

Assessment of Personnel Safety in PHENIX/MVD

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Introduction:

A personnel safety assessment was performed for PHENIX/MVD activities in LANL Group P25, as well as associated visitors and students. All PHENIX/MVD activities in TA53, Building 1 and TA3 Building SM218 were included in this assessment. This document is broken up into three sections:

Elements of Project and Associated Operations

The activities planned for the next year are outlined, followed by associated tasks for these activities. Those tasks considered to have a potential personnel safety hazards are italicized.

Potential Hazards and how they are being addressed

The potential personnel safety hazards from the first section of this document are summarized and ranked in order of possible degree of hazard. The approach to addressing these potential safety hazards is described.

Action Items

In this section, action items which are being taken to ensure the safety of all MVD personnel are described.

Elements of Project and Associated Operations:

(Potential hazards are italicized)

- Analysis of beam test and lab data, computer simulations, generation of engineering drawings:
 - *Operation of computers and peripherals*
- Construction and study of MVD full-scale mechanical prototypes and magnet nosecones:
 - *Operation of machine shop tools*
 - *Work on elevated platform (5' 8.5" from floor)*
 - *Operation of handtools*
 - *Machining of G10*
- Construction and testing of prototype liquid cooling system of MVD motherboard
 - *Use of epoxy*
 - *Operation of power supply (100W, 0-25V, 5A)*
 - *Operation of refrigerated water bath*

- Construction and testing of MVD air-cooling systems
 - Use of machine shop tools*
 - Use of handtools*
 - Use of epoxy*
 - Operation of power supply(100W, 0-25V, 5A)
 - Operation of fan unit with associated power supply-(0-30V, <0.25amp)
 - Operation of refrigerated water bath

- Environmental tests of Rohacell support structure
 - Operation of power supply (30V, <0.25A)

- Identification of glue candidate for adhering silicon wafer to foam support structure
 - Use of adhesives*

- Identification of glue candidate and development of glue dispensing procedure for kapton cable to silicon detector
 - Use of adhesives*

- Fabrication procedure development and construction of Rohacell foam RF Enclosure
 - Use of adhesives*
 - Machining of Rohacell*
 - Operation of machine shop tools*
 - Operation of oven*

- Operation of 1064nm Class 1 Laser Diode including optical fiber for purpose of testing silicon detectors and associated electronics
 - Bias supply [Operates at 28V(60V max), 0.5A] - has guard on circuit
 - Electronic Instrumentation
 - No special procedures for Class 1 laser (see attached memo)

- Testing of silicon detectors and electronics, construction of silicon assemblies
 - Use of radioactive sources*
 - VME and CAMAC Crates*
 - Electronic Instrumentation
 - Operation of power supplies [50V (500V max) <2.5mA, 102V max,<2mA]

- Tours

Potential Personnel Safety Hazards (in ranked order) and how they are being addressed:

Operation of machine shop tools:

Simple machining tasks are often included in MVD activities. No personnel operates machine shop tools unless they have been properly trained according to P25 Mechanical Fabrication Shop Policy. Properly trained personnel who have been authorized to operate machine shop tools will follow recommended MSDS procedure for such materials as Rohacell and G10.

Work on elevated platform of Full-scale Mechanical Prototype

Construction of elevated platform was done in accordance to recommendations by the SM218 Building and Facility Manager and ES&H in constructing a safe and approved structure according to OSHA and Laboratory Policy. We will continue to use safe procedures when working on the platform.

Exposure to radiation:

Radiological sources are often utilized in the testing of silicon detectors. The only MVD personnel involved in these tests have successfully passed Radiological Worker 1 Training. Signs are posted indicating when radiological source is in use. No source requires special work permits or radiological work permits.

Use of handtools:

MVD personnel follow OSHA and Laboratory Policy during operation of handtools. In addition, a knowledgeable group engineer trains the MVD personnel prior to operation of the handtool.

Use of adhesives and epoxies -

Laboratory Policy and safe practices are adhered to when working with adhesives and epoxies. MSD sheets for all of the chemicals used in the laboratory are in well-marked areas and identified to all MVD personnel. The adhesives and epoxies, as well as all other chemicals, are stored in properly labelled cabinets. The vent hood in the SM218 machine shop needs minor modifications before it can be certified. This is an action item.

VME, NIM and CAMAC crates

We are utilizing some partially populated VME and CAMAC crates in our laboratory setup which contain modules with exposed circuit boards. Unused slots in these crates are covered. This remains an action item as we need to improve our practice of continuously covering unused slots.

Operation of oven

We use an oven in SM218 and another in TA53 Building 1 to heat samples of Rohacell. MSDS sheets are always consulted prior to the heating of any component. Safe procedure and fire-proof gloves are always utilized when operating oven.

Action Items from 1996:

All action items from 1996 have been dealt with. These include:

- Bias of Laser Diode [Operate at 28V (60V max) 0.5A]
- Exposed slots VME and CAMAC crates (procedure needs to be further improved)
- Radiological sources to be swept by RCT. Post signs indicating when radiological sources are in use
- Top-Heavy Air conditioning Units
- Roof Leaks in SM218
- Compressed gas bottles
- General Housekeeping
- Safe procedure for Tours
- Continue safety discussions (procedure needs to be further improved)

Action Items from 1997:

- Schedule meeting with P21 magnet group moving into SM218 to understand safety hazards of their project. Separate working areas of P21 and P25 with brightly colored tape. Document safety hazards from P21 and distribute our safety document to P21.
- Fix lid to source cabinet. Since moving the source cabinet to the MVD half of SM218, it was noticed that the lid can be easily removed. We will secure the lid to the cabinet.
- Partially populated VME, NIM and CAMAC crates. The wide slots which existed last year in our experimental configurations, exposing circuit boards, were covered with board, thus disabling contact. Since then, the electronics modules have been rearranged and smaller open slots are now
- Arrange for minor modifications to machine shop vent hood to complete certification of hood. Have discussions with ES&H to verify that the adhesives with which we now work can be mixed and dispensed outside of a vent hood.
- Improve safety awareness by adding safety discussions periodically to the MVD weekly meetings. Generate a safety checklist for MVD participants.