

Brookhaven National Laboratory/National Synchrotron Light Source				
Subject:	Response to “WORKDAY & HOURLY RADIATION ALARMS” - Channel 26			
Number:	LS-ESH-0034	Revision:	C	Effective: 3/13/2008
				Page 1 of 7

The only official copy of this file is the one on-line in the NSLS Quality Assurance website. Before using a printed copy, verify that it is the most current version by checking the document effective date on the NSLS QA website.

Prepared By: M. Buckley	Reviewed By: F. Zafonte	Approved By: E. Zitvogel	Approved By: A. Ackerman
-------------------------	-------------------------	--------------------------	--------------------------

*Approval signatures on file with master copy.

[Revision Log](#)

1.0 PURPOSE

The purpose of these instructions is to provide the Operations Group personnel with guidance to responding to radiation level alarms associated with the Radiation Monitor Micro and chipmunk monitors listed on channel 26.

2.0 SCOPE

The NSLS policies on radiation limits must be enforced during machine operations to comply with NSLS ALARA policies. This applies to all study, conditioning and operation periods. The area radiation action levels are listed in table [1](#) and [2](#) within this procedure and are programmed into the automated radiation monitoring system.

The NSLS Operations Group mentioned in this document refers only to the Machine Operators and Operations Coordinators.

3.0 RESPONSIBILITY

Machine Operator: The on-duty Machine Operator is responsible for monitoring radiation levels during injection periods and ring operations and to respond to alarms and the radiation level read outs as described in this document. All alarms received must be recorded in the Machine Operator’s Log.

In the event the RAD MON micro is not functioning, the operator must call the appropriate responsible individual to restart the micro. If the micro is down for more than 1-hour when there is stored beam in the X-ray or VUV ring, the NSLS Safety Officer or Designee must be notified. If the micro is down in any other situation, injection/operations must stop and may not continue until the micro is up and running or approval by an authorized individual listed on [LS-ESH-0034A](#).

Operations Coordinator: The Operations Coordinator must monitor the radiation levels and be aware of the radiation levels when available to do so. The OPCO must respond to the Machine Operators request to investigate an area that may be reaching an established area radiation monitor action level and to follow the instructions/requirements stated within this document.

NSLS ALARA Committee: The NSLS ALARA committee is responsible for determining the action levels in table 1.

Subject:	Response to “WORKDAY & HOURLY RADIATION ALARMS” - Channel 26		
Number:	LS-ESH-0034	Revision:	C
		Effective:	3/13/2008
			Page 2 of 7

4.0 ALARM PAGE OVERVIEW

The chipmunk monitors are connected to the radiation monitor micro. The alarms generated are displayed on the main alarm system in the NSLS control room through a dedicated video monitor. An audible alarm will sound with each new alarm that is displayed.

The “Workday & Hourly Radiation” alarm page on channel 26 contains three columns of information. The *first column “Radiation Monitor”* on this alarm page indicates the radiation monitor (chipmunk) location. The alarm page display is determined by the NSLS ES&H Group and will only be changed with the group’s approval.

The *second column “Wday Tot”* indicates the total radiation (in mRem) accumulated between 0830 hr and 1700 hr during normal workdays (Monday to Friday, regardless of holidays). This data will remain on the screen until 0830 hr the next day when the column of data is automatically reset.

The *third column “Hour Tot”* indicates the total radiation (in mRem) accumulated within one hour of the present time. An explanation of how the data in this column can be read is as follows:

The hourly totals in the “Hour Tot” column are updated every 30 seconds and show the total radiation accumulated during the previous 60 minutes. For example:

- At 1300 hr the reading will be the total radiation accumulated between 1200 hr & 1300 hr.
- At 1301 hr the reading will be the total radiation accumulated between 1201 hr & 1301 hr.

The alarms for this system are set to the parameters listed in the Response Matrix on table [1](#) and [2](#). All alarm conditions that appear on channel 26 will also generate an audio/visual alarm on the NSLS Alarm System in the NSLS Control Room. An alarm condition will also be displayed in yellow or red, depending on the level of radiation and the time period (See table below).

