

Ownership matrix	RPP-27195
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1.0 PURPOSE AND SCOPE

This procedure describes the process for implementing the External Dosimetry Program. It specifically explains the process used to measure and monitor individual exposures to external radiation.

This procedure applies to all personnel who require access to Washington River Protection Solutions, LLC (WRPS) radiological areas, the managers of these personnel, and to radiological control personnel responsible for personnel dosimetry.

2.0 IMPLEMENTATION

This procedure is effective on the date shown in the header.

3.0 RESPONSIBILITIES

Responsibilities are contained within Section 4.0.

4.0 PROCEDURE (7.1.1)

4.1 Basic Requirements

Individuals who do NOT enter Radiologically Controlled Areas (RCAs) do not require dosimeters. Area dosimeters are used to verify that these individuals are not obtaining any radiation exposure above the threshold where dosimetry is required. Exceptions must be approved by the CTA on an individual basis.

1. Primary dosimetry (Hanford Standard Dosimeter [HSD]) is required and should only be issued to those individuals likely to receive occupation radiation exposure:
 - All personnel if they are expected to receive doses greater than:
 - 100 mrem annual effective dose
 - 5 rem per year equivalent dose to the skin
 - 5 rem per year equivalent dose to the extremities, or
 - 1.5 rem per year equivalent dose to the lens of the eye.
 - All personnel entering a high or very high radiation area (HRA/VHRA).
 - All personnel entering a radiation area (RA).
 - All personnel entering a radiological buffer area (RBA) established to limit exposure to external radiation.
 - Declared pregnant workers who are expected to receive an equivalent dose of 50 mrem from external sources or more to the embryo/fetus during the gestation.
 - The HSD may be used for limited monitoring of neutrons where the anticipated neutron dose as read (prior to correction) is less than 100 mrem. All neutron

dose on a HSD must be adjusted. Document the adjustment in an Investigation of Dosimeter Result (IODR).

- Members of the public and minors who are likely to receive a total effective dose of 50 mrem or more.
2. Hanford Combination Neutron Dosimeter (HCND) is required for:
- Personnel who are expected to receive neutron exposure on a regular basis.
 - Individuals who routinely have $H_p(10)_n$ (prior to correction) greater than 100 mrem per year reported on an HSD.
3. Extremity dosimetry is issued for:
- Personnel who are likely to receive an annual equivalent dose to an extremity greater than 5000 mrem.

NOTE: Assignment of multi-pack dosimetry should be discussed with the Dosimetry CTA.

4. Multi-Pack dosimetry is issued when there is a non-uniform radiation field to which the worker is going to be exposed. Multiple whole body dosimetry should be worn when:
- The effective dose to a portion of the whole body is expected to exceed the deep + neutron equivalent dose measured by the primary dosimeter by more than 30 percent and the anticipated whole body dose is greater than 100 mrem for the job.
 - The effective dose from external sources is expected to exceed the deep + neutron equivalent dose measured by the primary dosimeter by more than 100 mrem.
 - If the individual's routine chest dosimeter is believed to have significant dose (e.g., greater than 100 mrem) or the individual's year-to-date dose is near an administrative control level (ACL), then the primary dosimeter should be processed before the multiple dosimeter packet is assigned to establish the individual's current dose status.
 - If the routine chest dosimeter is known to have low dose, then it may be temporarily stored during multipack use, and worn as the primary (reference) dosimeter at times when the multipack is not being used (including the remainder of the dosimeter's exchange period after the routine job has ended).
5. Dosimeters are not to be worn during or after medical procedures until approved by the CTA or FPOC.
6. Dosimeters should not be put through security scanners at airports or taken on airplanes.
7. Dosimeters shall be issued only to personnel formally instructed in their use and shall be worn only by those to whom the dosimeters were issued. (7.1.1)

8. Routine field measurements are required by the DOE Laboratory Accreditation Program (DOELAP) to ensure that the Hanford dosimetry system is providing the proper dose rates for personnel dose. (7.1.1, 7.1.2)
9. Company Technical Authority (CTA) for dosimetry will supply the facility points of contact (FPOCs) a year-to-date dose report as requested by the FPOC.
10. The CTA or FPOCs will generate a manager's report for each manager with workers that have year-to-date dose greater than 100 mrem Total Effective Dose (TED).

4.2 Wearing Dosimeters

The following four topics must be applied whenever a dosimeter is worn.

