

# Cryo Target Pre Beam Checklist

Last revised 3-5-2015    **Date** \_\_\_\_\_ **time** \_\_\_\_\_

**This checklist will be performed after every restricted access to Hall A that maintenance is performed**

People checking list \_\_\_\_\_

## Left Arm

### *Spectrometers*

- \_\_\_ Correct angle \_\_\_\_\_ (not to be used for calculations)
- \_\_\_ Check spectrometer for obstructions to movement
- \_\_\_ Check Intergen bottles for correct pressure
- \_\_\_ Ensure that Intergen alarm switch is in the normal position and the green light on the front panel is on
- \_\_\_ Ensure that 14-degree stop pin is installed (if used)
- \_\_\_ Ensure that outer limit stop is installed (if used)
- \_\_\_ Minimum/Maximum angles for spectrometer from \_\_\_\_\_ Deg. To \_\_\_\_\_ Deg.

### *Vacuum*

- \_\_\_ Turbo on at turbo controller in rack # 1H71B01
- \_\_\_ Pump valves open at valve controller in rack # 1H71B01 channel #2
- \_\_\_ Convectron gages read "0" millitorr rack # 1H71B01
- \_\_\_ Cold cathode gauge in rack # 1H71B01  $< 5 \times 10^{-5}$
- \_\_\_ Actual cold cathode reading \_\_\_\_\_
  
- \_\_\_ Ensure that Q1 lead heaters in rack 1H71B08 are on and operating and at least 40 deg.  
Actual lead temperatures    left\_\_\_\_    right\_\_\_\_
  
- \_\_\_ Ensure that Q2 lead heaters in rack 1H71B07 are on and operating and at least 40 deg.  
Actual lead temperatures    left\_\_\_\_    right\_\_\_\_
  
- \_\_\_ Ensure that Q3 lead heaters in rack 1H71B08 are on and operating and at least 40 deg.  
Actual lead temperatures    left\_\_\_\_    right\_\_\_\_
  
- \_\_\_ Ensure that Dipole lead heaters in rack 1H71Q are on and operating and at least 40 deg.  
Actual lead temperatures    left\_\_\_\_    right\_\_\_\_
  
- \_\_\_ Bogie power is ON \_\_\_ off \_\_\_

## ***Power supplies***

### **Q1:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Unlock power disconnect switch and turn on AC power
- Visually check power supply for faults. Rack # 1H71B07
- When all faults have been cleared, Ensure that power supply is in remote control

### **Q2:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Ensure that all doors and panels are closed and secured
- Unlock power disconnect switch and turn on AC power
- Turn on both sets of three pole breakers located on power supply
- Visually check power supply for faults
- When all faults have been cleared, lift lever on lower right side of supply
- Ensure that power supply is in remote control

### **Q3:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Ensure that all doors and panels are closed and secured
- Unlock power disconnect switch and turn on AC power
- Turn on both sets of three pole breakers located on power supply
- Visually check power supply for faults
- When all faults have been cleared, lift lever on lower right side of supply
- Ensure that power supply is in remote control

### **Dipole:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Unlock power disconnect switch and turn on AC power
- Turn on power lever on right upper side of supply
- Visually check power supply for faults on supply and at rack #
- When all faults have been cleared, Ensure that power supply is in remote control
- Ensure Kepco power supply is on in rack # 1H71B06
- Check power supply for proper polarity positive\_\_\_ negative\_\_\_ rack # 1H71B06
- NMR gradient compensation for proper polarity positive\_\_\_ negative\_\_\_ (Dipole balcony)
  
- Ensure that the Q3 insulating vacuum pump is functioning and has sufficient oil
  
- Ensure the Q3 automatic valve is operational and open and it's the Convectron gage reads 0
  
- Ensure that spectrometer turbo backing pump is on, has sufficient oil and that the automatic valve is operational

