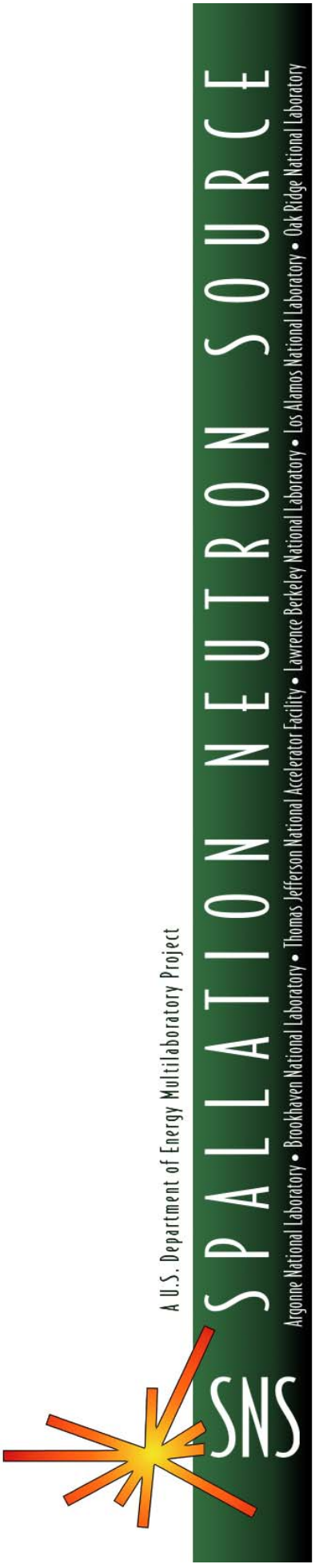
Magnetism Reflectometer
User Orientation

Revised 9/21/2010



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User Orientation

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Revised 9/21/2010

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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, to review features of the target building and beam line, including alarms and responses, sample handling and IPPS User Panel operations. 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 overview of the Magnetism Reflectometer (MR) beam line and those parts of the beam line with which a MR user will interact on a daily basis, as well policies and procedures governing appropriate work practices.

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.

Contact Information

This list is posted at several locations on the beam line. Please note that the main source of afterhours 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

Office: (865) 574-5389

Cell: (865) 387-5389

Scientific Associate – Rick Goyette

Cell: (865) 274-8340

Postdoctoral Scientist – Hailemariam Ambaye

Office: (865) 574-9096

Cell: (864) 986-8120

Home: (865) 769-4954

Target Building Manager – Ray Savino

Office: (865) 574-5996

Cell: (865) 382-0627

Instrument Support Manager – Bobby Cross

Cell: (865) 660-7082

Central Control Room: (865) 576-1502

Instrument Hall Coordinator: (865) 241-4432

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.

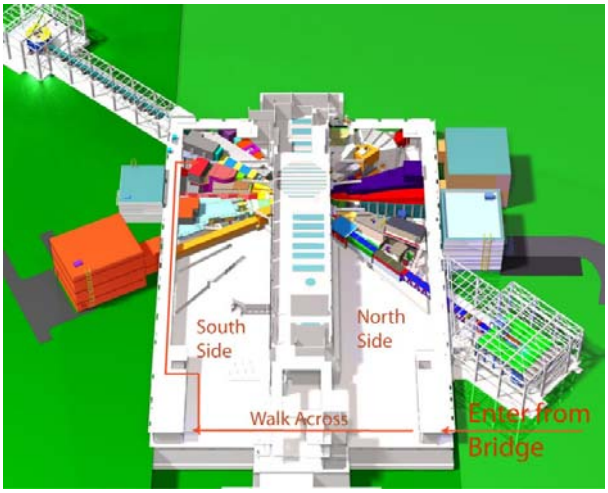
SNS site specific training and MR instrument specific training is required for users to have full, unescorted access to the target building and the instrument cave. However, this "full access" only pertains to specific, predefined tasks that will be clearly identified to the user by a member of the beam 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.



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.

This call list is located a several different locations at BL4A. A telephone is located within the instrument hutch, as well as within the instrument cave. An additional phone is located near the door located on the first floor.

Beam Line Features

Samples are mounted, and data collected, within the instrument cave, located on the target building first floor and accessed using the staircase from the mezzanine immediately in front of the instrument hutch. Walk down the stairs to the instrument cave door.

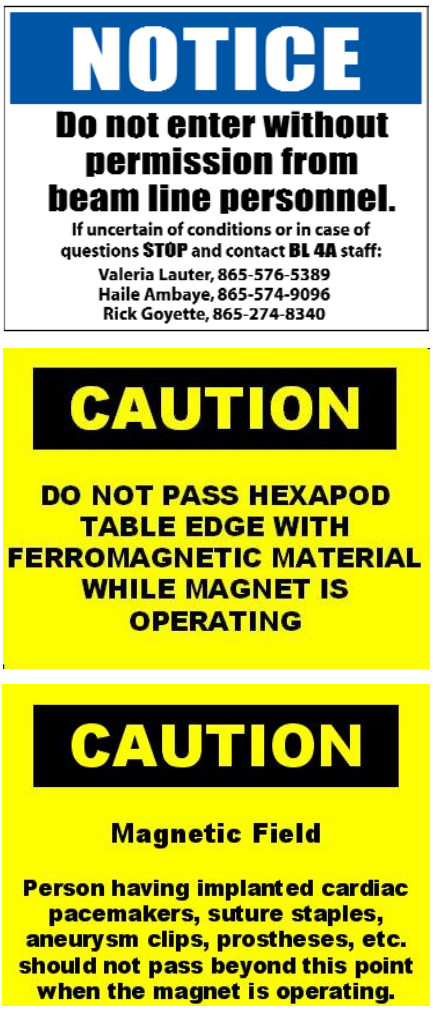
As you approach the door, notice the following items:

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.



