

# Magnetism Reflectometer User Orientation

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SPALLATION NEUTRON SOURCE

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Magnetism Reflectometer  
User Orientation

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## Magnetism Reflectometer User Orientation

### **Objective**

To familiarize users with policies and procedures governing research activities at the SNS and the Magnetism Reflectometer, and to review features of the target building and beam line. This document contains the material covered during the instrument/target building site specific training, which is conducted in person by a member of the BL4A staff.

### **Description**

This document provides a general overview of the Magnetism Reflectometer (MR) beam line and those parts of the target building with which a MR user will interact on a daily basis or during emergencies. In addition, policies and procedures governing appropriate work practices are reviewed.

### **Precautions**

Failure to follow the policies, procedures and work practices described in this document may result in the unintentional release of activated samples to non designated areas, may expose users or personnel to unsafe conditions, could damage equipment and could potentially result in the cancellation of an experiment or the loss of beam time.

### **References**

SNS document 107050000-PR0001-R00 Beam Line 4A IPPS Operating Procedure for Users

SNS document 107050000-PR0002-R00 Sample Handling on the Magnetism Reflectometer

## **Contact Information**

This list is posted at several locations on the beam line. Please note that the main source of after hours support is the Instrument Hall Coordinator, who has staff present twenty-four hours a day, seven days a week during an operations cycle.

In the event of an emergency requiring ORNL Emergency Medical Technician or Fire Protection Services, call ORNL: dial 911 from any land line; dial (865) 574-6606 (the Lab Shift Supervisor, or LSS) when using a cell phone.

# ORNL 911: 911

## From cell phone (865) 574-6606

**Lead Instrument Scientist** – Valeria Lauter

(Call after 10:00 PM only in case of emergency)

Office: (865) 574-5389

Cell: (865) 387-5389

**Scientific Associate** – Rick Goyette

(Call after 10:00 PM only in case of emergency)

Cell: (865) 274-8340

**Postdoctoral Scientist** – Hailemariam Ambaye

Office: (865) 574-9096

Cell: (864) 986-8120

Home: (865) 769-4954

Central Control Room: (865) 576-1502

Instrument Hall Coordinator: (865) 241-4432

Radiation Control Technicians: (865) 574-6588

Chopper Group Pager: (865) 417-6352

DAS Group: (865) 574-0753

Detector Group: (865) 705-3650

Sample Environment: (865) 719-0656

Target Building Operations Coordinator – Dave Freeman

Office: (865) 382-4863

Cell: (865) 382-4863

Personnel Protection Systems: (865) 241-2727

## Introduction

The Magnetism Reflectometer (MR), located on beam line 4A (BL4A), is one of the initial instruments to be commissioned at the Spallation Neutron Source. The MR has a dedicated staff consisting of an instrument scientist, a post-doctoral scientist, and a scientific associate. In addition, specialized components are supported by separate, shared, groups (choppers, detectors, data acquisition systems, etc.). As a result, a large group of support personnel is available to insure that users experience while visiting the SNS is as pleasant and problem free as possible.

SNS site specific training and MR instrument specific training is required for users to have full, unescorted access to the target building and the instrument cave. However, this “full access” only pertains to specific, predefined tasks that will be clearly identified to the user by a member of the beam line 4A staff. The SNS is a highly complex collection of components and systems, as is the MR; so occasional problems do arise, which require patience and understanding. **Do not attempt to perform a task that has not been detailed in advance, and stay within the defined scope of those predefined tasks. Do not attempt to correct or repair equipment problems should they occur during your beam time.** Contact the MR Scientific Associate during normal business hours if you require any assistance. The SNS Instrument Hall Coordinator is available 24/7 during operations cycles, and is the first call you should make if assistance is needed outside normal business hours. Please refer to the contact information provided in this document, or posted throughout the beam line area. The Instrument Hall Coordinator will evaluate the problem, determine whether another group’s assistance is required and make calls as appropriate for the condition and time of day.

Only samples that have been approved in advance may be placed in the beam. This approval process is done in advance as part of the proposal submission process. Never place a sample in the beam that has not been approved, and for which the appropriate checklist and activation analysis has not been posted.

Feedback (the constructive kind) is always welcome. Please take some time during your stay to write down what you like and what you think could be improved. We cannot guarantee that we will make any changes based on your comments, but we do guarantee that we will read, and consider any comments you submit.

## Access

Access to the target building is provided through the pedestrian bridge connecting the CLO second floor to the target building mezzanine. The CLO elevator nearest the CLO main entrance exits on the second floor quite close to the doors accessing the pedestrian bridge:



Turning left after exiting the elevator, continue down the corridor until it ends at the double doors, access to which is restricted via a proximity card reader.



