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| Form : HPF-OSP-002<br>Revision: 6<br>Date: 12/1/2009 | <b>JEFFERSON LAB</b><br>Radiological Work Permit | Applicable to procedure:<br>HPP-OSP-001<br>Page 1 of 4 |
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| Serial Number: 2013-G001 | Start Date: 01-1-2013 | Expiration Date: 12-31-2013 |
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**Work Area/Description of Work:**

CEBAF Accelerator tunnel, Hall-A, Hall-B, Hall-C, 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 when accessible, except as noted in the 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 at minimum concurrence of the Radiation Control Department, and may require additional controls.*

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.

**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 which is not specifically addressed by a Job-Specific or Standing RWP.

**Work Area Radiological Conditions:**

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|--|---|---|
| * Radiation Levels<br>Maximum _____<br>Contact _____<br>Whole Body _____ | * Contamination Levels<br>Maximum _____<br>Location _____ | * Airborne<br>Maximum _____<br>Location _____ |
|--|---|---|

\* Other \_\_\_\_\_

**\* See survey maps in Machine Operations Control Center and posted at access points for radiological survey data. See continuation sheet for further information and limitations.**

**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 less than 1 person-rem**

**Training Requirements for Entry on this RWP:**

Radiation Worker I     Radiation Worker II     Respirator Qualified

**\* Also see special instructions**

Dosimeter     SRPD

**\* Also see special instructions**

\_\_\_\* Multiple Dosimetry (as specified below):

\_\_\_\* Extremity Dosimetry( as specified below):



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| Form : HPF-OSP-005<br>Revision: 6<br>Date: 12/1/09 | <b>JEFFERSON LAB</b><br>Radiation Work Permit<br>Continuation Form | Applicable to procedure:<br>HPP-OSP-001<br>Page: <u>3</u> of <u>4</u> |
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| <b>RWP Number: 2013-G001</b> | <b>Effective Date: 1-1-2012</b> |
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| Date   | Comments   |
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|        | <b>GENERAL INSTRUCTIONS – Continued from Page 2</b>  |
| 1-1-13 | 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.<br><br><i>Only a qualified Radiological Control Technologist (RCT) may approve the release of materials as non-radioactive.</i> |
|        | 8) 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. <b>All such work requires pre-planning via ATLis.</b> (This includes target and dump work).   |
|        | 9) All stored radioactive material is the responsibility of the radioactive materials custodian applicable to the system or work area.   |
|        | 10) No eating, drinking or smoking is permitted in beam enclosures.  |
|        | 11) 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 RCD. <b>Visitors may not enter ANY area posted beyond the level of RCA (i.e. Radiation Area).</b>  |
|        | 12) Upon cessation of beam operations, a radiation survey of the enclosure must be performed prior to allowing general access applicable to this RWP. See specific requirements below.   |
|        | 13) Any <b>“hands-on”</b> work directly on a posted Hot Spot shall be approved by RCD in advance.  |
|        | 14) Radiological surveys are required after RF operation of any C-100 cryomodule.  |
|        | 15) Do not alter any installed shielding bearing a “Controlled Shielding Configuration” label without specific approval from RCD.  |
|        | 16) Radioactive material which causes the presence of a Radiation Area, or which has surface contamination in excess of applicable control limits shall not be stored out of doors without specific concurrence from the RadCon Manager and the Hall Leader/Operability Manager, as applicable.  |
|        | 17) Any scrap metal that resided in a radiological area (Radiation, High Radiation, Contamination Area), and has been cleared non-radioactive, <b>shall not</b> be released for commercial recycling.  |
|        | <b>SPECIAL INSTRUCTIONS</b>  |
|        | <b>RAPID ACCESS ENTRY</b>  |
|        | Automated, “rapid access” monitoring systems ( <i>currently installed in the CEBAF Injector and the FEL</i> ) may be used under certain conditions. Rapid Access entry is permitted under <b>Controlled Access only</b> . The following requirements apply:  |
|        | 1) The magenta beacon at the entry door must be OFF for entry. If not, a radiation survey is required.   |
|        | 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*.  |
|        | <b>5) A full radiation survey must be performed to change to Restricted Access*.</b>   |
|        | * Survey requirements in (4) and (5) above do not apply to the CEBAF injector segment.   |
|        | <b>END STATIONS</b>  |
|        | 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.   |

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| Form : HPF-OSP-005<br>Revision: 6<br>Date: 12/1/09 | <b>JEFFERSON LAB</b><br>Radiation Work Permit<br>Continuation Form | Applicable to procedure:<br>HPP-OSP-001<br>Page: 4 of 4 |
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|------------------------------|---------------------------------|
| <b>RWP Number: 2013-G001</b> | <b>Effective Date: 1-1-2013</b> |
|------------------------------|---------------------------------|

| Date   | Comments  |
|--------|---|
| 1-1-13 | <b><u>SPECIAL INSTRUCTIONS</u></b> – Continued from Page 3  |
|        | <b>HALLS A and C</b>  |
|        | 1) 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, etc., all ventilation fans and ductwork, and devices that may electrostatically collect dust from the air (including CRT monitors and photomultiplier tubes). |
|        | <b><i>The following tasks require RCD approval (and may require RW-II, and additional PPE):</i></b>   |
|        | 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   |
|        | <b><i>- Minimum PPE for the above tasks is gloves, regardless of contamination levels.</i></b>  |
|        | 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 posting.  |
|        | All such equipment must be assessed for contamination by the RCD prior to release from control.   |
|        | <b><i>**The above controls may be modified based on assessments by RCD**</i></b>  |
|        | <b>HALL B</b>   |
|        | 1) Air handling (HVAC) systems in hall B are not subject to the contamination controls described in the general instructions.   |
|        | 2) <b>For the 12 GeV accelerator shutdown, all material and experimental equipment which has been present in the hall during beam operations must be assessed by RadCon prior to release from the hall. This assessment may include process knowledge evaluation, sampling and surveys.</b>   |
|        | <b>HALL D</b>   |
|        | <i>For this GARWP period, Hall D is not considered a beam enclosure. However, there may be radiological postings in various areas that must be adhered to.</i>  |
|        | <b>FREE ELECTRON LASER</b>  |
|        | 1) Laser diagnostic equipment (i.e. power meters, etc.) 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 the general instructions.  |
|        | The radiological posting level of Hall B and 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 above apply at all times. <b><i>**Always check the local postings prior to entry**</i></b>    |
|        | <b>CEBAF INJECTOR</b>   |
|        | 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.   |
|        | <b><i>*If there is any question as to the confidence of this process knowledge, a survey shall be requested.</i></b>  |
|        | 3) Surveys are not required to take 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.   |
|        | <b>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.</b>   |

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