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:

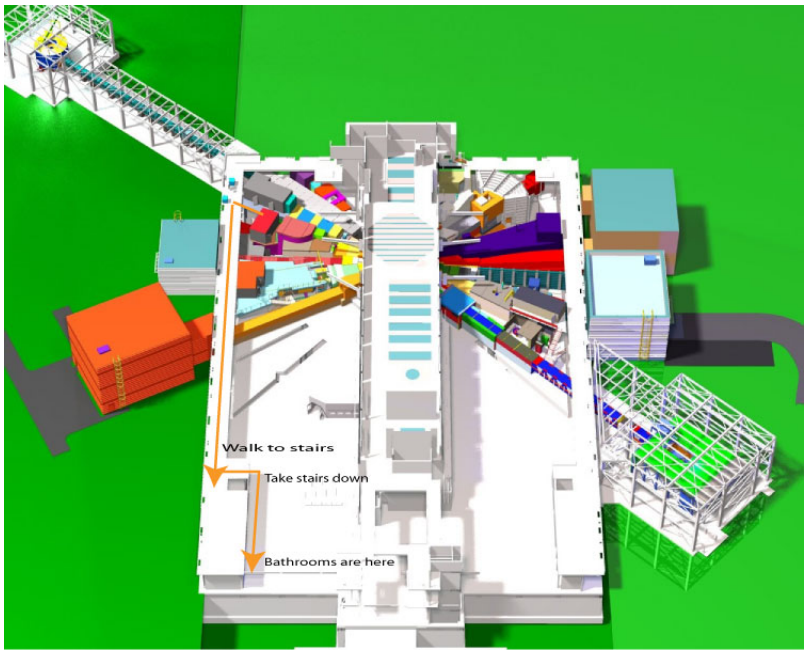
The interior stack light and emergency shutdown button. This button, and the one located near the cave door and pictured below, are to be used to close the secondary shutter and disengage the magnetic lock on the instrument cave door in the event that personnel are inside the instrument cave when the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



<u>Note</u>: 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.

<u>Safety First</u>

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.**

<u>Users are not qualified workers</u> 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
- Perform other tasks that have been reviewed and approved in advance.

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

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.

Alarms and Responses

Radiation Alarms
Alarm Indication
Magenta beacon is flashing 
Immediate Action
• **Close Secondary Shutter** • **Exit Area** • **Call Instrument Hall Coordinator (241-4432) and RCT (574-6588) for assistance.** • **Notify Lead Instrument Scientist.**
Description
The beacon is illuminated and remains so when the radiation levels at the radiation detector (outside of the shielding enclosure) exceed 5 mrad/hr. This is not a normal mode of operation for the instrument but may be permitted if the area is properly posted and controlled and prior authorization has been granted by the NSSD ESH/Operations staff, and if proper, predetermined procedures are followed. If this alarm point is reached without prior approval, close the secondary shutter, exit the area and call the Instrument Hall Coordinator (241-4432) and an RCT (574-6588). Do not attempt to open the secondary shutter without correcting the cause **and first** notifying the Lead Instrument Scientist (or designee) or the Instrument Hall Coordinator. Note that once radiation levels drop below 5 mrad/hr it will take approximately thirty seconds for the beacon to stop flashing.

Alarm Indication
Magenta beacon is flashing, audible alarm is sounding  **Message Display Reads "Beam Off, High Rad Call CCR 576-1502"** 
Immediate Action
• **Exit Area** • **Call Instrument Hall Coordinator (241-4432) and RCT (574-6588) for assistance.** • **Notify Lead Instrument Scientist.**
Description
This condition is reached if the radiation level as measured at the radiation detector (outside of the shielding enclosure) exceeds 20 mrad/hr. The IPPS will initiate the **IPPS Fault Detection Sequence** to remove the hazard. If the magenta beacon remains illuminated, exit the area. Call the Instrument Hall Coordinator (241-4432) and an RCT (574-6588) and ask them to come to the instrument. Do not attempt to open the secondary shutter until the condition causing the elevated radiation field is corrected. Continued operation will require an "Enable" of the IPPS.

Alarm Indication
Message Display Reads "Beam Off, Rad Fail Call PST 241-2727" 
Immediate Action
Call the indicated number and report the problem.
Description
The **IPPS** will initiate the **IPPS Fault Detection Sequence** removing any possible hazard due to elevated radiation fields. The radiation detector has failed and requires maintenance by a member of the **Protection Systems Team** – call the indicated number and report the problem. Do not attempt to operate the secondary shutter.

Alarm Indication
Cave Mode status lights display two different colors

Message Display Reads “PPS Fault Call PST 241-2727”

Stack light <u>may</u> display steady green, or steady green and blinking red light

Immediate Action
• **Exit Area** • **Call Instrument Hall Coordinator (241-4432) and RCT (574-6588) for assistance.** • **Notify Lead Instrument Scientist.**
Description
A hardware failure has occurred in the IPPS and requires maintenance by a member of the **Protection Systems Team** – call the indicated number and report the problem. Do not attempt to operate the secondary shutter. If this condition occurs when the **secondary shutter** is **open** the stack lights will display a **flashing red light** in addition to a **steady green light**. If this condition occurs when the **secondary shutter** is **closed** the stack lights will display **only a steady green light**. The **IPPS** will initiate the **IPPS Fault Detection Sequence** if this error occurs when the secondary shutter is open.

Alarm Indication
Message Display Reads "PPS Fault Call PST 241-2727"    **No stack lights are illuminated** 
Immediate Action
• **Exit Area** • **Call Instrument Hall Coordinator (241-4432) and RCT (574-6588) for assistance.** • **Notify Lead Instrument Scientist.**
Description
A hardware failure has occurred in the IPPS and requires maintenance by a member of the **Protection Systems Team** – call the indicated number and report the problem. Do not attempt to operate the secondary shutter. The **IPPS** will initiate the **IPPS Fault Detection Sequence** if this error occurs when the secondary shutter is open.

Oxygen Deficiency Hazard Alarms

Alarm Indication

Blue strobes flashing

Audible alarm sounding in cave and Message Display Reads "Low O2, Do Not Enter Call CCR 576-1502"

Immediate Action

- **Leave the cave immediately if inside or do not attempt to enter cave if outside.**
- Call the **Instrument Hall Coordinator** (241-4432) and ask them to come to the instrument. Inform the Instrument Hall Coordinator of an ODH event, and request the Instrument Hall Coordinator close the GN2 feed valve, located above the BL4B hutch if an uncontrolled GN2 release potentially could be responsible for the ODH event.
- Horn may be silenced by depressing **alarm acknowledge** button on ODH display.