Keep in mind that parts of the target building are still a construction area. As a result, there will occasionally be signs or notices posted at this door stating that personnel protective equipment (hard hats, safety glasses and steel toed shoes) is required when entering the target building via the pedestrian bridge.



If such a sign is posted do not attempt to use the bridge without first obtaining appropriate PPE from a member of the MR staff. Alternate target building access routes (that do not require PPE) will be provided if this condition exists for more than a very short time.

To unlock the door to the pedestrian bridge, hold your proximity card next to the reader until it beeps and the door unlocks.



**Note:** All users should scan their “proximity” card using the reader, no “piggybacking” is allowed. It is the responsibility of all users to verify that members of their party scan their proximity card when entering the target building, whether using the pedestrian bridge or other access doors.

The pedestrian bridge is enclosed, and climate controlled.



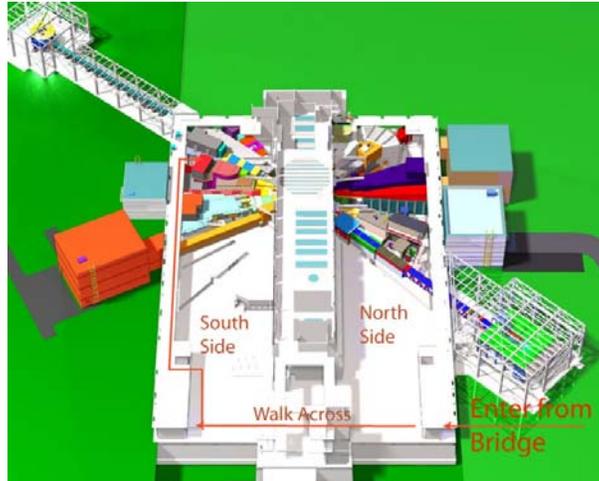
Walk across the pedestrian bridge and enter the target building through the double doors at the other end.



There is no proximity card reader at the other end of the bridge. Entering the target building, the first office on the right is the Instrument Hall Coordinator office:



The Instrument Hall Coordinator and his staff has the responsibility of providing all after hours support, in addition to normal hours assistance that is provided by members of the beam line 4A staff. Continue across the mezzanine, taking the walkway directly ahead, and cross from the “north” side of the target building to the “south side”.





Enter the first set of doors, and proceed through the second set of doors.



Notice that the second set of doors is equipped with a Radiation Portal Monitor. This is a fail safe, pass through monitor, through which you must pass prior to exiting the target building. Additional information on the portal monitor will be provided later.



Continue along the mezzanine until you arrive at beam line 4A





Exit the mezzanine at beam line 4A, the magnetism reflectometer.



As you pass the entrance to the beam line 4A instrument hutch you will notice a posting showing the experiment that is currently running on the magnetism reflectometer, as well as a beam line 4A call list.





The O2 level monitor and the Radiation level monitor, which display conditions within the instrument cave.



The Instrument Personnel Protection System User panel, which is used to open and close the secondary shutter.



The exterior stack light, the blue Oxygen Deficiency Hazard strobe light and the PPS message board.



The cave status light reference posting, located at the exterior stack light station.

**NOTICE**

**Do not enter without permission from beam line personnel.**

If uncertain of conditions or in case of questions **STOP** and contact **BL 4A** staff:  
Valeria Lauter, 865-576-5389  
Haile Ambaye, 865-574-9096  
Rick Goyette, 865-274-8340

**CAUTION**

**DO NOT PASS HEXAPOD TABLE EDGE WITH FERROMAGNETIC MATERIAL WHILE MAGNET IS OPERATING**

**CAUTION**

**Magnetic Field**

**Person having implanted cardiac pacemakers, suture staples, aneurysm clips, prostheses, etc. should not pass beyond this point when the magnet is operating.**

The instrument cave door postings, which list important safety information and conditions that exist inside the cave.

Inside the instrument cave are several items of special interest:



The interior stack light and emergency shutdown button. This button, and the one located near the cave door and pictured below, are to be used to close the secondary shutter and disengage the magnetic lock on the instrument cave door in the event that personnel are inside the instrument cave when the secondary shutter is opened.



Note the sign as you leave the cave. Everything that has been inside the cave when the secondary shutter was open must be surveyed by an RCT prior to being taken back out of the cave. There are no exceptions, and it does not matter where the item was within the cave.



## Target Building Features

### Rest Rooms

The target building rest rooms are located next to the south side roll up door, and may be accessed from the mezzanine via the south side stair well.



