2, 5, and 6 are open and 3 and 4 are closed
10. Turn on the turbo pump and wait till vacuum is < 1 × 10-4 T
11. Turn on the cryo-pump compressor
12. Mark sure that in the little window of the cryo pump is working
13. After the cryo temperature is down below 25K (about 1 to 3 hours) close gate valves 1 and 5 (only 0, 2 and 5 are open).
14. On the interlock box set the alarm and three bypass switches to down (on)
15. Turn off interlock override.
16. Continue to next section.

**Restarting M-Probe X-Ray Gun**

1. Check vacuum system OK
2. Gates 0, 2, and 6 should be open with all others closed
3. Turn off interlock override if it is on
4. Make sure system power switch on the back is up
5. Turn on X-ray gun boxes (bottom two – Turn on Glassman high voltage and press HV on, and turn on 9603 X-ray gun spot size controller)
6. If the vacuum has gotten above 5 x 10-8Torr or system was vented:
   1. Turn "ramp" knob on spot size controller to slowest, fully clock wise (service switch in service position, up)
   2. Press "start filament" followed by "HV on" and wait for it to read 2kV - watch pressure (Filament on LED should turn on, Xfer OK LED on, Panel meter should read I FIL mode and go to 0.65 A)
   3. Set the "service" switch UP, keeping "ramp" knob on slowest setting (c.w.) and changing "stand by" to "operate" (takes 8 h, watch pressure)
7. If the vacuum did not get above 5 x 10-8 Torr:
   1. Turn "ramp" knob on spot size controller to fastest, counter clock wise (service switch up)
   2. Press "start filament" followed by "HV on" and wait for it to read 2 KV - watch pressure
   3. Set the "service" switch up and turn "ramp" knob to fastest, then press "operate" (takes 2 h, watch pressure)
8. Once 10kV reached, degas anode by starting X-ray gun on 100 micron spot and slowly increasing the spot size until largest spot does not raise pressure above 2 x 10-8 Torr
9. Turn off X-rays
10. Turn on spectrometer boxes (top 3, spectrometer power supply, flood gun, memory interface)
11. Open software, check "X-ray gun operate" in ESCA control panel
12. Switch spot size controller from "manual" to "computer"
13. Degas flood gun - check “Flood Gun” box in ESCA control panel and increase energy to 5 eV, watch pressure and wait for at least 1 hour
14. Turn down flood gun energy, uncheck flood gun box, and close ESCA control panel
15. Instrument is ready to use

**XPS maintenance schedule Kratos and MProbe**

**Every week:**

- Refill water on Affinity and Neslab circulators

- Check water level on Hawk chiller

- Check N2 level on HREELS and order new cylinders

- Replenish gloves, IPA, and KimWipe

**Every 6 months:**

- Change M-Probe pump oil (last 2013-06-10)

- Change M-Probe anode (3 3/8" Cu gasket, Al/Cu anode, 6 Au 1/8" screws PRT-6520-003) (last 2013-06-10)

- Change M-Probe Hawk chiller deionizer (Thermo Sci combined DEM/OXY cartridge D8809) and water filter (Hytrex cartridge filter PRT-6530-003) (last2013-06-10)

- Change Kratos Affinity circulator filter (Pentek filtration polydepth filter cartridge PD-1-934) (last 2013-09-25)

**Every 36 months (last 2013-02-17):**

- Check and change Kratos deionizer cartridge (84-789), or when deionizer stays on

- Change house water filter

**Every 60 months:**

- Change tip seals on Kratos (last 2013-04-19) and EELS (last 2010-07-01) scroll pumps

- Change house air filter (Motor guard M-723 filter element) (last 2010-07-01)

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