Description

This condition is caused by an oxygen deficiency hazard inside the sample enclosure "cave" (ODH cutoff set point is 19.5% O_2; a normal O_2 level is about 21%). **Leave the cave immediately if inside or do not attempt to enter cave if outside.** The actual O_2 concentration will be displayed on the O_2 display.
Call the **Instrument Hall Coordinator** (241-4432) and ask them to come to the instrument. Inform the Instrument Hall Coordinator of an ODH event, and request the Instrument Hall Coordinator close the GN2 feed valve, located above the BL4B hutch if an uncontrolled GN2 release potentially could be responsible for the ODH event. Do not attempt to open the cave door until the condition causing the oxygen deficiency is corrected. Continued operation will require an "Enable" of the IPPS.
Note: Horn may be silenced by depressing alarm acknowledge button on ODH display.

Alarm Indication

Blue strobes flashing

Audible alarm sounding in cave and no Stack Lights are illuminated

Message Display Reads "02 Detector Fail Call PST 241-2727"

Immediate Action

- **Leave the cave immediately if inside or do not attempt to enter cave if outside.**
- Call the **Protection Systems Team** and report the "O_2 detector fail" message.
- Horn may be silenced by depressing **alarm acknowledge** button on ODH display.

Description

This condition will occur when a failure occurs within the O_2 monitoring system. **Leave the cave immediately if inside or do not attempt to enter cave if outside.** Call the **Protection Systems Team** and report the "O_2 detector fail" message. *Note: Horn may be silenced by depressing alarm acknowledge button on ODH display.*

Other Alarm Messages

Alarm Indication

Cave Mode remains in Beam Permit, even though Mode Selector key is in the Access position

Message Display Reads "Detector not in safe position"

Immediate Action

- **Restore all keys to their Beam Permit Positions**
- **Drive detector table to "home" (zero degree) position**
- **Repeat procedure to change cave mode to Access**

Description

The detector table must always be in the zero degree, or "home" position before access to the cave is granted. If the detector table is in any other position the cave mode will remain in beam permit, and access to the cave is denied. To correct this condition, restore all key positions to their beam permit positions (mode selector key to sweep complete, **Ig** key to **Beam permit**…don't forget to push the **Press to Secure** button before trying to turn the **Ig** key) and drive the detector table angle to zero degrees. Then repeat the process of returning the cave mode to **Access**: Rotate the **Ig** key clockwise ninety degrees to its trapped, **Cave Access/Sweep Required**, position. Rotate the **Mode Selector** key to the **Access** position. If the conditions inside the cave allow, the cave mode will revert to **Access**, and the green Access status lights will illuminate, and the door will be unlocked, and may be opened with the door control **Open** button. If the status continues to remain in **Beam Permit**, contact a member of the BL4A staff or an **Instrument Hall Coordinator (241-4432)** for assistance.

Site/Facility Wide Indications

Alarm Indication

Announcement "Tornado Warning has been issued for this area. Building 8700 occupants proceed to Target Control Room in Target Facility Basement immediately."

Immediate Action

Proceed to, and remain at the Assembly Point until the "All Clear" announcement is given (refer to the emergency map and directions at the end of this document for the location of the target building assembly points).

Description

A tornado has been spotted in the immediate area and the laboratory issues a tornado warning. Proceed to, and remain at the Assembly Point until the "All Clear" announcement is given (refer to the emergency map and directions at the end of this document for the location of the target building assembly points).

Alarm Indication

Announce "Target Facility Shelter-in-Place. Building 8700 occupants proceed to Conference Room TA-103 on Instrument Floor immediately."

Immediate Action

Proceed to, and remain at the Assembly Point (Conference Room TA-103 on Instrument Floor) until the "All Clear" announcement is given (refer to the emergency map and directions at the end of this document for the location of the target building assembly points).

Description

An abnormal condition exists in the target building or surrounding area which requires all personnel to proceed to and remain in an area which is equipped with an air handling system which is separate from the air handling system for the rest of the target building. Proceed to, and remain at the Assembly Point (Conference Room TA-103 on Instrument Floor) until the "All Clear" announcement is given (refer to the emergency map and directions at the end of this document for the location of the target building assembly points).

Alarm Indication

Announce "Target Facility Evacuation. Building 8700 occupants proceed to the nearest Assembly Point immediately."

Immediate Action

- Exit target building immediately.
- Proceed to, and remain at the Assembly Point until the "All Clear" announcement is given (refer to the emergency map and directions at the end of this document for the location of the target building assembly points).

Description

Target Facility Evacuation

a. Announce "Target Facility Evacuation. Building 8700 occupants proceed to the nearest Assembly Point immediately."
b. Repeat announcement.
c. Target Facility ERT members conduct area sweeps while proceeding to designated Assembly Point.
d. Remain at the Assembly Point until the "All Clear" announcement is given.
e. In the event of an Emergency evacuation of MBA 060, the following actions shall be taken to ensure the integrity of the nuclear materials inventory:

    - The MBA 060 Representative/ Alternate shall be responsible to see that no loss of nuclear materials has occurred.
    - The MBA 060 Representative/ Alternate shall be responsible to immediately report to the NMC&A Department any discrepancies or unusual situations which could indicate a loss of control of nuclear materials.

Other Indications
Alarm Indication
Observed water or hydraulic leak. Smell/see smoke, strange smell, strange sound
Immediate Action
• **Call Instrument Hall Coordinator (241-4432) for assistance.** • **Notify Lead Instrument Scientist.**
Description
Beam line 4A uses water cooled equipment (choppers, lasers) which may leak, causing potential hazards and equipment damage, as well as electrical or mechanical hazards. Non-SNS personnel should not attempt to remedy leaks. You smell smoke, or see smoke from a piece of equipment, or detect a strange or unusual smell, or hear an unusual or suspect noise.
Alarm Indication
Unusual/Questionable motor movement
Immediate Action
• Press **Motor Emergency Stop Button**, located on the right door of the motor motion control panel, located inside the beam line 4A cave. • **Call Instrument Hall Coordinator (241-4432) for assistance.** • **Notify Lead Instrument Scientist.**
Description
You observe or suspect that a motor or piece of motor driven equipment is behaving in an unusual manner, or makes an unusual or suspect noise.

Sample Handling

NOTE: The sample position on the Magnetism Reflectometer is between the pole pieces of an electromagnet. It is imperative that the electromagnet be turned off before continuing with the sample handling procedure. A member of the beam line staff will explain the procedure for turning off the electromagnet during the instrument specific training session.

Perform sample handling procedures in accordance with those procedures and practices described in the Practical Factors training you received upon arriving at SNS.