## Right Arm

### *Spectrometers*

- \_\_\_ Correct angle \_\_\_\_\_ (not to be used for calculations)
- \_\_\_ Check spectrometer for obstructions to movement
- \_\_\_ Check Intergen bottles for correct pressure
- \_\_\_ Ensure that Intergen alarm switch is in the normal position and the green light is on on the front panel
- \_\_\_ Ensure that 14-degree stop pin is installed
- \_\_\_ Ensure that outer limit stop is installed (if used)
- \_\_\_ Minimum/maximum angles for spectrometer \_\_\_\_\_ to \_\_\_\_\_

### *Vacuum*

- \_\_\_ Turbo on at turbo controller in rack # 1H72B01
- \_\_\_ Pump valves open at valve controller in rack # 1H72B01 channel #2
- \_\_\_ Convectron gages read "0" millitorr in rack # 1H72B01
- \_\_\_ Cold cathode gauge in rack # 1H72B01  $< 5 \times 10^{-5}$
- \_\_\_ Actual cold cathode reading \_\_\_\_\_
  
- \_\_\_ Ensure that Q1 lead heaters in rack 1H72B08 are on and operating and at least 40 deg.  
Actual lead temperatures left \_\_\_\_\_ right \_\_\_\_\_
  
- \_\_\_ Ensure that Q2 lead heaters in rack 1H72B07 are on and operating and at least 40 deg.  
Actual lead temperatures left \_\_\_\_\_ right \_\_\_\_\_
  
- \_\_\_ Ensure that Q3 lead heaters in rack 1H72B08 are on and operating and at least 40 deg.  
Actual lead temperatures left \_\_\_\_\_ right \_\_\_\_\_
  
- \_\_\_ Ensure that Dipole lead heaters in rack 1H72Q are on and operating and at least 40 deg.  
Actual lead temperatures left \_\_\_\_\_ right \_\_\_\_\_
  
- \_\_\_ Bogie power is ON \_\_\_ Off \_\_\_

## ***Power supplies***

### **Q1:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Unlock power disconnect switch and turn on AC power
- Visually check power supply for faults. Rack # 1H72B06
- When all faults have been cleared, Ensure that power supply is in remote control.

### **Q2:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Ensure that all doors and panels are closed and secured
- Unlock power disconnect switch and turn on AC power
- Turn on both sets of three pole breakers located on power supply
- Visually check power supply for faults
- When all faults have been cleared, lift lever on lower right side of supply.
- Ensure that power supply is in remote control

### **Q3:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Ensure that all doors and panels are closed and secured
- Unlock power disconnect switch and turn on AC power
- Turn on both sets of three pole breakers located on power supply
- Visually check power supply for faults.
- When all faults have been cleared, lift lever on lower right side of supply.
- Ensure that power supply is in remote control

### **Dipole:**

- Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)
- Unlock power disconnect switch and turn on AC power
- Turn on power lever on right upper side of supply.
- Visually, check power supply for faults on supply and at rack #OD172Q.
- When all faults have been cleared, Ensure that power supply is in remote control.
- Ensure Kepco power supply is on in rack # 1H72B06
- Check power supply for proper polarity positive\_\_\_ negative\_\_\_ rack # 1H72B06 and on power supply
- NMR gradient compensation for proper polarity positive\_\_\_ negative\_\_\_ on dipole balcony
- Ensure that the Dipole automatic valve is operational and open, that the Convector gage reads 0 and that the backing pump is on, has sufficient oil
- Ensure that the Q3 automatic valve is operational and open, that the Convector gage reads 0 and that the backing pump is on, and has sufficient oil
- Ensure that spectrometer turbo backing pump is on, has sufficient oil and that the automatic valve is operational

## Left Arm (from the computer)

### *Spectrometer controls*

- \_\_\_ Bogie controls checked for operation (do not move)
- \_\_\_ check movement of left collimator for operation at 3 positions
- \_\_\_ check left angle camera for movement in both directions

