5.U-18.1
Alarm Response at ARCS BL18

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SNS-OPM 5.U-18.1
Alarm Response at ARCS BL18

1. Purpose

This procedure provides responses required to alarms that can be encountered during operation at ARCS.

Acronyms and Definitions:

- CCR Central Control Room
- IPPS Instrument Personnel Protection System
- LSS Laboratory Shift Superintendent
- PST Protection Systems Team
- RCT Radiation Control Technician
- RSO Radiation Safety Officer
- ODH Oxygen Deficiency Hazard

2. Responsibilities

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

2.2 **ARCS Instrument Staff and Users** are responsible for executing the provisions of this procedure.

3. Prerequisites

SNS staff and users must read either SNS-OPM 3.A-1.5.18.1 "Procedure for Staff Operation of the ARCS IPPS System" or SNS-OPM 3.A-1.5.18.2 "Procedure for User Operation of the ARCS IPPS System".

Phone Numbers

Instrument Hall Coordinators:	865-241-4432
Radiation Control Technician:	865-274-8658

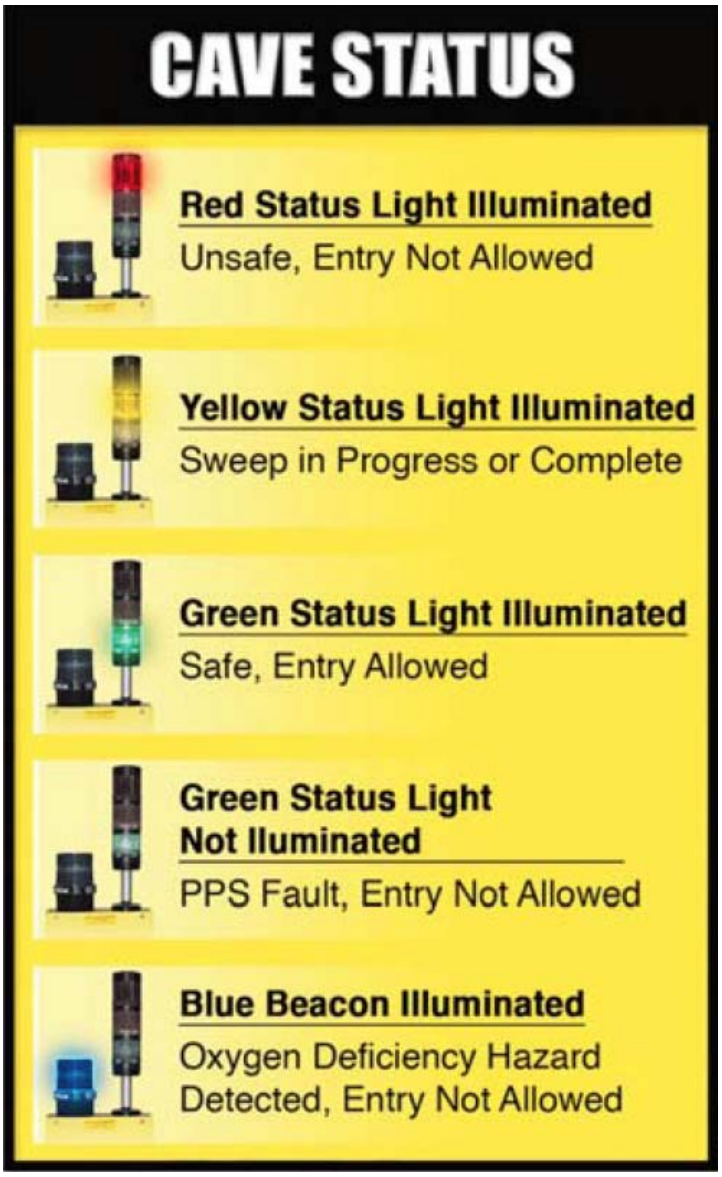
4. Precautions

Alarm conditions at the ARCS beamline and in the SNS Target Building indicate conditions that could present physical hazard. Caution should be exhibited at all times, and adherence to the responses listed here is critical to personnel safety.

Under routine operating conditions, the ARCS detector enclosure will be under vacuum.

