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C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

7.1.65.b Safety Issues Associated with the 6 O’Clock Yellow Valve Box

Text Page 2 through 8

C-A-OPM Procedures in which this Attachment is used.		
7.1.65		

Hand Processed Changes

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Approved: _____ ***Signature on File*** _____
 Collider-Accelerator Department Chairman Date

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SAFETY ISSUES ASSOCIATED WITH THE 6'O'CLOCK YELLOW VALVE BOX

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This document describes the safety issues associated with working on or inside the 6 o'clock yellow valve box. It is not meant to cover the details of every job. A job specific work permit reviewed by appropriate personnel is still required to complete any work inside the valve box.

SAFETY ISSUES

Confined Space.

The 6 o'clock valve box is considered a confined space. Any work inside the box must adhere to the confined space regulations described in the BNL SBMS.

Mechanical Safety

1. Pressurized Helium Sources:

The 6'o clock valve box can potentially be exposed to high pressure Helium and Nitrogen sources. Following is a list of potential sources and the valves that isolate these sources. Refer to attached drawing 3A995066.

Potential pressurized sources include:

1. Warm Supply line
Isolation valves: H6646M, H6644M, H6894M
2. Cold Supply from refrigerator
Isolation Valves: H6609M, H6625A, H6607A, H6705M, H6605A
3. Cold Return to Refrigerator
Isolation valves: H6608A, H6708A, H6604A, H6704A
4. Heat Shield Supply from Refrigerator
Isolation Valves: H6702A, H6745A, H6716A, H6616A
5. Heat shield return from Refrigerator
Isolation Valves: H6610A, H6602A
6. Cooldown return from refrigerator
Isolation valves: H6737A, H6637A, H6736A, H6636A
7. 80K Cooler Connections
Isolation Valves: H9364A, H9369A, H9370A, H9365A, H9375A
8. Warm Return Header
Isolation Valves H6884M, H6885M, H6886M, H6887M, H6888M, H6889M, H6890M, H6891M, H6892M, H6895M, H6722M, H6764M, H6612M, H6617M, H6717M, H6726M, H6728M, H6641M, H6622M
9. Nitrogen Supply from Storage Dewar
Isolation valve: N5016M

Trapped Helium Volumes

The potential exists for trapped pockets of high pressure helium inside the valve box. Prior to penetrating the box, contact the cryo control room at x3837 to verify no trapped helium volumes exist.

2. Vacuum Systems

The only possible operations and environmental issues associated with the vacuum system are locking out the turbo vacuum pumps that are used to establish insulating vacuum. Details are in the electrical safety section

3. Pneumatic Systems

Valves located on the top of the valve box are supplied with compressed air at approximately 100 psig. Air to valves can be isolated via manifolds located at the 6 o'clock valve box. Reference drawing 3A995100.

4. Tube Trailers

Occasionally helium tube trailers are used to pressurize cryo process lines. These penetration can be at various locations inside the valve box and may bypass locked out valves. Any person entering the valve box should inspect the area for a tube trailer connection and check with the cryo control (x3837) room to make sure there are no trailer hazards.

If trailers are stationed at other locations in the Ring, the potential exists for Gas to reach the 6 o'clock yellow valve box via cryogenic process lines (Magnet, Heat shield, utility, Supply and Return). Check with the cryogenic control room to determine if trailers are stationed at other locations in the ring and to insure local LOTO is in place in the area where the trailer connects to the cryo system. If none exists, additional LOTO must be implemented. This will be covered in the job specific work permit.

Electrical Safety

In conjunction with the accident in Coldbox 3 in which a technician burned his hand on a heater, we investigated the potential for a similar event in the yellow valve box in service building 6. Careful inspection of the valve box indicates no lethal voltage potentials and no installed heaters internal to the valve box. There are no feed throughs externally that contain high voltages that would pass into the coldbox.. The only feed throughs (cables labeled 6YA, 6YB, 6YC and 6YE) that exist are for low level instrumentation (temperature sensors).



