Form : HPF-OSP-002 Revision: 6 Date: 12/1/2009	***JEFFERSON LAB*** Radiation Work Permit	Applicable to procedure: HPP-OSP-001 Page 1 of __4__

Serial Number: 2014-G001	Start Date: 01-1-2014	Expiration Date: 12-31-2014

Work Area/Description of Work

CEBAF Accelerator tunnel, Hall-A, Hall-B, Hall-C, Hall D proper/tagger, Free Electron Laser vault and associated service buildings/areas.

Beam enclosure areas addressed by this RWP are normally designated and posted as Radiologically Controlled Areas (RCA) and Radioactive Material Areas (RMA) when accessible, except as noted in any special instructions.

Other radiological conditions and postings may be present in the enclosure, including Radiation Areas, High Radiation Areas, Contamination Areas, and Airborne Radioactivity Areas.

Access to these areas requires concurrence of the Radiation Control Department (RCD), at a minimum. Additional controls may be required.

An accelerator beam enclosure is any area where accelerator beams may be present. This RWP applies **only** to work in these areas during routine access conditions. It shall not limit the access of emergency personnel in the event of an accelerator emergency requiring access.

****The LINAC, Arc and BSY service buildings, with the exception of the injector, E1, W1 and W2 buildings, are designated as Radiation Areas when CEBAF is in Beam Permit. Convertible "flip signs" at access points to these buildings will be flipped to display the Radiation Area posting when the machine is in beam permit. All work in these areas during beam operations will be governed by Standing RWP 2014-S015. When posted as Radiation Areas, contact the Crew Chief for access to these areas.***

Task Description

Perform general maintenance, equipment installation/removal, testing, walk-through, and inspections. This RWP shall be the radiological work control document for all work in beam enclosures that is not specifically addressed by a Job-Specific or Standing RWP.

Work Area Radiological Conditions

__*__ Radiation Levels
Maximum_____
Contact_____
Whole Body_____

__*__ Contamination Levels
Maximum_____
Location_____

__*__ Airborne
Maximum_____
Location_____

__*__ Other_____

*** For radiological survey data, refer to the survey maps located in the MCC and postings at access points.**

ALARA Estimate (whole body dose rate is an estimate of "average" conditions)

__**__ (Total Man-hours) X __**__ (Whole Body Exposure Rate) = __**__ Man-mrem

** Expected cumulative dose is less than 1 person-rem

Training Requirements for Entry under this RWP

__X__ Radiation Worker I __*__ Radiation Worker II ___ Respirator Qualified

*** Also see more instructions on additional pages**

__X*__ Dosimeter __*__ SRPD

*** Also see more instructions on additional pages**

__*__ Multiple Dosimetry (as specified below):

__*__ Extremity Dosimetry(as specified below):

Protective Clothing Requirements

____Full Protective Clothing (coveralls, booties, overshoes, cotton liners, rubber gloves, hood)

____Partial protective clothing (as specified below):

____Special protective clothing (as specified below):

_____Respiratory equipment (as specified below):

Radiological Controls Coverage Requirements

____Continuous ____Intermittent __*X*__ None

General Instructions

__**__Dose Tracking required* __**__Pre-job briefing required __X__Other (as specified below)

1) **Do not** enter any area posted "Radiation Area" unless authorized on the posting (i.e. "Walk thru permitted") or by the RCD.
2) **Do not** enter any area posted "High Radiation Area" or "Contamination Area".
3) **Do not** enter any area posted "Airborne Radioactivity Area" unless specifically authorized on the posting.
4) **Do not** cut, drill, grind, or weld on any beamline components (girders, supports, stands, etc.) without approval from the RCD.
5) **Do not** drain or open any liquid system, or open any device or system labeled "Potential Internal Contamination" or "Internal contamination" without RCD approval.
6) The following locations or systems shall be considered potentially contaminated **(regardless of labeling)** and require notification of RCD prior to opening or entry.
   a) Any cooling water system associated with components which absorb part of the beam's energy (to include LCW piping and components housed in above ground service buildings; i.e. North and South Access and Building 92).
   b) Any air conditioning (HVAC) system which transports ambient air in a beam enclosure (see exceptions on the continuation form). Filter media, condensate and lubricants from any such system are to be treated as contaminated and handled only by appropriately trained workers.
   c) Beam enclosure floor drains, related piping, sumps, pumps and discharge locations.
   d) Mechanical vacuum pumps associated with the primary beam vacuum chamber or cryogenic targets.
   e) Target assemblies, or any other component on which the primary beam is directed.