1. Body Location

The primary dosimeter (HSD or HCND) must be worn:

- On the front torso between the neck and waist
- With the beta (Mylar™) window facing away from the body (the word "FRONT" will be visible to others)
- For HSDs the clip strap (or other holding device) must go through the hole at the top (the end near the Mylar window) to ensure the dosimeter does not open during use
- For HCNDs the clip strap must go through the top of the plastic holder and both the beta and neutron dosimeter must be worn together at all times. The HCND is calibrated in this configuration and will not provide accurate dose measurements if the configuration is altered.
- If other objects are worn, they must not overlap the front of the dosimeter.

2. Extremities

- a. Finger rings should be worn so that the thermoluminescent dosimetry (TLD) chip contained in the ring faces the source of the maximum dose rate to the extremity.
- b. The TLD chip should normally face in the same direction of the palm during hands-on work with a sample container, but should face the back of the hand or side of the finger when using extension tools to work with a sample container.
- c. Finger rings should only be worn as required by the RWP. Do not store finger rings on lanyards, in pockets, etc.

3. Distance from the Body

Normal positioning of the primary dosimeter on the body should not exceed one half inch (1.3 centimeters) from the body surface.

4. Clothing

See TFC-ESHQ-RP_DOS-C-08, for instructions on wearing supplemental dosimeters.

Ideally, primary dosimeters should be worn next to the skin. Practically, they should be worn under protective clothing and can be worn on a lanyard or clipped to a pocket or shirt.

Placement of the primary dosimeter or an additional dosimeter on the outside of protective clothing near the skin may likely be necessary when:

- beta radiation field is mostly between 100 keV and 250 keV, and
- substantial areas of skin (100 cm² or more) are uncovered (e.g., the face and neck), then
- If the exposed skin is anticipated to receive a shallow dose equivalent more than 10 times the deep dose equivalent from photons and neutrons measured by the chest dosimeter and the exposed skin may receive a shallow dose equivalent greater than 500 mrem.

When there is concern the actual dose to the eye will exceed the eye dose recorded on a primary dosimeter worn under clothing by more than 300%, and the actual dose to the eye will exceed 100 mrem, then the primary dosimeter should be worn outside the protective clothing, or an additional dosimeter should be worn outside the clothing to record the eye dose.

When garments that provide partial-body shielding are worn, such as lead vests or Patrol protective vests, the primary dosimeter should be worn outside the garments. A secondary dosimeter may, if appropriate, be worn inside the garments to measure the actual dose to the protected portions of the whole body.

It may be necessary to protect primary dosimeters worn outside of protective clothing from contamination by using a thin plastic bag. Plastic bags used for this purpose must be the HPDAC approved "Whirl-Pak" bags available at the radiological access control system (RACS) station or from the FPOC. HNF-55634, "Hanford External Dosimetry Technical Basis Manual" documents this bag as the site standard for protecting HSDs from radiological contamination while maintaining the DOELAP accreditation.

4.3 Initial Dosimeter Issue for New Hire and Subcontractors (7.1.1)

NOTE: Acquisition of initial dosimeters, including completion of all associated paperwork, will be performed at the WRPS Dosimetry Operations (DO) Office located in Building 2750E, Room C116 in the 200 East area except for WRPS new hires. This takes place at the designated building provided by Human Resources.

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| Employee or Line Manager | 1. Complete a WRPS Dosimetry Change Request Form (DCR) A-6004-105) in advance. |
| Line Manager | 2. Send the completed form to the assigned Dosimetry FPOC or CTA for signature. |
| CTA or FPOC | 3. Determine the need for internal dosimetry in accordance with TFC-ESHQ-RP_DOS-C-04, and request necessary baseline bioassay(s) on the same form. |

NOTE: For an employee considered active with Dosimetry, changes will be made and sent to the manager. Dosimetry inactive employees (subcontractors) will need to go to the WRPS Dosimetry Operations office to complete paperwork to activate their records.

4. Review the DCR for accuracy and completeness. Sign the form and send it to ^WRPS Dosimetry Operations.

NOTE: This form is only available in the WRPS DO office.

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| Subcontractor | 5. Once WRPS DO has received the DCR, go to WRPS Dosimetry Operations and complete a history of work with radioactive materials using Radiological Control Records Personal Radiation Exposure History (BC-3000-710). |
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4.4 Visitor (Vendor, Tours, Other) Dosimeter

The following information is required in order to process a Visitor/Vendor Dosimeter:

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| WRPS Host | <ol style="list-style-type: none"> 1. Send the following to the Internal and External Dosimetry FPOC three days in advance: <ul style="list-style-type: none"> • <u>Full</u> name (last, first, middle) • SSN# or HID# (If no HID number, an HID request form [A-6004-350] must be completed and signed by the visitor.) • Day of arrival and day of exit • Name of host (must be a permanent WRPS employee, not a subcontractor manager) |
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- Department # (not org. code)
- Area of visit/reason for visit
- Proof of training either from badging after receiving the badge or of any online training. This can be given at the time of arrival to WRPS DO. The training qualification cannot be entered into RACS without it.

