



## 5.U-4B.1

### Procedure for Alarms and Response at the Liquids Reflectometer

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<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>

Approved: \_\_\_\_\_ **Signature on File** \_\_\_\_\_  
Liquids Reflectometer Lead Instrument Scientist Date

Approved: \_\_\_\_\_ **Signature on File** \_\_\_\_\_  
Low Q Group Leader Date

Approved: \_\_\_\_\_ **Signature on File** \_\_\_\_\_  
NSSD ES&H/ Operations Manager Date

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**SNS-OPM 5.U-4B.1**  
**Procedure for Alarms and Response at the Liquids Reflectometer**

**1. Purpose**

1.1 This procedure provides responses required to alarms that can be encountered during operation at the Liquids Reflectometer.

**2. Responsibilities**

2.1 The **Liquids Reflectometer Instrument Scientist** or designee is responsible for ensuring that personnel performing work in the area of the Liquids Reflectometer read, understand, and follow this procedure.

2.2 The **Instrument Hall Coordinators** has the responsibility for reading, understanding and following this procedure, and for contacting appropriate groups and personnel to address emergency situations safely and in accordance with DOE/ORNL/SNS/NSSD requirements and procedures.

**3. Prerequisites**

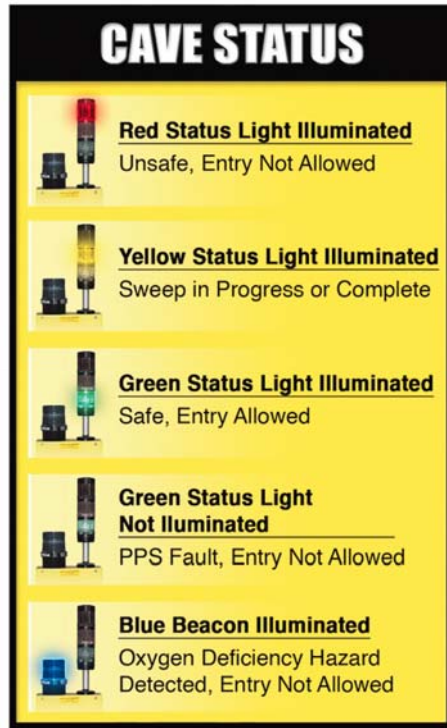
3.1 SNS staff and users must read [SNS-OPM 3.A-1.5.4B.2](#), Procedure for Operation of the Liquids Reflectometer User IPPS Panel.


**4. Precautions**

4.1 NONE

**5. Procedure**

**IPPS Message display, alarm indicators and actions to take in response to alarms**



<b>Radiation Alarms</b>	
<b>Alarm Indication</b>	
<b>Magenta beacon is flashing</b>	
	
<b>Immediate Action</b>	
<ul style="list-style-type: none"> <li>• Close Secondary Shutter</li> <li>• Exit Area</li> <li>• Call Instrument Hall Coordinator (241-4432) and RCT (574-6588) for assistance.</li> <li>• Notify Lead Instrument Scientist.</li> </ul>	
<b>Description</b>	

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 authorization has been granted by the SNS Radiation Safety Officer (RSO). If this alarm point is reached without prior approval of the SNS RSO, close the secondary shutter. Closing the secondary shutter should remove the elevated radiation level, but if the magenta light still remains illuminated, exit the area and call the Instrument Hall Coordinator (241-4432) and an RCT (574-6588). If the magenta light turns off, determine the cause of the elevated radiation. If the cause is unclear or undetermined, call the RCT at 574-6588 and request the assistance. 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.

### Alarm Indication

**Magenta beacon is flashing**




**And 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**

<p><b>assistance.</b></p> <ul style="list-style-type: none"> <li>• <b>Notify Lead Instrument Scientist.</b></li> </ul>
<b>Description</b>
<p>This condition is reached if the radiation level as measured at the radiation detector (outside of the shielding enclosure) exceeds 20 mrad/hr. The IPSS will already have closed the secondary shutter removing 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 IPSS.</p>

<b>Alarm Indication</b>
<p><b>Message Display Reads “Beam Off, Rad Fail Call PST 241-2727”</b></p>

<b>Immediate Action</b>
<p>Leave the area, call the indicated number and report the problem.</p>
<b>Description</b>
<p>The radiation detector has failed and requires maintenance by a member of the <b>Protection Systems Team</b> – call the indicated number and report the problem. The IPSS will terminate the flow of neutrons to the instrument to prevent any possible hazard due to elevated radiation fields.</p>

<b>Oxygen Deficiency Hazard Alarms</b>
<b>Alarm Indication</b>
<p><b>Blue strobes flashing</b></p>