Samples may only be removed from the sample holder and placed into the sample storage bin, located inside of the instrument cave.

Do not remove the sample from the cave.

NOTE: To have a sample released that has been in the neutron beam at the Magnetism Reflectometer instrument, you must contact a RCT at 865-574-6588. Radiological Control Technicians are the only staff at SNS who can release potentially radioactive or radioactive samples from posted areas.

IPPS User Panel Operations

Performing a sweep of the BL4A instrument cave

An instrument cave sweep is performed to ensure that no one is in the instrument cave when the door is closed in preparation for opening the secondary shutter.

It is intended that only trained individuals may perform a sweep of the instrument cave, and that these individuals ACTUALLY LOOK through the entire cave to ensure that there is no one else in the cave, either hiding, incapacitated, asleep or working behind equipment and obstructed from view.

Take a moment to become familiar with the beam line 4A IPPS User Panel, which is located at the entrance to the instrument cave. Review the list of keys used in operating the IPPS User Panel. A larger version of this picture, as well as other components of the IPPS User Panel, is located at the end of this procedure.

Beam Line 4A IPPS User Panel

The IPPS User Panel is separated into two sections: the **Secondary Shutter Control** section and the **Cave Access Control** section. Performing a sweep only requires the use of one key in the **Cave Access Control** Section: the **Mode Selector** key. When the secondary shutter is closed and the cave door is open the **Mode Selector** key will be in the **Access** position, and the indicator lights, located below the selector key, will be green.

Mode selector key and status lights in Access Mode

To begin a sweep of the instrument cave, turn the **Mode Selector** key to the **Sweep Requested** position. The amber **Sweep Requested** status lights will illuminate.

Mode Selector key and status lights in Sweep Requested Mode

Note

A sweep request may be canceled at any time by turning the **Mode Selector** key back to the **Access** position, even if the key has been removed from the user panel. Simply reinsert the **Mode Selector** key and rotate it to the **Access** position. The **Access** status lights will illuminate and the request will be canceled.

Once a sweep has been requested, the amber light on the exterior stack light station will illuminate.

Exterior Stack Light Station amber light illuminated

Remove the **Mode Selector** key from the user panel and take it into the instrument cave to the search station, located at the far wall of the cave.

Note

Notice as you pass the Interior Stack Light/E-Stop Station that the green (Access) light is still illuminated. This is normal. When the IPPS is operating correctly one, and only one, stack light will be illuminated at all times. If no stack lights are illuminated, or more than one stack light is illuminated, an IPPS fault condition has occurred. In the event of an IPPS fault condition, exit the instrument cave and notify the instrument hall coordinator (241-4432). Do not attempt to reenter the instrument cave until the fault is corrected.

Interior Stack Light/E-Stop Station Access light illuminated

Insert the key into the search station and turn the key **clockwise**. Wait a second and then turn the key back **counterclockwise**.

4A Search Station, with Mode Selector key inserted and turned

The Interior Stack Light amber light is now illuminated.

Interior Stack Light amber illuminated

Remove the key from the search station and return to the user panel and reinsert the key into the **Mode Selector** position. Close the cave door using the close button on the cave door control station.

Cave Door Control Station

Once the cave door is closed completely, rotate the **Mode Selector** key to **Sweep Complete**. The amber **Sweep Complete** status lights will illuminate. There will be an audible metallic sounding click as the magnetic lock on the cave door engages.

Mode Selector Key and Status Lights in Sweep Complete Mode

The Instrument Cave Sweep Procedure is now completed.

Note

If the Mode Selector key is rotated to Sweep Complete prior to the cave door being closed completely the cave mode will revert to access mode, the green Access mode lights on the user panel and both stack lights will illuminate, and the sweep process will have to be repeated. If this occurs, rotate the Mode Selector key back to access and begin the sweep procedure again.

Opening the Secondary Shutter

To open the secondary shutter, press and hold the button labeled **Cave Press to Secure**, located to the right of the trapped key labeled **Ig** on the **Cave Access Control** section of the user panel.

Cave Press to Secure Button

The green light labeled **Key(s) Free When Illuminated**, located above the trapped key will illuminate.

Trapped Key **Ig**

Continue to press the Cave **Press to Secure** button, and rotate the trapped key **Ig** and remove it from the panel. The **Beam Permit** status lights on the user panel and the Red light on the stack light station will illuminate, and the warning horn inside the cave will sound for twenty seconds. This horn is to warn anyone who may have inadvertently been locked inside the instrument cave that the secondary shutter is opening.

WARNING

In the event that you are inside the instrument cave and the warning horn sounds IMMEDIATELY press the nearest red E-STOP button to close the secondary shutter and unlock the instrument cave door.

Push the instrument cave door open to exit the cave. The E-STOP buttons are located in the following two locations:
Next to the cave door

And on the interior stack light/E-STOP station

The red **Beam Permit** lights on both the lower and upper sections of the **IPPS User Panel** will now be illuminated.

Beam Permit status lights illuminated

Insert the key labeled **If** into the **If** trapped key position located in the **Secondary Shutter Control** section of the user panel. Rotate the key **clockwise** ninety degrees to its trapped, **shutter operation permitted**, position.

The **If** key, inserted and rotated to the shutter operation position

Momentarily press the **Secondary Shutter Open** button, located on the **Secondary Shutter Control** panel.

Secondary Shutter Open/Close buttons

The message board will display the **Beam On** message.

Red stack light illuminated with Beam On message

The secondary shutter will take approximately ten seconds to open, the red **Open** light, located underneath the **Remote Shutter Control** key, will illuminate. All red **Beam Permit** lights, and

the **Open** lights for both the primary and secondary shutters will now be illuminated, and the secondary shutter will now be open.

User Panel showing all red lights illuminated

Closing the Secondary Shutter

To close the secondary shutter, momentarily push the green **Secondary Shutter Close** button.

Secondary Shutter Open/Close buttons

The message board will display the **Beam Off Prim-Open Secd-Clsd** message.

Message board displaying Beam Off message

Press and hold the button labeled Shutter Control **Press to Secure**, located to the right of the trapped key labeled **If** on the **Secondary Shutter Control** section of the user panel. The green

light labeled **Key(s) Free When Illuminated**, located above the trapped key will illuminate. Continue to press the Shutter Control **Press to Secure** button, and rotate the trapped key **If counterclockwise** to the **Key Free** position and remove it from the panel.