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| CTA or FPOC | 2. Review all information received. |
| | 3. Forward the information to ^WRPS Dosimetry Operations for processing. |
| WRPS Dosimetry Operations | 4. On the day of arrival, issue a dosimeter once the following requirements have been met (see TFC-ESHQ-RP_DO-P-12: <ul style="list-style-type: none"> • Radiological Area Visitor Form (BC-3000-02) has been completed and submitted • Proof of current required training is shown. |

NOTE: A visitor dosimeter cannot be extended beyond the original visitation end date once used to log in at a RAC station. The Radiological Access Control System does not allow a dosimeter expiration date to be changed after it has been used at a RAC station. If a visitor dosimeter has not been used at a RAC station, approval for a date extension is done on a case-by-case basis. Written justification must be provided for WRPS DO approval.

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| WRPS Host or FPOC | 5. Return the dosimeter to WRPS DO on the expiration date (located on the dosimeter). |
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4.5 Changes in Worker Exposure

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| Employee/Manager | 1. If the potential for a worker's exposure changes, complete a Dosimetry Change Request (DCR) form in accordance with the recommended dosimeter exchange schedules. |
| | 2. Contact the applicable Internal and External Dosimetry CTA or FPOC if assistance is needed completing the form. |
| Internal and External Dosimetry FPOC | 3. See TFC-ESHQ-RP_DOS-C-04 for internal dosimetry requirements. |
| | 4. Review the worker's change in conditions to determine whether internal dosimetry requirements should be re-baselined, or whether bioassay work should cease. |

NOTE: Dosimeter changes will be sent to the manager, and internal changes will be sent to the manager and the employee.

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| CTA or FPOC | 5. Review, sign, and submit the DCR to WRPS DO |
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4.6 Prevention of Non-Occupational Exposure of Dosimeters (7.1.1)

Dosimeter users are responsible for ensuring dosimeters are not exposed to non-occupational sources of radiation, such as medical or security x-ray devices, therapeutic medical sources, are not exposed to high temperatures or radiation from medical radionuclides injected into the body.

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| Employee | 1. Notify the applicable RadCon Dosimetry FPOC prior to exposure to non-occupational sources of radiation. <ul style="list-style-type: none"> a. If prior notification is not possible, report the exposure to the manager and the Internal and External Dosimetry FPOC immediately upon return to the work location. b. Provide a copy of the medical treatment. c. Do not handle the HSD after medical treatment until you are able to pass the personal contamination survey. |
| CTA or FPOC | 2. If notified of a scheduled medical injection of radionuclides, instruct the employee as follows: <ul style="list-style-type: none"> a. Do NOT wear the dosimeter. b. Deliver the dosimeter to the manager/CTA/FPOC. c. Keep the dosimeter in a location where it will not be exposed to occupational radiation or the employee. d. Provide a copy of the medical treatment administered from the medical provider to WRPS DO. |
| WRPS DO | 3. If a restriction needs to be placed, send a written request to WRPS DO. |
| WRPS Dosimetry FPOC | 4. Place RACS work restriction per request. |
| WRPS Dosimetry FPOC | 5. Notify WRPS DO in writing when the employee passes a personal contamination survey (PCM/APM or complete a whole body scan by qualified HPT) to have the restriction removed. |

4.7 Non-Occupational Exposure Event

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| Employee | 1. If the dosimeter has been exposed to non-occupational radiation sources, notify the Internal and External Dosimetry FPOC immediately for further instructions. |
| CTA or FPOC | 2. If an employee's dosimeter has been worn, or is suspected of having been exposed to a non-occupational radiation source, complete the following sub steps: |