Time Period	Alarm Condition	
Workday	1 mrem	4 mrem
Hourly	2 mrem	5 mrem

Subject:	Response to “WORKDAY & HOURLY RADIATION ALARMS” - Channel 26				
Number:	LS-ESH-0034	Revision:	C	Effective: 3/13/2008	Page 3 of 7

5.0 RESPONSE TO ALARMS

The matrix below is a guide for the Operations Group to follow while monitoring radiation levels on channel 26. This guide provides information needed for a proper response to increased levels of radiation at these monitored areas.

Each alarm condition/level includes a separate operations group response. When required, the authorization list ([LS-ESH-0034A](#)) is to be utilized for obtaining permission to exceed an area radiation monitor action level.

To avoid reaching radiation area radiation monitor action level, the Control Room Operator should reduce the radiation delivered by limiting beam-on time or reducing current. If an area radiation monitor action level has been reached, the Operator must follow the instructions indicated on the response matrix.

Subject:	Response to “WORKDAY & HOURLY RADIATION ALARMS” - Channel 26			
Number:	LS-ESH-0034	Revision:	C	Effective: 3/13/2008
				Page 4 of 7

TABLE 1: Office Area Radiation Monitoring (includes areas listed in [Table 3](#)):

	During TIME PERIOD	Area RADIATION Monitor Action Level	<u>OPERATIONS GROUP RESPONSE</u> If Area Radiation Monitor Action Level Is Approached or Reached	Guidelines for Requesting Permission to Exceed Area Radiation Monitor Action Level
1	0830-1700 hr. Normal Workday	1.0 mrem Total accumulated during 8½ hr period	1.) Contact NSLS Safety Officer or authorized individual listed on LS-ESH-0034A . Continue monitoring levels.	NSLS operator may continue with injection once the NSLS Safety Officer or authorized individual listed on LS-ESH-0034A is notified. (A phone message or email is acceptable)
2	0830-1700 hr. Normal Workday	4.0 mrem Total accumulated during 8½ hr period	1.) Stop injection and turn off the gun pulse. 2.) Contact NSLS Safety Officer or authorized individual listed on LS-ESH-0034A . 3.) Personnel in the offices of the areas affected must be advised of the elevated levels and are required to wear a radiation badge. Persons not wearing a radiation badge must leave the area. a.) Area must be rechecked every hour for the remainder of the business day if injection continues to assure that all personnel are advised.	Permission must be granted by an authorized NSLS individual listed on attachment LS-ESH-0034A .
3	ALL TIMES	2.0 mrem in any hour	1.) Stop injection and turn off the gun pulse 2.) Personnel in the offices of the areas affected must be advised of the elevated levels and are required to wear a radiation badge. Persons not wearing a radiation badge must leave the area. Enter the tour information in operations log. a.) Area must be rechecked every hour as long as this condition continues to assure that all personnel are advised.	Injection may continue after the Operations Group complies with the response requirements for this level. Notify NSLS Safety Officer. (A phone message or email is acceptable)
4	ALL TIMES	5.0 mrem in any hour	1.) Stop injection process affecting this area and contact NSLS Safety Officer or authorized individual listed on LS-ESH-0034A 2.) Areas that exceed 5.0 mrem/hr become radiation areas and must be posted by an Radiological Control Division (RCD) Facility Support if operations are approved to continue.	1.) Continued operation is not permitted without permission by the NSLS Chairman, ESH&Q Manager, or Deputy Chairman. 2.) Permission for such operation should not be expected on short notice.

The decision to require personnel to leave office areas due to increased radiation levels must be made by an authorized NSLS individual listed on LS-ESH-0034A. Proper postings and barriers must also be placed in these areas upon carrying out this decision.