The **If** key, inserted and rotated to the shutter operation position

Entering the Instrument Cave

Insert the key labeled **Ig** into the **Ig** trapped key position located in the **Cave Access Control** section of the user panel. Rotate the **Ig** key **clockwise** ninety degrees to its trapped, **Cave Access/Sweep Required**, position.

Trapped Key **Ig**

The amber **Sweep Complete** status lights will illuminate.

Mode Selector Key and Status Lights in Sweep Complete Mode

Rotate the **Mode Selector** key to the **Access** position.

Mode selector key and status lights in Access Mode

The cave door is now unlocked, and may be opened with the **Open** button on the door control station.

Cave Door Control Station

Note

Conditions inside the instrument cave may prevent the cave access mode from returning to Access mode, even though the mode selector key has been rotated to the Access position.

The most common condition under which this occurs is when the detector table is not at the zero angle "home" position. If this is the case the message board will display the following message:

To correct this condition, restore all key positions to their beam permit positions (mode selector key to sweep complete, Ig key to Beam permit…don't forget to push the Press to Secure button before trying to turn the Ig key) and drive the detector table angle to zero degrees. Then repeat the process of returning the cave mode to Access as listed above: Rotate the Ig key clockwise ninety degrees to its trapped, Cave Access/Sweep Required, position. The amber Sweep Complete status lights will illuminate. Rotate the Mode Selector key to the Access position. If the conditions inside the cave allow, the cave mode will revert to Access, and the green Access status lights will illuminate, and the door will be unlocked, and may be opened with the door control Open button. If the status continues to remain in Beam Permit, contact a member of the BL4A staff or an Instrument Hall Coordinator (241-4432) for assistance.

Keys used in operating the User IPPS Panel

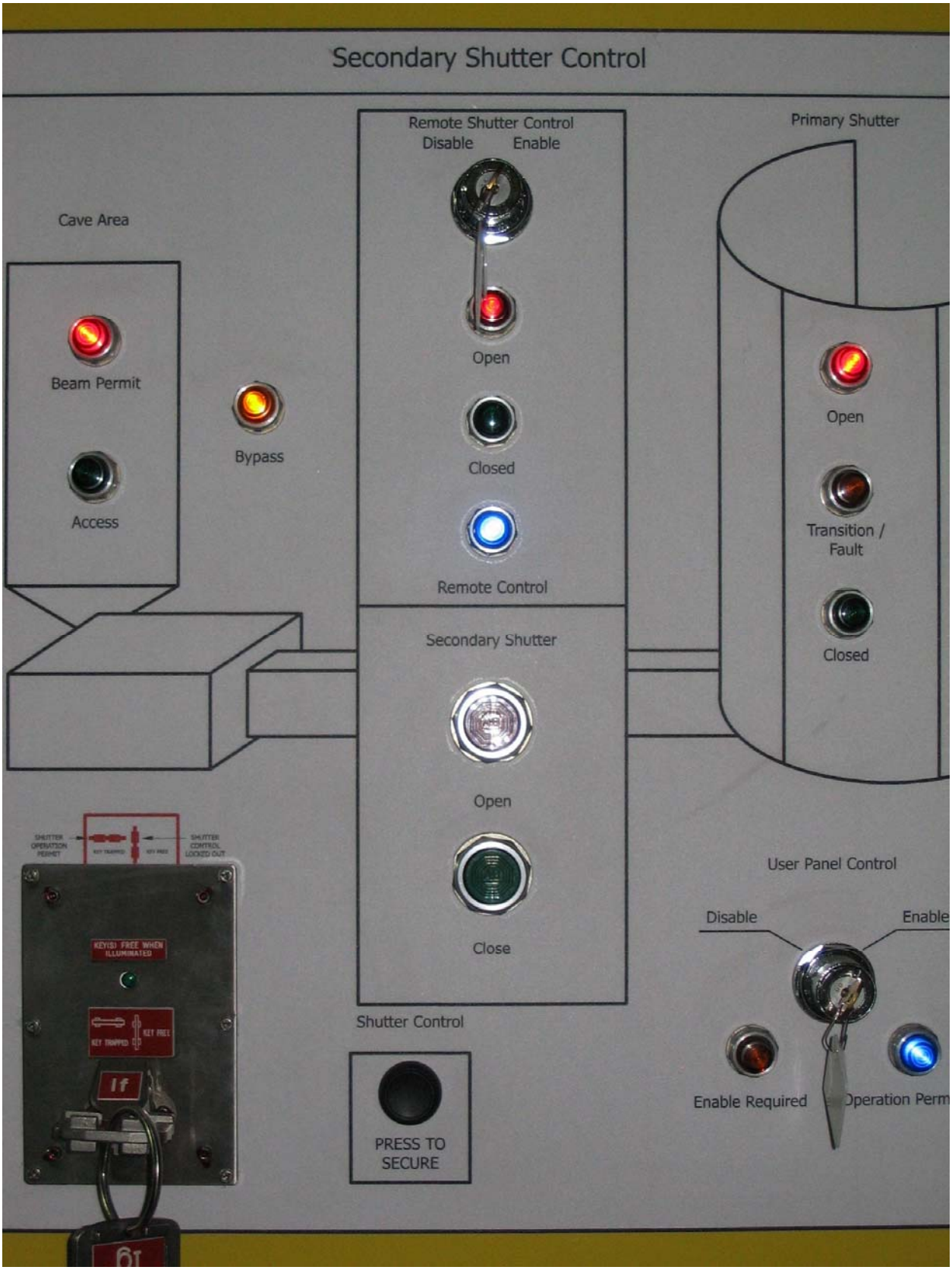
The following table lists the keys and their functions.