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| | a. | Complete site forms A-6007-692, "External Dosimetry Investigations" and A-6007-691, "External Dosimetry Investigation Employee Statement," as detailed in TFC-ESHQ-RP_DOS-P-10. |
| | b. | Send completed site forms and the dosimeter to WRPS DO. |
| WRPS DO | 3. | Process the dosimeter according to WRPS DO procedures and initiate an IODR per TFC-ESHQ-RP_DO-P-19. |
| Dosimetry CTA/FPOC | 4. | For medical isotope treatments, verify the employee can pass a PCM/APM or complete a whole body scan by qualified HPT. |
| | a. | If they do not pass, schedule a follow-up evaluation. |
| | 5. | Once cleared, send an email to WRPS DO so they can provide the employee with a dosimeter and allow resumption of normal work activities. |
| | 6. | If a RACS restriction was placed, and the employee passed the survey, send an email to WRPS DO to remove the restriction. |

4.8 Exchanging Dosimeters

WRPS DO is responsible for maintaining up-to-date records for primary dosimeter processing and exchanges. Examples of items to be updated include exchange frequencies, employee status, etc.

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| Manager | 1. | Notify WRPS DO of any events that would prevent employee dosimeter exchanges, such as leave of absence, employee transfers, terminations by subcontractors, etc. prior to the event. |
| | 2. | Verify the dosimeters that are being exchanged are in good condition and match the exchange list. (Broken Mylar™ windows are the primary cause of dosimeter damage.) |
| | a. | If not, notify the Internal and External Dosimetry FPOC prior to sending the dosimeter to WRPS DO. |
| | 3. | Follow the exchange instructions that accompany the dosimeters from WRPS DO. |
| | a. | Do not perform dosimeter exchange in a radiological area or prior to the begin wear date. |
| Employee | 4. | If vacation is scheduled during the dosimeter exchange period, leave the dosimeter to be exchanged with the manager. |
| Employee and Manager | 5. | Submit primary dosimeters according to the established exchange frequency. |

- If a dosimeter is lost or damaged, contact the Internal and External Dosimetry FPOC.

NOTE: An RACS work restriction will be placed on personnel who have not turned in their dosimetry by the date specified by WRPS DO. Restrictions will be removed when the delinquent dosimetry has been delivered to WRPS DO or an IDOR has been started.

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| FPOC | 7. Ensure personnel return dosimeters for processing as scheduled or upon request. |
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4.9 Using Multiple Dosimetry

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| FPOC/Radiological Control Manager | 1. For initial use of multiple dosimetry (e.g., first time at a specific location or job), determine dosimetry needs with Internal & External Dosimetry CTA. |
| | 2. For initial and subsequent dosimetry packages, order multiple dosimetry package(s) from WRPS DO, and specify the number of dosimeters required and the body locations to be monitored. |
| Line Management | 3. Pick up the dosimetry packages from WRPS DO. |
| Radiological Control Organization | 4. Provide workers with dosimetry wearing instructions. |
| FPOC/Radiological Control Manager | 5. Issue the dosimetry packages to workers and retain their primary dosimeters during the period when the package is being worn. <ol style="list-style-type: none"> Do not change the dosimeter assignments contained within the packages without obtaining approval from WRPS DO. |
| Employee | 6. Wear multiple dosimeters as instructed by the applicable radiological control organization. |
| | 7. Return multiple dosimeters to the applicable radiological control organization at job completion or as requested by the Internal and External Dosimetry CTA or FPOC. |
| FPOC/Radiological Control Manager | 8. Return original primary dosimeter to the employee upon the return of the multiple dosimeter package, after ensuring the employee's yearly dose is <80% of the ACL. |
| | 9. Collect and return multiple dosimeter packages to WRPS DO. |

4.10 Using Extremity Dosimetry

Extremity dosimeters must be worn when extremities may receive an equivalent dose that is ten times greater than the equivalent dose received by the chest and greater than 500 mrem. This does not preclude the use of extremity dosimetry under any circumstances where sound health physics judgment would warrant their use. For auto finger rings steps 4 through 6 apply.

NOTE: A summary of external dosimetry recommendations is provided in Table 1.

- FPOC
1. Order extremity dosimeters, such as finger rings, from WRPS DO by sending an email in advance of needed issue date.

NOTE: Finger rings are issued in accordance with TFC-ESHQ-RP_ADM-C-30.

- Employee
2. Wear extremity dosimetry as directed by the applicable RWP.
 - Finger ring dosimeters are assigned by Hanford Identification (HID) number and are worn in pairs (e.g., one on each hand.)
 - Finger ring dosimeters should not be stored anywhere except designated areas. Dosimeter finger rings should not be stored on lanyards, pockets, etc..
 - Finger rings are issued in numerical order only even-numbered ring to be worn on the right hand and the odd number is worn on the left hand. The Finger ring label identifies which hand the ring is to be worn on (L - for left and R - for right).
 - The white label side should always be worn against the skin as directed on each finger ring label (skin side)
 - The TLD chip of the finger rings should always be facing the highest radiation exposure source relative to the extremity.