### *Magnet controls*

Q1

- \_\_\_ Q1 full of liquid (60%) actual reading from computer \_\_\_\_\_
- \_\_\_ Open lead flows on Q1 to 100 slm as read from the Hall A Tools page
- \_\_\_ Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

Q2

- \_\_\_ Q2 full of liquid (80%) actual reading from computer \_\_\_\_\_
- \_\_\_ Open lead flows on Q2 to 75 slm as read from the Hall A Tools page
- \_\_\_ Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

D1

- \_\_\_ Dipole full of liquid (60%) actual reading from computer \_\_\_\_\_
- \_\_\_ Open lead flows on Dipole to 75 slm as read from the Hall A Tools page
- \_\_\_ Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

Q3

- \_\_\_ Q3 full of liquid (80%) actual reading from computer \_\_\_\_\_
- \_\_\_ Open lead flows on Q3 to 100 slm as read from the Hall A Tools page
- \_\_\_ Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

## Right Arm (from the computer)

### *Spectrometer controls*

- \_\_\_ Bogie controls checked for operation (do not move)
- \_\_\_ check movement of right collimator for operation at 3 positions
- \_\_\_ check right angle camera for movement in both directions

### *Magnet controls*

Q1

N/A Q1 full of liquid (60%) actual reading from computer \_\_\_\_\_

N/A Open lead flows on Q1 to 80 slm as read from the Hall A Tools page

N/A Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

Q2

\_\_\_ Q2 full of liquid (80%) actual reading from computer \_\_\_\_\_

\_\_\_ Open lead flows on Q2 to 75 slm as read from the Hall A Tools page

\_\_\_ Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

D1

\_\_\_ Dipole full of liquid (60%) actual reading from computer \_\_\_\_\_

\_\_\_ Open lead flows on Dipole to 75 slm as read from the Hall A Tools page

\_\_\_ Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

Q3

\_\_\_ Q3 full of liquid (80%) actual reading from computer \_\_\_\_\_

\_\_\_ Open lead flows on Q3 to 75 slm as read from the Hall A Tools page

\_\_\_ Actual lead flows A \_\_\_\_\_ B \_\_\_\_\_

## Controls check from the computer console

- \_\_\_ Pull up the Hall A tools page
- \_\_\_ Ensure that all of the lead flows are in the green
- \_\_\_ Ensure that all liquid levels are in the green
- \_\_\_ Ensure that all polarities are correct
  
- \_\_\_ Using the current button open the control page to **left Q1**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ Using the current button open the control page to **left Q2**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ Using the current button open the control page to **left Q3**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ Using the current button open the control page to **left Dipole**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ Using the current button open the control page to **right Q1**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ Using the current button open the control page to **right Q2**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ Using the current button open the control page to **right Q3**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ Using the current button open the control page to **right Dipole**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**
  
- \_\_\_ input .5 GeV/c for both spectrometers
- \_\_\_ Ensure that all magnets lock in for the input momentum
- \_\_\_ list magnets that do not \_\_\_\_\_
  
- \_\_\_ If used open the controls page to **Big Bite**
- \_\_\_ Clear all faults and turn on magnet with correct polarity
- \_\_\_ Ramp magnet to **50 amps**

### ***Target***

- \_\_\_ Windows functional
- \_\_\_ Cctv cameras “on” and focused
- \_\_\_ Target light “on” Control located online at HAREBOOT 6 channel 3 (hlauser)
- \_\_\_ Backing pump “on” at pump
- \_\_\_ Ensure roughing is closed
- \_\_\_ Turbo “on” at rack # 1H75B09
- \_\_\_ Turbo valve “open” at rack # 1H75B09 channel # 1 upper & #2 lower
- \_\_\_ Ensure target **convectron** set point is **5 torr**
- \_\_\_ Gages operational
- \_\_\_ Convectron “0” millitorr at rack # 1H75B09
- \_\_\_ **Cold cathode < 5x10<sup>-4</sup>** at rack # 1H75B08
- \_\_\_ Actual cold cathode reading \_\_\_\_\_