**** SEE CONTINUATION FORM FOR ADDITIONAL INSTRUCTIONS**

***RCM approval required for any worker with an incomplete current year's dose record.**

Waste Production and Disposal: Routine (Y)/ N

Description Beamline hardware and diagnostic equipment, infrastructure, cabling, supports, conduit, piping, fasteners, rubble and general debris.

Approx. amount expected 1500 lbs. 200 cu. ft.

Characteristics:
___ Oily
_X_ Bulk liquids[1]
_X_ Lead
[1] Vac pump oil

___ > 1 M dpm
_X_ H^3
___ Metal > 250 mR/hr
___ Mixed*
*Requires RCM notification

Radiological Conditions that may void this RWP: **See additional instructions**

Approvals:
Submitted by: _____ / 11/25/13
RCD Date
Work Supervisor N/A / _____
Date

Approved by RCM _____ / 11/26/13
Date

Cancellation:
This RWP is cancelled as of _____ by _____
Date

RWP Number: 2014-G001	**Effective Date: 1-1-2014**
Date	Comments
1-1-14	7) All material located in a beam enclosure during beam operation must be monitored for radioactivity upon removal from the enclosure (see exceptions below). An Assigned Radiation Monitor (ARM) may survey items for removal from the enclosure; i.e., to make accessible for release survey, but such items will be considered radioactive until released by an RCT and must remain in a Radioactive Material Area * ***Only a qualified Radiological Control Technologist (RCT) may approve the release of materials as non-radioactive.***
	8) The movement of Radioactive materials from one location to another ***ALWAYS*** requires RadCon approval prior to movement.
	9) Notify RCD prior to removing any beamline component from its installed location. This applies to the beamline proper, beamline diagnostic equipment, girders and their components, support stands and any associated shielding. ***All such work requires pre-planning via ATLis.*** (This includes target and dump work).
	10) **C100 cryomodule operation, i.e., High power RF testing in Power Permit, is considered equivalent to "beam operation" within the beam enclosure. Tools and equipment left in the affected zones of the North or South Linac during commissioning have the potential to become activated. Any item brought into a Linac tunnel must be surveyed prior to removal if RF operations have occurred since the item was brought in. If RF operational history is not known, such items must be surveyed.**
	11) All stored radioactive material is the responsibility of the radioactive materials custodian assigned to the system or work area.
	12) No eating, drinking or smoking is permitted in beam enclosures.
	13) This RWP does not apply to visitors. Visitors must be escorted at all times while in an RCA by a trained Radiation Worker, and must obtain the appropriate dosimetry from the RCD. ***Visitors may not enter ANY area posted beyond the level of RCA (i.e., Radiation Area).***
	14) Upon completion of beam operations, a radiation survey of the enclosure must be performed prior to allowing general access as it applies to this RWP. (See specific requirements below).
	15) Any **"hands-on"** work directly on a posted Hot Spot shall be approved by RCD in advance.
	16) Do not alter any installed shielding bearing a "Controlled Shielding Configuration" label without specific approval from the RCD.
	17) Radioactive material which causes a Radiation Area, or which has surface contamination in excess of applicable control limits, shall not be stored outdoors without specific concurrence from the RadCon Manager and the Hall Leader/Operability Manager, as applicable.
	18) Any scrap metal residing in a radiological area (Radiation, High Radiation, Contamination Area), that has been cleared as non-radioactive, **shall not** be released for commercial recycling.
	RAPID ACCESS ENTRY
	Automated "rapid access" monitoring systems ***(currently installed in the CEBAF Injector, Hall B and the FEL)*** may be used under certain conditions. Rapid Access entry is permitted under **Controlled Access only**. The following requirements apply:
	1) The magenta beacon at the entry door must be OFF before entry. A radiation survey is required, otherwise.
	2) The system shall be tested during initial entry (by pressing a test switch and verifying beacon operation) under direction of the Personnel Safety System Operator (SSO).
	3) When entering via rapid access protocol, no access beyond established boundaries in these areas is permitted without a specific survey of the area.
	4) When entering any area via rapid access protocol, no hands-on work on beam lines or targets is permitted without a survey of the affected area*.
	5) A full radiation survey must be performed to change to Restricted Access*.
	* *Survey requirements in (4) and (5) above do not apply to the CEBAF injector segment.*
	END STATIONS
	Any cryogenic target system which contains or may have contained He-3 shall be considered "potentially internally contaminated". Do not open, vent, or modify any such target system without RCD approval.