**Audible alarm sounding in cave and Message Display Reads “Low O<sub>2</sub>, 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 to contact PPS to identify the cause 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<sub>2</sub>; a normal O<sub>2</sub> level is about 21%). **Leave the cave immediately if inside or do not attempt to enter cave if outside.** The actual O<sub>2</sub> concentration will be displayed on the O<sub>2</sub> 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 contact PPS to identify the cause 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

**Audible alarm sounding in cave and Stack Lights not illuminated**



**Message Display Reads “O<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> monitoring system. **Leave the cave immediately if inside or do not attempt to enter cave if outside.** Call the **Instrument Hall Coordinator** (241-4432) and report the “O<sub>2</sub> detector fail” message.

*Note: Horn may be silenced by depressing alarm acknowledge button on ODH display*

**Site/Facility Wide Indications**

**Alarm Indication**

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

<b>Immediate Action</b>
Proceed to, and remain at the Assembly Point until the “All Clear” announcement is given
<b>Description</b>
<p><b><u>Take Cover (i.e. Tornado Warning)</u></b></p> <ol style="list-style-type: none"> <li>a. Announce “Tornado Warning has been issued for this area. Building 8700 occupants proceed to Target Control Room in Target Facility Basement immediately.”</li> <li>b. Repeat announcement.</li> <li>c. Target Facility Emergency Response Team members conduct area sweeps while proceeding to designated Assembly Point.</li> </ol> <p>Remain at the Assembly Point until the “All Clear” announcement is given.</p>
<b>Alarm Indication</b>
Announce “Target Facility Shelter-in-Place. Building 8700 occupants proceed to Conference Room TA-103 on Instrument Floor immediately.”
<b>Immediate Action</b>
Proceed to, and remain at the Assembly Point (Conference Room TA-103 on Instrument Floor) until the “All Clear” announcement is given.
<b>Description</b>
<p><b><u>Shelter-In-Place (External hazard that requires intake air to be secured).</u></b></p> <ol style="list-style-type: none"> <li>a. Announce “Target Facility Shelter-in-Place. Building 8700 occupants proceed to Conference Room TA-103 on Instrument Floor immediately.”</li> <li>b. Repeat announcement.</li> <li>c. Target Facility ERT members conduct area sweeps while proceeding to designated assembly area.</li> <li>d. Secure the following sources of inlet air to room TA-103. <ol style="list-style-type: none"> <li>i. Air Handling Unit TA-1.</li> <li>ii. Air Handling Unit TA-2.</li> <li>iii. TA-103 Exhaust Fan TA-12.</li> </ol> </li> <li>e. Remain at the Assembly Point until the “All Clear” announcement is given.</li> </ol>

<b>Alarm Indication</b>
Announce “Target Facility Evacuation. Building 8700 occupants proceed to the nearest Assembly Point immediately.”
<b>Immediate Action</b>
<ul style="list-style-type: none"> <li>• Exit target building immediately. (See Attachment)</li> <li>• Proceed to, and remain at the Assembly Point until the “All Clear” announcement</li> </ul>



is given.
<b>Description</b>
<p><b><u>Target Facility Evacuation</u></b></p> <ol style="list-style-type: none"> <li>a. Announce “Target Facility Evacuation. Building 8700 occupants proceed to the nearest Assembly Point immediately.”</li> <li>b. Repeat announcement.</li> <li>c. Target Facility ERT members conduct area sweeps while proceeding to designated Assembly Point.</li> <li>d. Remain at the Assembly Point until the “All Clear” announcement is given.</li> <li>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: <ul style="list-style-type: none"> <li>• The MBA 060 Representative/ Alternate shall be responsible to see that no loss of nuclear materials has occurred.</li> <li>• The MBA 060 Representative/ Alternate shall be responsible to immediately report to the NMC&amp;A Department any discrepancies or unusual situations which could indicate a loss of control of nuclear materials.</li> </ul> </li> </ol>

<b>Other Indications</b>
<b>Alarm Indication</b>
Observed water or hydraulic leak. Smell/see smoke, strange smell, strange sound
<b>Immediate Action</b>
<ul style="list-style-type: none"> <li>• <b>Call Instrument Hall Coordinator (241-4432) for assistance.</b></li> <li>• <b>Notify Lead Instrument Scientist.</b></li> </ul>
<b>Description</b>

Beam line 4B 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.
<b>Alarm Indication</b>
Unusual/Questionable motor movement
<b>Immediate Action</b>
<ul style="list-style-type: none"> <li>• Press <b>Motor Emergency Stop Button</b>, located on the right door of the motor motion control panel, located inside the beam line 4B cave.</li> <li>• <b>Call Instrument Hall Coordinator (241-4432) for assistance.</b></li> <li>• <b>Notify Lead Instrument Scientist.</b></li> </ul>
<b>Description</b>
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.