Subject:	Response to “WORKDAY & HOURLY RADIATION ALARMS” - Channel 26			
Number:	LS-ESH-0034	Revision:	C	Effective: 3/13/2008
				Page 5 of 7

TABLE 2: X-Ray Tunnel Crossover Area

	During TIME PERIOD	Area RADIATION Monitor Action Level	OPERATIONS GROUP RESPONSE If Area Radiation Monitor Action Level Is Approached or Reached	Guidelines for Exceeding Area Radiation Monitor Action Level
1	All Times	4.0 mrem in any hour	<p>1.) The crossover area shall be posted as a radiation area. (Refer to Appendix for reference photos)</p> <p>a. <u>Posting (Normal working hours)</u>: Contact RCD Facility Support during normal working hours for posting.</p> <p>b. <u>Posting (Off Hours)</u>: NSLS Operations Group may post area during off hours.</p> <p>c. <u>Down Posting (Normal Working Hours)</u>: 1.) Only RCD Facility Support may Down Post an Area.</p> <p>d. <u>Down Posting (Off Hours)</u>: Operations Group may down post an area when: 1.) <i>Stored Beam in machine</i> – Contact RCD Facility Support for permission to down post. 2.) <i>No Stored Beam in Machine</i> – Verify there is NO Beam in Machine and verify area monitors is < 5 mR/hr. <u>Notify RCD Facility Support of action taken via email.</u></p> <p>Note: All actions must be documented in operations log.</p>	1.) Assure area is posted.
2	ALL TIMES	5.0 mrem in any hour	1.) Notify NSLS Safety Officer (If during off hour, notify next normal workday). Continue monitoring levels.	1.) Assure area is posted.
3	ALL TIMES	10.0 mrem in any hour	1.) Stop injection and contact NSLS Safety Officer or authorized individual listed on LS-ESH-0034A .	<p>1.) Continued operation is not permitted without permission by the NSLS Chairman, ESH&Q Manager, or Deputy Chairman.</p> <p>2.) Permission for such operation should not be expected on short notice.</p>

Subject:	Response to "WORKDAY & HOURLY RADIATION ALARMS" - Channel 26		
Number:	LS-ESH-0034	Revision:	C
		Effective:	3/13/2008
			Page 6 of 7

TABLE 3: Office Area Chipmunk Locations

Comp rm (2-101)	2-101NE
Room 2-103 in B wing	2-103
Room 2-148 in C wing	2-148
Room 2-112	2-112
Room 2-123	2-123
Vuv wall near 2-140B	UEWALL-S
Vuv wall near 2-144	UEWALL-N
X-ray tunnel walkover	XTWALKO

APPENDIX:**Figure 1: X-Ray Ring Crossover Posting (Outer ring)****Figure 2: X-Ray Ring Crossover Posting (inner ring)**

The only official copy of this file is the one on-line in the NSLS Quality Assurance website.

Before using a printed copy, verify that it is the most current version by checking the document effective date on the NSLS QA website.

Subject:	Response to “WORKDAY & HOURLY RADIATION ALARMS” - Channel 26		
Number:	LS-ESH-0034	Revision:	C
		Effective:	3/13/2008
			Page 7 of 7

Document Review Frequency

2 Years

Review signatures on file
with master copy of
controlled document

NLS REVISION LOG

Document Number:	LS-ESH-0034	
Subject:	Response to “Workday & Hourly Radiation Alarms” – Channel 26	
Rev	Description	Date
A	<ol style="list-style-type: none"> 1. This document was developed originally under document number LS-SAF-0004. The “SAF” group code is gradually being phased out and replaced with the “ESH” group code. 2. The response matrix has been modified where the “During Time Period” & “Area” column was removed. 3. The response has changed for several of the conditions and text was modified in section 5 to correspond with the changes in the matrix. 4. A new requirement was added to address the steps needed when the RAD MON micro is not functioning. 5. The reference to LS-SAF-0004A has been removed and replaced with LS-ESH-0034A. 6. The Title of the document has changed slightly where “Operations Group Response to” has been removed. This information is already defined in the purpose section of the procedure. 	3/1/04
B	<ol style="list-style-type: none"> 1. Changed term “Administrative Control Level” to “Monitor Action Level”. 2. Added matrix and response information for X-Ray crossover. 3. Eliminated unneeded wording in original matrix for response to alarms. 4. Added a list of chipmunks locations for office areas. 	1/18/2008
C	<ol style="list-style-type: none"> 1. Removed numerous sentences and reworded some to clarify requirements and eliminate redundancy. 2. Modified table 1 for clarification of operations group response and guidelines for requesting permission to exceed. 3. Modified table 2 to allow operations group to down post areas during off hours and when there is no stored beam. This permission was provided by the BNL Radiological Control Group. 	3/13/2008