5. Procedures

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



Radiation Alarms
Alarm Indication
Magenta beacon is flashing **(>5 mrad/hr)** 
Immediate Action
• Close the shutter • If condition persists, exit the ARCS area • Call Instrument Hall Coordinator (865-241-4432) and RCT (865-274-8658) for assistance • Notify Local Contact
Description
The beacon is illuminated and remains so when the radiation levels at the radiation detector exceed 5 mrad/hr. When a level of 20 mrad/hr is reached, the IPPS will automatically initiate a sequence of events

to reduce the hazard, first to close the shutter, then culminating in tripping the proton beam if the shutter fails to close.

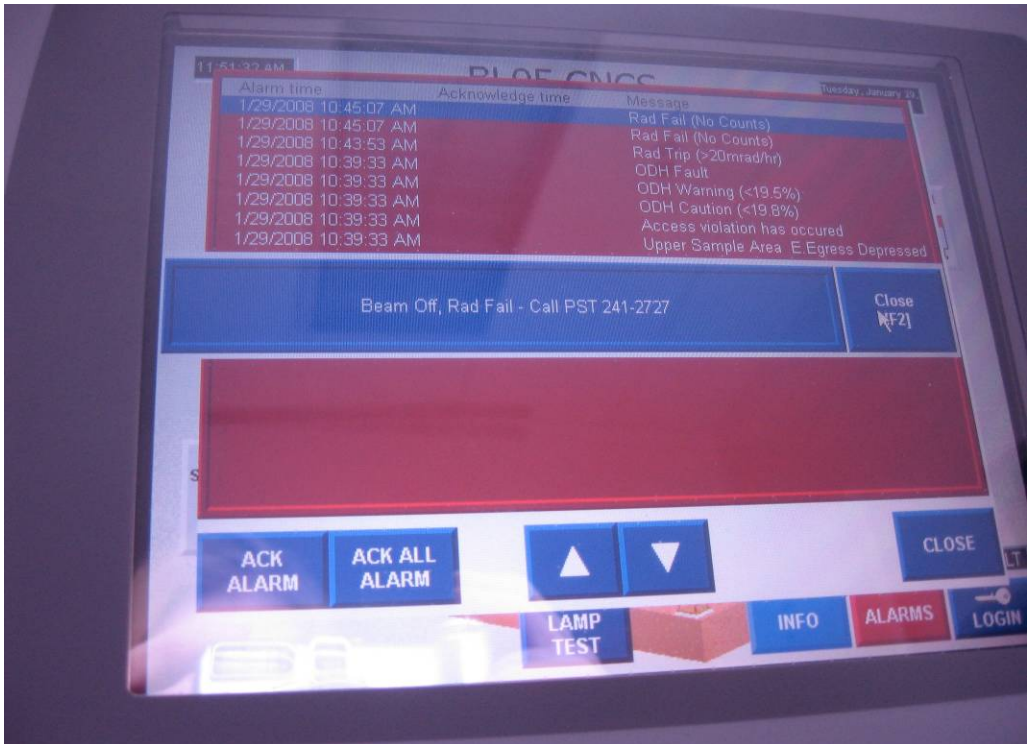
Note: The magenta beacon will take 30 seconds to stop flashing once the trip threshold is crossed, and the hazard has been removed.

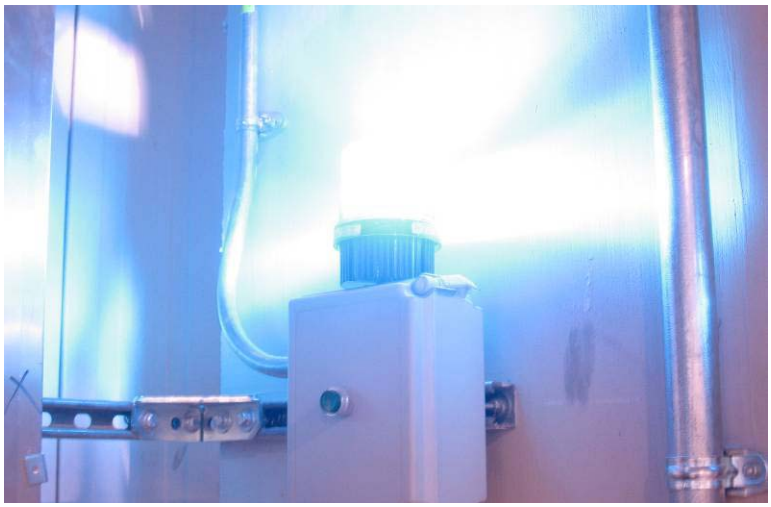
Closing the shutter should remove the elevated radiation level, but if the magenta light still remains illuminated, exit the area and call the Instrument Hall Coordinator (865-241-4432) and an RCT (865-274-8658).