### ***Exit beam tube***

- \_\_\_ **Diffuser cooler on**
- \_\_\_ **Diffuser water level ok**
- \_\_\_ close flow valve and observe flow meter (drops to 0)
- \_\_\_ open flow valve and observe flow meter (rises to 1 GPM) Actual GPM \_\_\_\_\_
- \_\_\_ Backing pump is “on” and operational
- \_\_\_ Valve “open” at pump
- \_\_\_ Turbo “on” at rack # 1H75B09
- \_\_\_ Gages operational
- \_\_\_ **Convectron “<5” millitorr** at rack # 1H75B09
- \_\_\_ Actual convectron gage reading \_\_\_\_\_
- \_\_\_ magnetic shielding installed (if necessary)

### ***Entrance beam tube***

- \_\_\_ Ensure that beam line girder turbo is on and running
- \_\_\_ Ensure that there is cooling water flow to the Moeller Dipole
- \_\_\_ Ensure that E P turbo is on and running
- \_\_\_ Instrument air compressor functioning normally
- \_\_\_ **All beam line vacuum valves “open” (VBV1H04 B and C upstream and downstream of the target visually checked at the valve)**
  
- \_\_\_ Call MCC, get the name of the person you talked to \_\_\_\_\_ and say “I am doing the Hall A pre beam checklist, Please Ensure that the Hall A beam line valves are set to close” after they say that they are, say “I am turning the control key from maintenance to operational are you ready” after they say yes, turn key and tell them **“you have control could you please open the valves so that we can verify operability make an e-log entry”**



## **BigBite**

- \_\_\_ Ensure BigBite magnet is on the forward stops
- \_\_\_ Ensure that BigBite detector guards are removed
- \_\_\_ Ensure that the field read back is working on the Big Bite GUI
- \_\_\_ **Ensure BigBite magnet beacons are operational**

## **Hall**

- \_\_\_ **All interlocks in rack # 1H75B08 indicate green**
- \_\_\_ **Check 3 Moeller power supplies for on and in remote**
- \_\_\_ Ensure installation of Ion chambers at EP, and target
- \_\_\_ Correct LCW flow and pressure (120 psi supply and <50 psi return)
- \_\_\_ Cctv monitors at X terminal off
- \_\_\_ Clear of unnecessary equipment
- \_\_\_ Man lift and Forklift in truck ramp.
- \_\_\_ **Ensure that all lifting slings and safety harnesses are correctly stored and that the storage cage is at least 90 deg from the beam dump and at least 60 ft from the target**
- \_\_\_ Perform pre sweep of run safe boxes.
- \_\_\_ **Move Left spectrometer stairs clear of lower balcony.**

\_\_\_ **Ensure polar crane is positioned over the entrance beam pipe, and that power is off at the power disconnect switch**

\_\_\_ **Ensure that spectrometer entrance window guards are removed**

\_\_\_ **Ensure that spectrometer exit window guards are removed**

\_\_\_ **Ensure that detector VDC covers are removed**

\_\_\_ **Ensure that target window guards are removed**

\_\_\_ Ensure operability of shield house doors

\_\_\_ Deliver checklist to work coordinator

\_\_\_ Make the following entries into the HALOG

“Checklist Complete and Target Window and spectrometer Guards are Removed”

“Angle limits for the Left Spectrometer are \_\_\_\_\_ to \_\_\_\_\_”

“Angle limits for the Right Spectrometer are \_\_\_\_\_ to \_\_\_\_\_”

(Angles given are spectrometer angles and not pin angles!)

“The tech on call at startup is \_\_\_\_\_”

Note any outstanding issues not completed on the checklist

Note any special requirements or restrictions

Name of person checklist was delivered to \_\_\_\_\_