Key Name	Function/Purpose
User Panel Control	This key controls operation of the User IPPS Panel. It is normally in the custody of BL4 staff, which has the authority to Enable or Disable the panel. This key is normally locked the lockbox that is attached to the beam stop. Users will not have access to the User Panel Control key.
If	This is a trapped key physically joined to trapped key Ig (see below). It will be in its trapped (horizontal) position when the Cave is in Access and during a Sweep. It may be removed upon Sweep Complete to enter Beam Permit and to free trapped key Ig to open the secondary shutter (see Section 5.2 below). To free the key, press the Press to Secure button, wait for the green light above the keyhole to light, then rotate the key to free (vertical). When not in its keyhole in the User IPPS Panel, it will be found dangling from the Ig keyhole in the User IPPS Panel.
Bypass Selector	This key is used to place the beam line in either Normal mode, in which certain motorized equipment operation (detector table drive and hexapod) is disabled when the instrument cave door is open, or in Bypass more, in which this equipment is allowed to operate when the instrument cave door is open. This key normally resides in the lockbox attached to the BL4A beam stop. The lockbox is under the control of BL4A personnel. The bypass mode is a staff procedure. Users will not have access to the bypass key.
Mode Selector	This key is used to set Cave access status and has three positions. The left-most position sets cave Access, center position sets Sweep Requested, and the right-most position sets Sweep Complete. It is normally stored in its keyhole in the User IPPS Panel, is removed during a Sweep, and replaced upon Sweep Complete (see Section 5.2 below).
Remote Shutter Control	This key Enables and Disables remote operation of the shutter via the Data Acquisition System. It is normally in the custody of the Instrument Team and remains locked in the lockbox that is attached to the beam stop.
Ig	This is a trapped key physically joined to trapped key If (see above). It will be in its trapped (horizontal) position for Shutter Operation Permit. When removed or in the free (vertical) position, Shutter Control is Locked Out. To free the key, press the Press to Secure button, wait for the green light above the keyhole to light, then rotate the key to free (vertical). When not in its keyhole, it will be found dangling from the If location in the User IPPS Panel.

IPPS User Panel Components

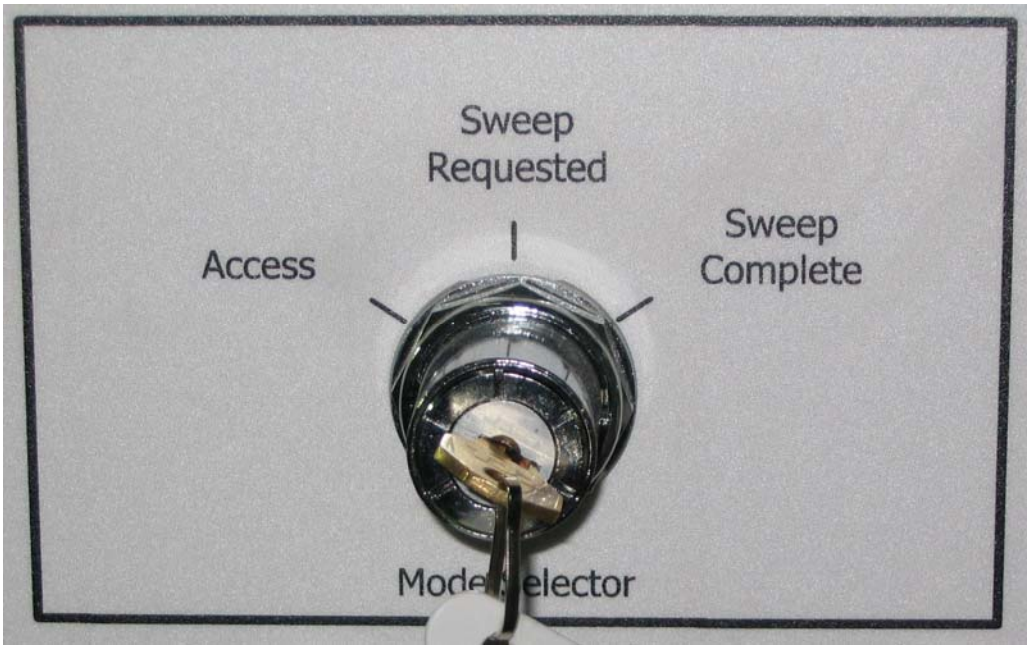
Here is a set of larger images of the IPPS User Panel and its components.

IPPS User Panel



IPPS User Panel Secondary Shutter Control Section

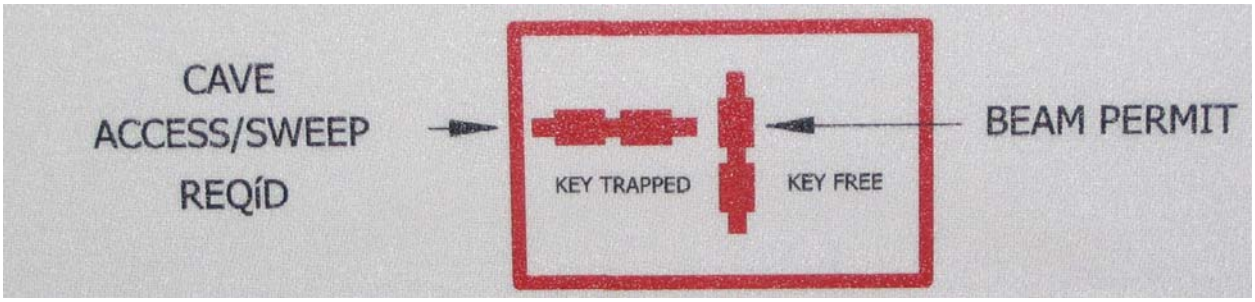
IPPS User Panel Cave Access Control Section



