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## Memo

*date: December 7, 2004*

*to: Distribution*

*from: Andrew Ackerman*

*subject: Beam line equipment safety lists; second example*

Efforts to define what equipment are to be included in the beam line equipment safety checklists continue. The following personnel met on December 3, 2004 at beam line U7A to determine what equipment on that line is to be included on the list:

Andrew Ackerman  
John Aloï  
Robert Chmiel  
Steve Ehrlich  
Dan Fischer  
Zugen Fu  
Steve Hulbert  
Anthony Kuczewski

This group inspected the beam line from the shield wall to the end station. Our goal was to find potentially hazardous equipment that could present risk to personnel during maintenance or equipment trouble shooting. The following equipment was found and should be listed:

Ion gauges and controllers  
Ion pumps and controllers  
A voltage capacitor box  
An X-ray source and controller  
High voltage detectors

A sample manipulator  
Pneumatic valves  
A large hydraulic jack

The electrical equipment above is listed because it exceeds BNL electrical hazard range A. The pneumatic valves, sample manipulator, and hydraulic jack are included because they each have sufficient stored energy to present a concern.

There was considerable discussion during this exercise. A summary of the important points raised follows:

- There is an ion pump on the front end of this line, but the controller is located on the experiment floor below the beam line. We decided that this is NSLS equipment and is not to be included on the beam line list.
- There are various electrical items at the beam lines such as computers, televisions, coffee machines, etc, that all exceed BNL electrical hazard range A. These items are not to be included in these beam line equipment safety lists as they are common household or consumer devices. Our goal is to identify beam line equipment that may not be well understood to all and so could present a hidden risk. Common retail consumer items need not be included.
- We found motorized mechanical equipment with pinch points that could cause an injury during operation. These items are not to be included on the list as they contain no stored energy. They do present some risk during operation that should not be ignored. Where possible, this issue is to be resolved with guarding. Information about this concern is best communicated during BLOSA training with an entry on the beam line BLOSA checklist.
- Many beam line components are wrapped with heating tape for vacuum bake out and, when operating, get hot enough to present risk to personnel. Again, these items are not to be included on the list as they contain no stored energy. They too are best identified during BLOSA training with an entry on the beam line BLOSA checklist.
- It is not enough just to count the ion pumps or gauges on the beam line and place a single entry on the list indicating that number. We ask that you provide a simple description of the location of each device along the line as well as the location of the controller. For example:

There are 11 ion pumps:

- 2 between the first valve and the front end with each controller directly below the device
- 1 just upstream of the slit tank; the controller is located just upstream of the end station
- etc.

Inspection at U7A confirmed that these lists are worth developing. The exercise of going over the line looking for potential concerns can only help. We expect mostly to find the ion pumps and gauges, but see that each line is unique and these inspections will help us identify components that could otherwise be overlooked. At U7A those items were the X-ray source and controller, the sample manipulator, and the voltage capacitor box. The hydraulic jack is also unique and worth listing, but everyone agreed that it would be hard to imagine someone releasing that jack without first supporting the load.

We have now completed inspection of two beam lines; one X-ray and one VUV. From that effort, we have determined that the following common items are to be included on these lists.

Electrical

Ion pumps and controllers  
Ion gauges and controllers  
High voltage detectors

Mechanical

Pneumatic valves  
Vibration isolation springs

Distribution:

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