4.11 Performing Off-Site Work with a TOC Issued Dosimeter

Employees shall not wear dosimeters issued by Tank Operating Contractor (TOC) while being monitored with dosimetry from another company, unless authorized by the TOC Radiological Control Manager.

If off-site work performed with a TOC issued dosimeter is authorized, records of off-site dose shall be submitted for inclusion into the individual's radiation exposure monitoring records within 30 days upon receipt.

- Manager/Subcontract or
1. If the worker is temporarily assigned off-site, notify WRPS DO by email two weeks before the employee's departure, and include the following information:
 - Employee name and HID

- When/dates of work period
 - What the employee will be doing
 - Whether the employee will be working in a radiological area, and if so what type
 - Expected dose.
- Employee
2. Provide a report to the DO of any dose received, even if the dose received is zero.
 3. Verify that you do not exceed your ACL.
 4. If the temporary assignment will extend beyond the dosimeter issue period, submit the primary dosimeter (HSD or HCND) to WRPS DO or your manager.
 5. If the temporary assignment will not extend beyond the dosimeter issue period, deliver primary dosimeter (HSD or HCND) to the Internal and External Dosimetry FPOC or return the HSD to WRPS DO for storage until returning to the Hanford Site.

4.12 Dosimeter to be Issued at Off-Site Facility

NOTE: It is the worker's responsibility to notify DO and provide a report of any dose received, even if the dose received is zero. The worker is also responsible for making sure they do not exceed their ACL

- Manager/Employee
1. Notify Internal and External Dosimetry CTA and WRPS DO 2 weeks prior to off-site work/visit (e.g., Pacific Northwest National Laboratory [PNNL]).
 2. Provide the following information to WRPS DO and Internal and External Dosimetry CTA:
 - Hosting company
 - Start and end date(s) of work performed or visit planned
 - Work/visit description—duties to be performed, etc.
 - Location of work/visit
 - Answer to, "Will worker be entering into any radiation areas?"
 - Dose estimate for duration of work/visit.
- CTA/DO
3. Determine if employee's records need to be closed out prior to work/visit at off-site facility.
 4. Notify WRPS DO if records are to be closed out.
- WRPS DO
5. Schedule any necessary closing bioassays.

- Employee 6. Obtain off-site dose records from hosting company and submit them to WRPS DO within 30 days of receipt.

4.13 Performing Temporary Work for Other Hanford Contractors

- Manager 1. If TOC worker is temporarily assigned to another Hanford contractor, inform the Internal and External Dosimetry CTA at least two weeks prior the employee's departure.

NOTE: Based upon the information given, the Dosimetry CTA of the employee's responsible company (i.e., the company who issued employee's dosimeter) will decide upon the authorization of temporary work using the originally issued dosimeter.

2. Send the following information to both Dosimetry CTAs of the involved Hanford Contractor companies:

- Start and end date(s) of work performed
- Work description (duties to be performed, etc.)
- Location of work
- Answer to, "Will worker be entering into any radiation areas?"
- Dose estimate for duration of work/visit.

- CTA 3. If the worker dose estimate is ≤ 50 mrem for a job:
- a. Allow work using a WRPS dosimeter.
 - b. Require a supplemental dosimeter to be worn during work.
 - c. Document the agreement from receiving Dosimetry CTA in an email to both Dosimetry CTA and the Dosimetry Operation offices for both companies.

- Dosimetry Operations 4. If the worker dose estimate is > 50 mrem for a job:
- a. Contact the receiving Dosimetry CTA and WRPS DO of the need to terminate a worker's WRPS dosimetry schedule
 - b. Terminate the worker's WRPS Dosimetry schedule and document the termination with both Dosimetry CTAs in an email.

4.14 Receiving Employees from Another Hanford Contractor for Temporary Work

When temporary work for TOC is performed by an employee from another Hanford contractor (i.e., employee's responsible company), the Dosimetry CTA will make the determination of allowing responsible company issued dosimeter to be used or not.

Documentation of agreement is required and to be given to WRPS DO.

4.15 Granting Minor Visitors Access to Radiological Areas

(7.1.1)

NOTE: A radiologically controlled area is not a radiological area but may contain radiological areas.