**6. Documentation**

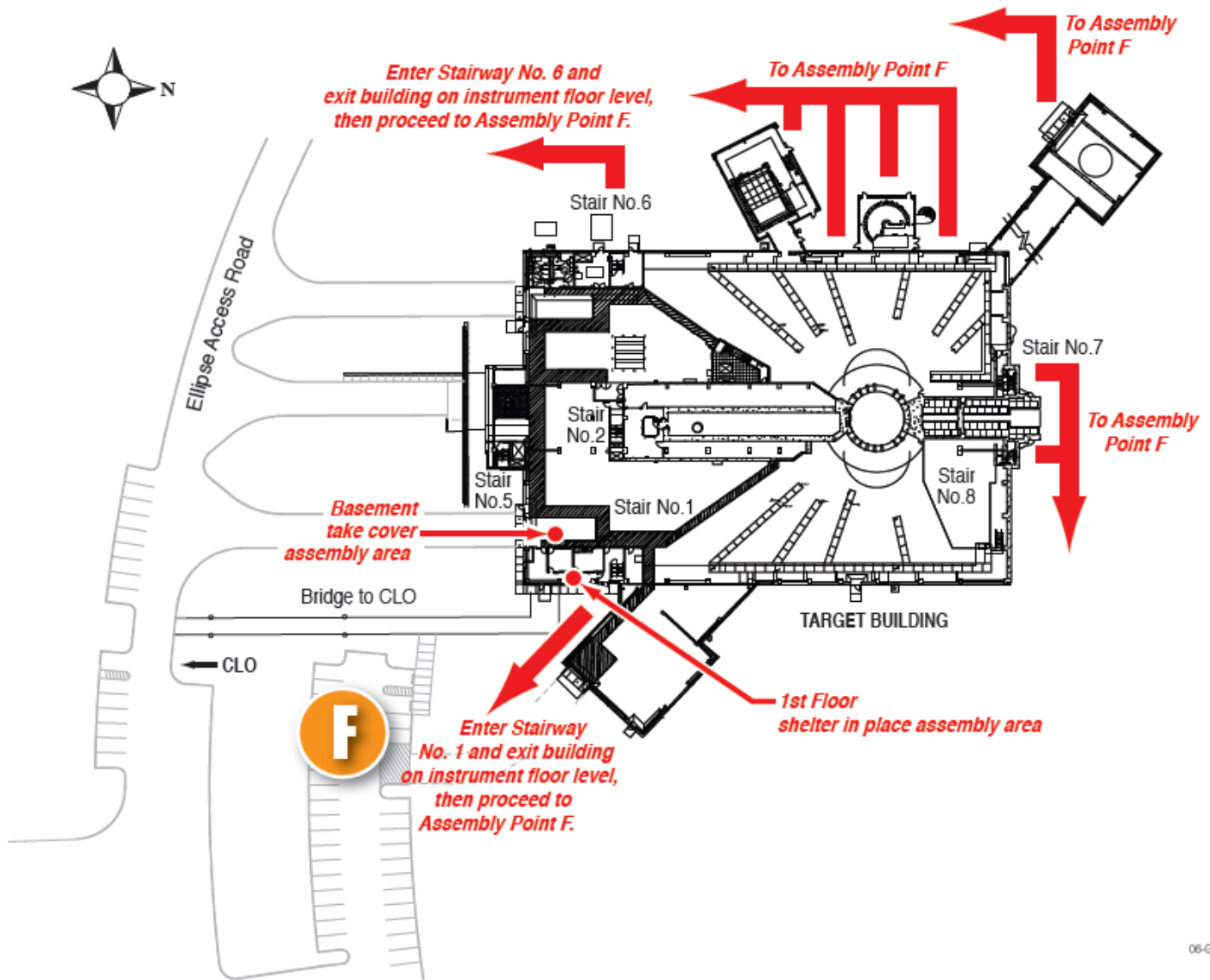
- Alarms should be recorded by the **Instrument Hall Coordinator** in the appropriate log (e.g. SNS Electronic Logbook)

**7 References**

- SNS-OPM 3.A-1.5.4B.1 Procedure for Operation of the Liquids Reflectometer User IPPS Panel  
<https://neutrons.ornl.gov/x/operations/SNS-OPM/03-A-01-05-4B-02.pdf>

**8. Attachment**

- **Target Building Evacuation Map.**



06-G01434B/Rev