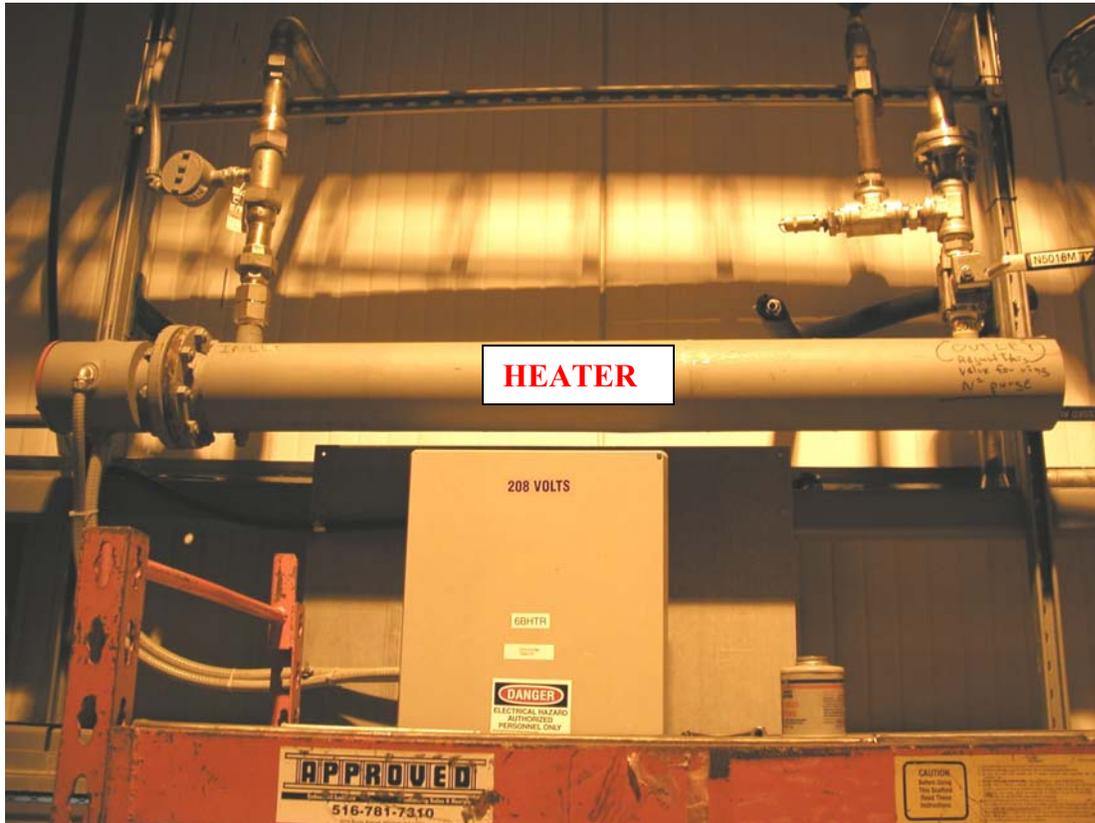
Bottom of Valve Box 6



Top of Valve Box 6

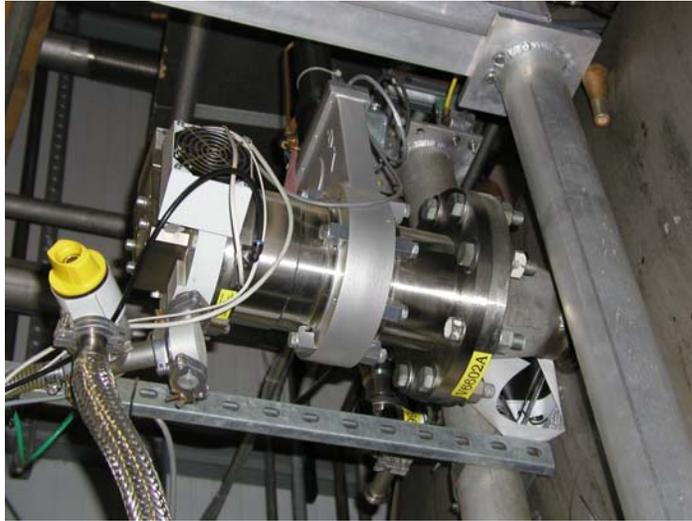
2) We identified a safety switch external of the valve box used to disable the circulator speed control that has no identifier and should be given one, so that it appears on the drawing uniquely identified. Presently the drawing identifies the safety switch generically (3A985088). This is currently being addressed.

3) There is a heater above the ventilation louvers across from the valve box that is not identified as being a heater. In normal use it operates typically at 100F. A label should be added identifying this as a potential hot surface. This is currently being addressed.



Two drawings were identified that detailed voltages in the range of 120Vac – 480Vac. However these voltages are external of the valve box and pose no threat for technicians working inside the valve box.

- 3A985050 - 6:00 yellow valve box insulating vacuum control system. (120Vac and 480Vac 3 phase).



- 3A985088 - RHIC helium circulating pump motor (yellow) wiring diagram.

Normal lockout/tagout procedures should be followed when working on these systems.

Connector signal lists for the upper and lower feedthroughs (A, B, C, E) have been located and are attached to this document. The list clearly shows that all signals are low level instrumentation signals.

Drawings from CVI Incorporated have been located. These drawings go back to the early 90's and were never converted to C_AD format. The drawings reflect both internal and external wiring. The drawings detailing the internal wiring clearly show only instrumentation signals. These drawings should be converted so that they are up to date.

- CVI drawing G771-1400 – RHIC Cryogenic valve boxes elementaries 6 O'clock.
- CVI drawing G771-1423 –6 O'clock Yellow ring AC electrical enclosure.
- CVI drawing G771-1411 –6 O'clock Yellow ring DC electrical enclosure.

Electrical Safety -Power Supply Related

Internal to Valve Box

The valve boxes for RHIC have the superconducting leads from the insertion magnets going through them. These leads are only in the Magnet lines and lead pots. The lead pots have gas cooled leads that allow the insertion shunt power supplies to connect to the magnet circuits. The primary electrical hazard is if one was to cut or open one of the lines or lead pot when some type of electrical testing was occurring. One could not cut or open

a line or lead pot when the magnets are operating. (for apparent reasons) During shut down periods the magnet circuits are connected to ground. Also when ever there are electrical tests there is work a control permit that requires the area be posted and the cryo group to be notified of the test. The insertion power supplies that are connected to the magnet circuits are disabled from turning on during shut down periods, through they can be brought to stand-by state. All these p.s. are low voltage p.s. (20 Volt Max.)

External to Valve Box.

The terminals of the gas cooled leads and the lead heaters are the electrical hazards on the top of the valve boxes. These terminals and lead heaters are in the orange fenced in area that is posted. No personnel should work in this fenced in area unless a work control permit is issued. The lead heaters are 120 volt with thermostat control. The same hazard from the power supplies exists on the top of the valve box in the fenced in area only.