Minor visitors (i.e., persons under the age of 18 years) can visit certain radiological areas on the Hanford Site. Contact WRPS DO for assistance with large groups or events. Minors must be monitored for exposure if they enter a RBA or radioactive material area (RMA), or if they are likely to receive greater than 50 mrem in a single year.

4.15.1 Before Minor's Access

NOTE: Minors visiting for educational purposes are issued Hanford dosimetry for entering RBAs, RMAs, or underground radioactive material areas.

- Host
1. Obtain written authorization from the minor's parent or guardian.
 2. Verify that the minor has met safety training and security site access requirements.
 3. If the minor will be entering any radiological areas, obtain the approval of the applicable facility/project radiological control director of the facility to be visited.
 4. Obtain dosimetry, if required.

4.15.2 During Minor's Access

(7.1.1)

NOTE 1: Minors under the age of 16 years may only enter radiological controlled areas and underground RMAs.

NOTE 2: Minor employees are not permitted access to radiological areas or radiological controlled areas to perform work. WAC 296-125-030, "Prohibited and hazardous employment—All minors," prohibits minors from working in occupations where they are exposed to radioactive substances or ionizing radiation sources.

- Host
1. Ensure that the minor does not enter any radiological areas other than RBAs, RMAs, or underground radioactive material areas.
 2. Ensure the minor does not:
 - Receive exposure
 - Encounter any removable contamination
 - Encounter dose rates greater than 50 microrem/hour
 - Handle or touch radioactive material

4.16 Changes to Administrative Control Levels

Table 2 lists the Tank Operating Contractor (TOC) administrative control levels (ACLs) and the required approval to change them. Use the Administrative Control Level Change Approval form (A-6002-916) to process the ACL change. Examples of justification for changing an employee's ACL are provided in Attachment A. ACL change approval instructions are contained in Attachment B. (7.1.1)

NOTE: An ACL change must be made in complete levels. For example, from 500 mrem to 1000 mrem and/or from 1000 mrem to 1500 mrem, etc.

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| <p>Manager or Internal and External Dosimetry FPOC</p> | <p>1. If the ACL change is for several personnel or for an entire organization, and the same justification is used for everyone, complete the following sub-steps.</p> <p>a. Request the change in a letter addressed to the facility/project Radiological Control Manager.</p> <p>b. The letter must contain all of the elements of the Administrative Control Level Change Approval form (A-6002-916) and the required approval signatures.</p> |
| <p>Facility/Project Radiological Control Manager</p> | <p>2. Review and approve the letter requesting the ACL level change by signing the letter.</p> |
| <p>Manager or Internal and External Dosimetry FPOC</p> | <p>3. Complete an Administrative Control Level Change Approval form (A-6002-916).</p> <p>4. Send the completed form (or letter) to the WRPS ALARA Chairperson.</p> |
| <p>WRPS ALARA Chairperson</p> | <p>5. Review the form (or letter) for completeness and correctness of doses listed, ensuring the following items have been considered:</p> <ul style="list-style-type: none"> • Is the justification valid to extend the ACL • Do the special considerations make sense from an ALARA perspective • Has the employee been briefed on the change • Is the ACL change request for a complete level • Does the ACL change justify whole body or extremity ACL changes or both • Is there a need to change the dosimetry exchange cycle? <p>6. Once verified, send the form to WRPS DO for a second review of information.</p> |

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| WRPS DO | 7. Review the form, and if correct, return the form to the applicable Internal and External Dosimetry FPOC. |
| Internal and External Dosimetry FPOC | 8. Gather the necessary signatures and approvals. |
| WRPS ALARA Chairperson | 9. Send the completed record copy (usually the original form or letter) to the WRPS ALARA Chairperson for final approval. |
| Internal and External Dosimetry CTA | 10. Approve and send the completed record copy to the CTA for approval. |
| WRPS DO | 11. Approve the completed record and send it to WRPS DO for processing. |
| WRPS DO | 12. Distribute the completed form to: <ul style="list-style-type: none"> • Original to Radiological Site Services (RSS) Records (workers permanent file) • Copy to the RACS administrator • Copy to the Share drive for reference. |
| RACS administrator | 13. Change ACL as guided by ACL documentation. |

4.17 Suspect Dosimetry Status

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| Manager, WRPS DO, CTA, FPOC | 1. If for any reason the status of a worker's dosimetry is in question, place a RACS restriction on the worker to ensure that no radiological entries occur without appropriate monitoring. Examples include, but are not limited to: <ul style="list-style-type: none"> • A lost HSD has been found, but employee has not contacted their manager or WRPS DO to receive a new HSD. The employee may be unaware of lost HSD status and attempt radiological entry. • A worker has not responded to requests for signature on an Investigation of a Dosimeter Results (IODRs) form. • A subcontractor has terminated employment with one company and started employment with a new company, but WRPS DO has not received their HSD. |
| | 2. If it is determined that a worker has made radiological entry without proper monitoring, initiate a dosimetry investigation according to TFC-ESHQ-RP_DOS-P-10. |

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3. Once the status of a worker's dosimetry has been resolved, lift the RACS restriction.