RWP Number: 2014-G001	**Effective Date: 1-1-2014**
Date	Comments
1-1-14	**HALLS A and C**
	Certain components and spaces are subject to a buildup of low-level contamination. Examples include the interior of equipment racks, ventilated electronic components such as computer CPUs, power supplies, all ventilation fans and ductwork, and devices that may electrostatically collect dust from the air (including CRT monitors and photomultiplier tubes).
	The following tasks require RCD approval (and may require RW-II and additional PPE):
	a) Handling, cleaning or removing filter media housed in this equipment.
	b) Large-scale cleaning of this equipment such as component wipe-down, vacuuming, or any use of compressed air for cleaning.
	c) Maintenance or repairs performed in rack spaces (i.e. disassembly or removal of components).
	d) Any work that may disturb visible dust build-up on equipment or components.
	- ***PPE for the above tasks, gloves (regardless of contamination levels) – at a minimum.***
	Non-invasive work in or on this equipment (i.e. flipping a switch, connecting cables) does not require notification of the RCD, unless otherwise indicated by postings.
	All such equipment must be assessed for contamination by the RCD prior to release from control.
	*****The above controls may be modified based on assessments by RCD*****
	HALL B
	Air handling (HVAC) systems in Hall B are not subject to the contamination controls described in Section 6(b).
	HALL D
	1) For this GARWP period, Hall D will be brought online. The Tagger area and portions of the hall
	proper are scheduled to receive beam in mid-March and late 2014 respectively.
	2) Air handling (HVAC) systems in Hall D/tagger areas will be continuously assessed during commissioning to determine the need for any specific radiological controls.
	FREE ELECTRON LASER
	1) Laser diagnostic equipment (i.e., power meters) used both in the FEL vault and drive laser room may be moved between these areas provided it is surveyed by an ARM prior to removal from the vault and found to have no detectable radioactivity.
	2) Air handling (HVAC) systems in the FEL vault are not subject to the contamination controls described in General Instructions Section item 6(b).
	**At present, the FEL is in a "non-active" status; however, the above required controls remain in effect.*
	The radiological posting level of Hall B and the FEL are normally "Radiologically Controlled Area". If radiological conditions allow, the posting level may be reduced to "Controlled Area" (dosimetry not required). "Radioactive Material Area" designation and survey requirements listed above apply at all times. *****Always check the local postings prior to entry*****
	CEBAF INJECTOR
	1) When accessible, the injector area (gun area up to the North Linac gate) is posted as a Radiologically Controlled Area, Dosimetry Required; however, it is not considered a Radioactive Material Area. Items that are known or suspected of being activated may not be stored in this area.
	2) Items which have resided exclusively within the injector segment may be removed without a radiological survey.
	**** If there is any question as to the confidence of this process knowledge, a survey shall be requested.***
	3) Surveys are not required to take the CEBAF injector to "Restricted Access" when the Rapid Access System is functional.
	Note: "Beamline" means primary electron beam vacuum chamber and any other envelope in which the primary electron beam is contained.
	Any questions regarding implementation of this permit should be directed to RadCon at 876-1743, 876-5342 or 273-5452. The Accelerator Crew Chief can be reached at 269-7045 or 630-7050.

Click here when you have read and understand this document