Mode Selector Key

Cave Access Status Lights

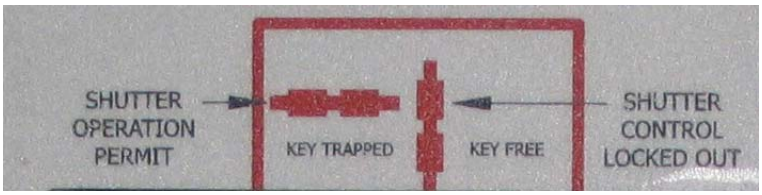
Ig Trapped Key



Ig Trapped Key Position Indicator

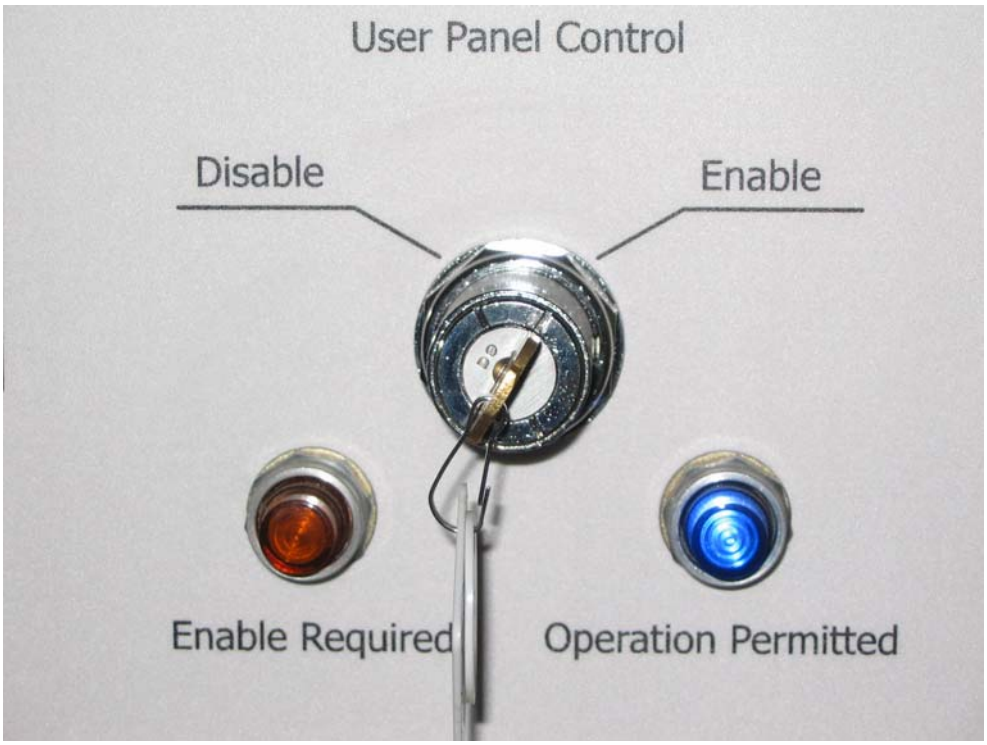
Cave Press to Secure Button

If Trapped Key



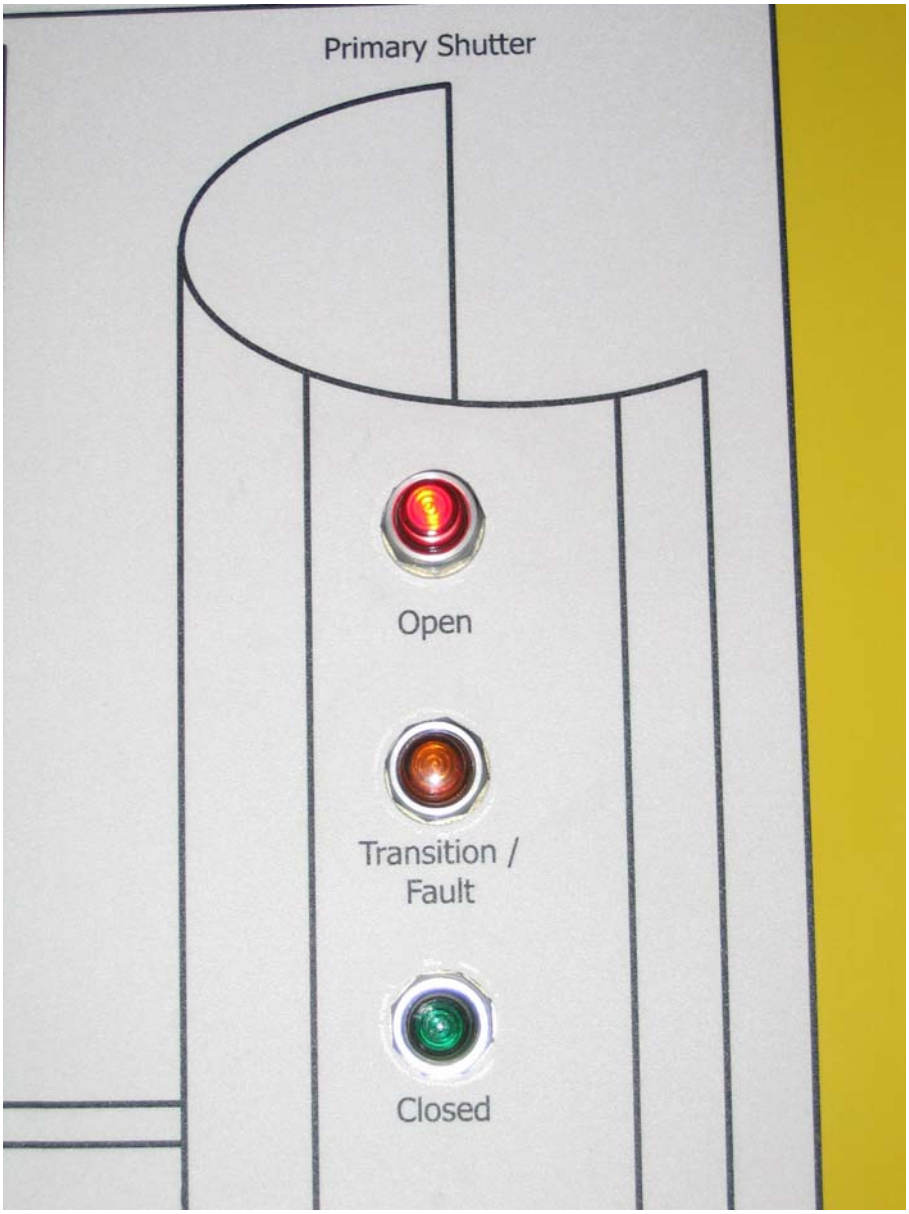
If Trapped Key Position Indicator