5.0 DEFINITIONS

Administrative Control Level. A numerical dose constraint established at a level below the regulatory limits to administratively control and help reduce individual and collective dose.

Effective Dose. The summation of the equivalent doses in specified tissues or organs, each multiplied by the appropriate tissue weighting factor.

Equivalent Dose. The absorbed dose in an organ or tissue due to a given radiation, multiplied by the radiation weighting factor.

Extremity. Hands and arms below the elbow or feet and legs below the knee.

Whole Body. For the purpose of external exposure, the head, trunk, arms above and including the elbows, and legs above and including the knees.

6.0 RECORDS

The following records are generated during the performance of this procedure:

- A-6004-350 Hanford Identification (HID) Number Request
- Radiological Control Records Personal Radiation Exposure History (BC-3000-710)
- Radiological Area Visitor Form (BC-3000-002)
- Reports to Support Offsite Work
- Dosimetry Change Request Form (A-6004-105)
- Temporary Dosimeter Issue Form (BC-3000-703)
- Written Authorization from Minor's Parent or Guardian
- Administrative Control Level Change Approval Form (A-6002-916)
- Administrative Control Level Change Approval – Continuation Sheet (A-9002-916.1)
- Multi-Pack Worksheet (A-6006-265).

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02. The records prepared during the performance of this procedure are submitted to and maintained by the Hanford Radiological Records Project administered by RSS, in accordance with RPP-13033, "Tank Farms Documented Safety Analysis."

7.0 SOURCES

7.1 Requirements

7.1.1 HNF-5183, "Tank Farms Radiological Control Manual (TFRCM)."

7.1.2 DOE/RL-2002-12, "Hanford Radiological Health and Safety Document."

7.2 References

7.2.1 HNF-55634, "Hanford External Dosimetry Technical Basis Manual."

- 7.2.2 RPP-13033, "Tank Farms Documented Safety Analysis."
- 7.2.3 TFC-BSM-IRM_DC-C-02, "Records Management."
- 7.2.4 TFC-ESHQ-RP_DOS-C-04, "Internal Dosimetry."
- 7.2.5 TFC-ESHQ-RP_DOS-C-08, "Supplemental Dosimetry."
- 7.2.6 TFC-ESHQ-RP_DOS-P-10, "External Dosimetry Investigations."
- 7.2.7 TFC-ESHQ-RP_DO-P-12, "Visitor Dosimetry."
- 7.2.8 TFC-PLN-61, "Tank Operations Contractor Training and Qualification Plan."
- 7.2.9 WAC 296-125-030 (6), "Prohibited and hazardous employment -- all minors."

Table 1. Summary of External Dosimetry Recommendations.

Dosimeter Type	None	Hanford Standard or Combination Neutron ^(a)			
Exchange Frequency	None	Annual ^(b)	Semi-Annual ^(c)	Quarterly ^(d)	Monthly ^(e)
Occupational Exposure Potential	Very Low <100 mrem/yr	Low <200 mrem/yr	Moderate <300 mrem/yr	Moderate >75 to <120 mrem/quarter	High >40 mrem/month
	<p>(a) Assign the Hanford combination neutron dosimeter to all personnel who are likely to receive an effective dose from neutrons ($H_p(10)_n$) greater than 100 mrem annually from neutrons and to Individuals who routinely have $H_p(10)_n$ greater than 100 mrem per year reported on an HSD.</p> <p>(b) Assign the annual Hanford standard dosimeter/Hanford combination neutron dosimeter to personnel whose likely radiation exposure is low, <50 mrem per quarter (<200 mrem/y). Fire, Patrol, and other emergency response personnel are usually assigned this dosimeter exchange frequency.</p> <p>(c) Assign the semi-annual Hanford standard dosimeter/Hanford combination neutron dosimeter to personnel whose likely radiation exposure is moderate, >50 mrem to <75 mrem per quarter (300 mrem/y).</p> <p>(d) Assign the quarterly Hanford standard dosimeter/Hanford combination neutron dosimeter to personnel whose likely radiation exposure is moderate, between >75 mrem and <120 mrem per quarter.</p> <p>(e) Assign the monthly Hanford standard dosimeter/Hanford combination neutron dosimeter to personnel whose likely radiation exposure is high, >40 mrem per month.</p>				

NOTE: It is necessary to monitor the dosimeter exchange frequencies to ensure that personnel doses are accurately recorded. It is also necessary to assign longer dosimeter exchange frequencies to employees whose dosimeter results frequently show no exposure for the period worn.