If the magenta light turns off, determine the cause of the elevated radiation. If the cause is unclear or undetermined, call the RCT at 865-274-8658 and request assistance.

Do not attempt to open the shutter until the condition causing the elevated radiation field is corrected. Continued operation will require authorization from the NSSD Operations Manager and the ARCS Lead Instrument Scientist.

The IPPS system will need to be reenabled if the radiation monitor detected radiation levels of 20 mrad/hr or greater. The IPPS system may be reenabled by an instrument hall coordinator.

Alarm Indication
Message Display Reads “Beam Off, Rad Fail Call RCT 274-8658” 
Immediate Action
• Call the RCT (865-274-8658) to report the problem • Call the IHC (865-241-4432) to report the problem.
Description
The radiation detector has failed and requires maintenance by a member of the Protection Systems Team. Call the indicated number and report the problem. The IPPS will *attempt* to close the shutter removing the potential hazard (and if that fails the proton beam will be tripped). Do not attempt to open the shutter until the condition causing the radiation monitor to fail is corrected, and granted approval by the Protection Systems Team Leader or designee.

Oxygen Deficiency Hazard Alarms
Alarm Indication
Blue strobes flashing and audible alarm (loud horn). 
Immediate Action
• **Exit the area immediately if inside and do not attempt to enter if outside.** • Call the **Instrument Hall Coordinator** (865-241-4432) to inform them of an ODH event. • Horn may be silenced by depressing **alarm acknowledge** button on ODH display once all personnel have exited the instrument enclosure.
Description
This condition is caused by an oxygen deficiency hazard inside the ARCS Sample Room and/or ARCS Basement (ODH cutoff set point is 19.5% O_2; a normal O_2 level is about 21%). The actual O_2 concentration will be displayed on the O_2 display. ***NOTE:*** ***Horn may be silenced by depressing alarm acknowledge button on the local ODH display.***

Alarm Indication
 
Stack Lights not illuminated Message display reads "02 Detector Fail Call PST 241-2727" and (depending on failure mode) blue strobes flashing	**Stack Lights not illuminated and (depending on failure mode) blue strobe flashing Audible alarm sounding**
Indication may be present on either the Sample Room or Basement Enclosure ODH Stack Lights
Immediate Action

- **Leave the ARCS Sample Room and/or Basement immediately if inside or do not attempt to enter the area if outside.**
- Call the Instrument Hall Coordinator (865-241-4432) to report the "O_2 detector fail" message.
- Horn may be silenced by depressing **alarm acknowledge** button on ODH display.
- Turn off neutron beam by closing the shutter. Do not resume instrument operation until the condition causing this error is corrected.

Description

This condition is caused by a failure of the oxygen monitoring system. This failure needs to be corrected before normal beam operation can resume. Maintenance and repair of the oxygen monitoring system is governed by internal work control procedures maintained by the Protection Systems Team. When the system has been repaired, the Protection Systems team will notify Instrument personnel and the Instrument Hall Coordinators.

Alarm Indication
Unusual/Questionable vacuum system behavior/sound
Immediate Action
• In the case of immediate danger to personnel, facility, or equipment press the e-stop button located either on the control panel in the instrument hutch or on the electrical cabinet located in the instrument pit. • Call Instrument Hall Coordinator (865-241-4432) to report the unusual behavior of the vacuum system. • Notify Local Contact.
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.

6. Documentation

- None

7. References

- SNS-OPM 3.A-1.5.18.1, Procedure for Staff Operation of ARCS IPPS SYSTEM
- SNS-OPM 3.A-1.5.18.2, Procedure for User Operation of ARCS IPPS SYSTEM
- ORNL SBMS Procedure: Responding to an Emergency
- https://sbms.ornl.gov/sbms/sbmsearch/subjarea/EmerPrepResponse/pro4.cfm

8. Attachments

Target Facility Evacuation Map