Shutter Control Press To Secure Button

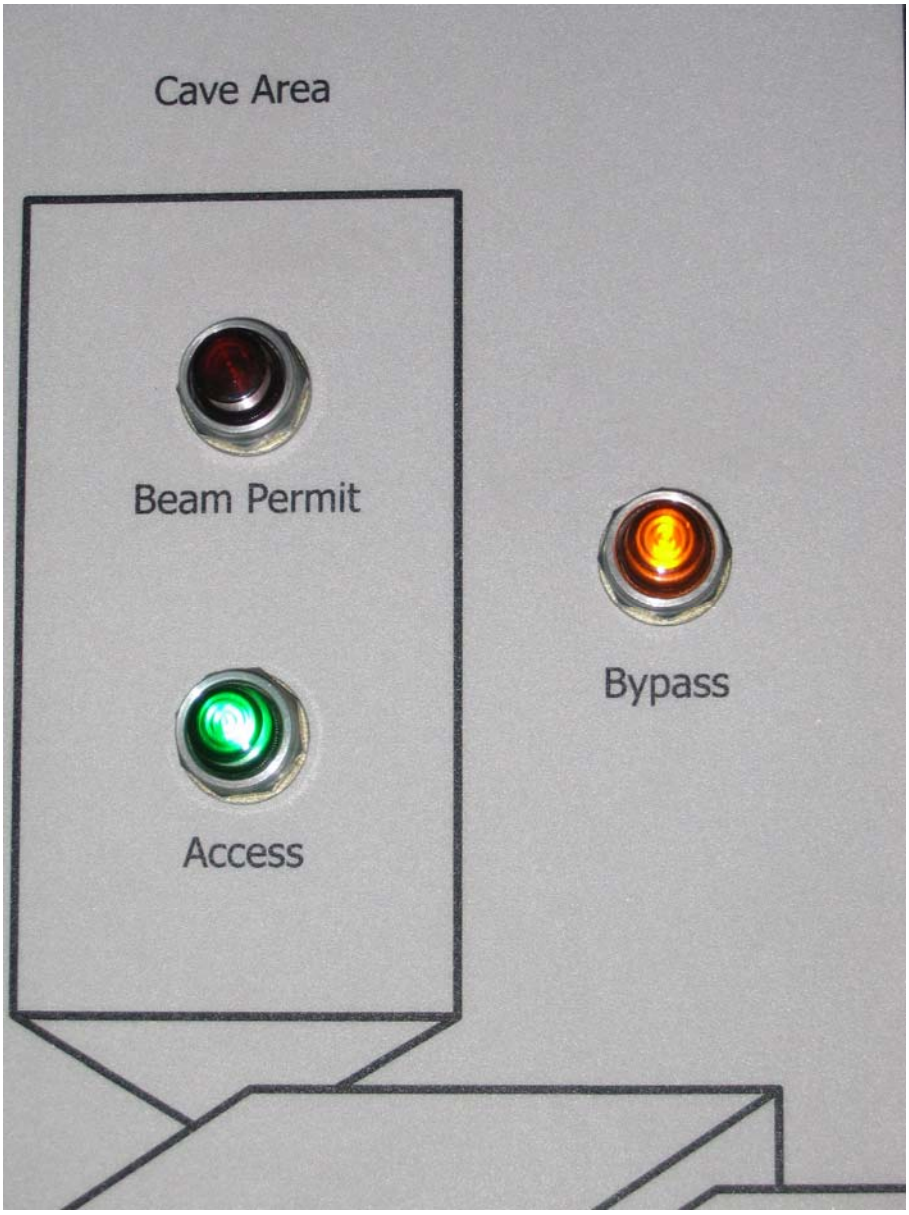


User Panel Control Key

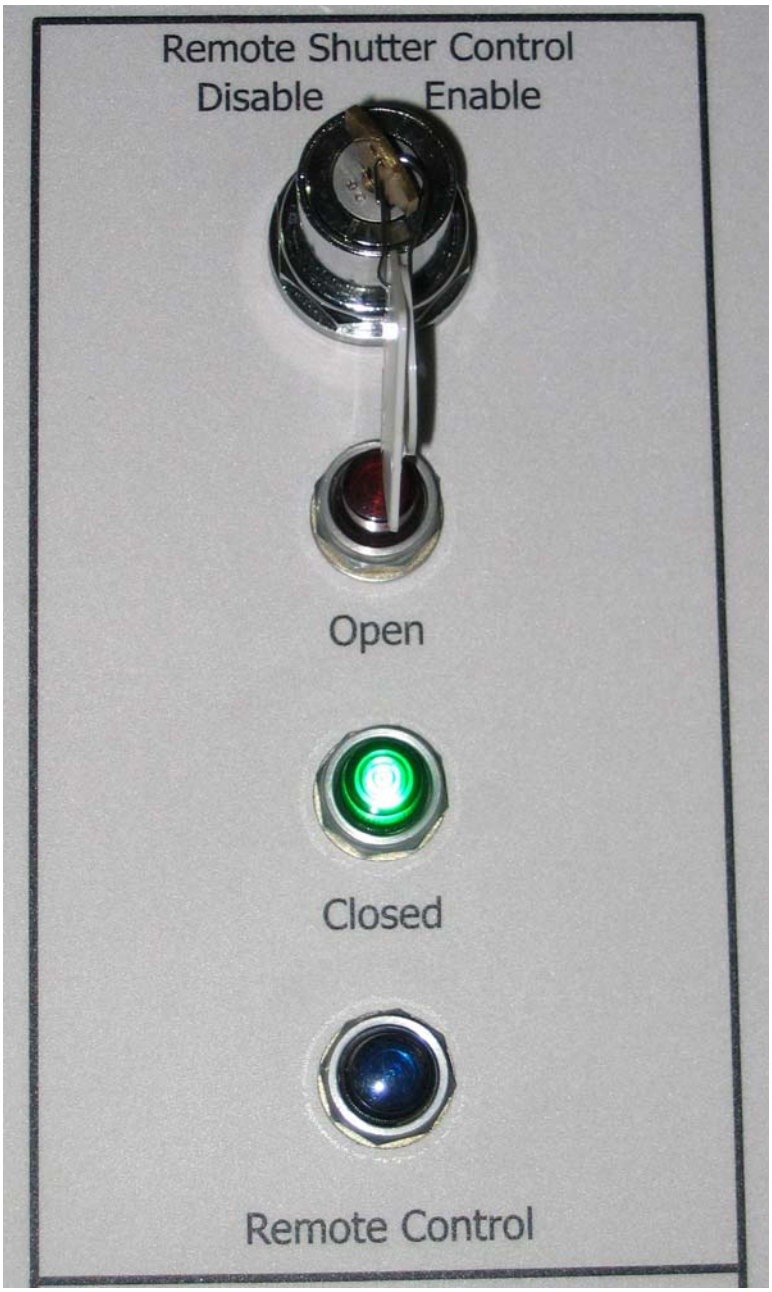
User Panel Bypass Key



Primary Shutter Indicator



Cave Access Indicator



Remote Shutter Control Key/Indicator and
Secondary Shutter Indicator

Secondary Shutter Control