**Note:** Construction is ongoing within the target building. Most construction activity is confined to the first floor, but temporary restrictions can occur anywhere within the target building. Watch for postings and barriers which indicate an area where PPE is required.



**Do not cross the barrier with the “PPE Required...” sign unless you are wearing the appropriate PPE.**

Using the stairs, proceed to the first floor. Exit the stairwell to the target building main floor. Stay within the designated walkway and proceed to the rest rooms.



Note the signs at the exit of the stairwell.



### **Fire Alarms**

Fire alarms pull stations are located throughout the target building. Those closest to beam line 4A are located near the exterior door on the first floor, on the mezzanine walkway between beam line 4A and the stairwell to the rest room, and near the door connecting the north and south sides of the building.



These fire alarm pull stations may be used to alarm the building occupants, as well as the ORNL Fire Department, in the event of a fire. In the event of a fire alarm, or an intercom notice to evacuate the target building, proceed out of the building via the nearest safe exit. The nearest door to beam line 4A is located between beam line 4A and the Beam line 2 hall way.



### **Fire Extinguishers**

Fire extinguishers are located throughout the target building. Fire extinguishers may only be used by trained members of the SNS staff. Do not attempt to use a fire extinguisher to fight a fire. Call 911 or use the fire alarm pull station and then exit the building through the nearest safe exit.

### **Radiological Monitoring Stations**

Radiological monitoring stations are located throughout the target building.



Follow the instructions posted near the alarm if an alarm sounds.

## Target Building Radiation Portal Monitor

There is a radiation portal monitor located at the doors near the Instrument Hall Coordinator Office, as well at stairwell six, on the south side mezzanine.



This monitor will automatically perform a whole body radiological scan as you pass through the door. Personnel should pass through the radiation portal monitor one at a time. Wait for others to clear the monitor before entering. Follow the directions posted at the door if the monitor alarms.



## **Automated External Defibrillator (AED)**

An Automated Emergency Defibrillator (AED) is located near the rest rooms on the first floor of the target building.



As is the case with performing CPR, the decision to use an AED is a personal one. Perform CPR or use the AED only if you have been properly trained and are comfortable doing so. Call 911 from any land line phone (call the LSS at (865) 574-6606 from any cell phone) for any emergency.

## **Safety First**

The DOE, ORNL and SNS have strict regulations governing all work activities. As a User you will be trained on the necessary operations required for you to perform your experiment safely. Activities that fall either outside the scope of your training or SNS requirements are not allowed.

You are the person best able to assure your safety and health. Please work defensively by looking for potential hazards, such as back and eye injury risks, electrical hazards and hand traps before you start your experiment. **PLAN YOUR WORK FOR SAFETY.**

Only **qualified** staff may work on open electrical chassis with power on; this includes observation, manipulation, monitoring of energized equipment and resetting circuit breakers. **Never open electrical racks or panels, or manipulate electrical equipment, unless specifically instructed to do so by BL4A staff.**

Users are not qualified workers and are only permitted to:

- Plug and unplug office equipment, appliances, scientific, and similar equipment to/from standard receptacles
- Replace batteries in calculators, flashlights and similar equipment

If you need help in for any reason, please contact the Instrument Hall Coordinators

There are lots of warning signs posted at the beam line and in the target building. All of these signs are posted to help insure the safety of users and SNS personnel. It is important for everyone to read, understand and follow the directions on all posted signs.

The instrument cave is a controlled area; this means that anything that has been inside the cave while the secondary shutter was open must be surveyed by an RCT prior to being removed from the cave. This applies to samples, tools, personal effects like glasses, pens, watches, etc. To minimize inconvenience please make sure to take out all items you bring into the cave prior to opening the secondary shutter.

Take some time every day to review the alarms you may encounter, and the responses to those alarms.

Be aware of any work being conducted in your area. Overhead crane work, welding, pipe fitting and other activities are ongoing, and have the potential of impacting users and personnel on beam line 4A. This may require the use of PPE when using portions of the mezzanine, the need for hearing protection, or the need to exit the instrument hutch or cave area to allow the overhead crane to transport a load overhead. PPE (with the exception of safety shoes) is available from a member of the beam line staff. Please comply with request from staff or craft workers, who have a keen interest in your safety.

Other potential, credible emergencies or hazards include electrical shock hazards, pressurized water, compressed gases, hydrogen gas, and medical emergencies. Cryogenic helium and hydrogen may be present during operation of the Moderator system. Refer to the SNS document *Hazards and Controls on the Magnetism Reflectometer* for a list of hazards and associated controls on the beam line. Contact LSS- Dial 911 using land line or dial 574-6606 using a cell phone or activate emergency pull box if you do not have access to phones.