Table 2. Tank Farms Administrative Control Levels.

Type of Exposure-Annual Radiological Dose (in mrem)				
Whole Body (a)	Skin and Extremities (b)	Lens of the Eye (c)	Any organ or tissue (d)	Approval Required to Exceed This Level (approvals are sequential)
500	15,000	4,500	15,000	Level 2 line manager & Project RadCon manager
1,000	22,500	6,750	22,500	Level 1 line manager & WRPS RadCon Manager
1,500	30,000	9,000	30,000	WRPS Chief Operating Officer
2,000				DOE-ORP Site Manager
Age x 1,000 = lifetime total effective dose (TED)				Level 1 line manager & WRPS RadCon Manager
(a) Whole Body Total Effective Dose (internal + external) (b) Skin and extremities: equivalent dose to the skin or any extremity (external) + committed equivalent dose to the skin or any extremity (internal) (c) Equivalent dose to the lens of eye (d) Any organ or tissue (other than lens of eye): equivalent dose to the whole body (external) + committed equivalent dose (internal)				

See Attachment A for examples of justifications for changing an employee's ACL.

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ATTACHMENT A - EXAMPLES OF ADMINISTRATIVE CONTROL LEVEL (ACL) JUSTIFICATION

NOTE: This attachment is intended as guidance only and not a requirement. This information is provided to assist facilities in documenting the justification for changing an employee's ACL.

1. An employee has specialized training and/or experience level that would make utilizing other workers less cost effective and more dose "costly."

Example: An employee's extensive knowledge and experience on a particular project is critical for the continuity and efficiency of the project. To train a new employee, familiarize him or her with the project and expectations could impact cost and schedule of the project. The employee's knowledge of the job will minimize exposure for other radiological workers, and help ensure safety because this particular employee is most familiar with the radiological conditions of this project.

Example: An individual has extensive knowledge troubleshooting and repairing the in-cell 10-ton crane. To utilize a less experienced person would increase facility collective dose.

NOTE: The Administrative Control Level Change Approval – Continuation Sheet (A-6002-916.1) will be used in conjunction with Administrative Control Level Change Approval form (A-6002-916) for Administrative Control Level changes that exceed 1000 mrem.

2. A particular vendor has an employee with a special certification or training, and a certified or specially trained individual is required to complete the work. No other employees have this particular certification or specialized training.

Example: Dose reduction efforts required hydro lasing piping located near traffic areas to reduce the background dose to workers walking through the area. A company was brought in to perform the hydro lasing

**ATTACHMENT B - ADMINISTRATIVE CONTROL LEVEL (ACL) CHANGE APPROVAL
INSTRUCTIONS**

NOTE: Each level of the ACL Change requires additional signatures than the previous level. These signatures are cumulative and you cannot get approval for the second level until you have the approvals to exceed the first level on the form.

HEADER

Enter the information requested.

ACCUMULATED DOSE YEAR TO DATE (mrem)

Enter the year-to-date dose only for the type of dose this ACL is being processed for, either whole body or extremity or both.

SPECIAL CONSIDERATIONS

State, as appropriate, the ALARA methodologies being applied. For example, specific actions taken to minimize and control dose, time keeping, shielding, the use of electronic dosimetry and any other actions that demonstrate dose tracking and dose minimization.

JUSTIFICATION

State why the ACL change is needed for this employee. Do they have specialized training, experience that is not replaceable, skills that will reduce the collective dose for the job? Why is this ACL change needed for this employee?

Send the completed form to WRPS ALARA Chairperson for review.

WRPS ALARA Chairperson reviews the form based on the criteria listed in this procedure and, then forwards the form to WRPS DO for a second review. At this point in the review, there are no approval signatures required.

WRPS DO will return the reviewed form with any comments to the appropriate FPOC.

The FPOC will obtain the necessary signatures for the approval based on this procedure then return the form to the WRPS ALARA Chairperson for a signature.

The WRPS ALARA Chairperson will approve the form and send it to the Personnel and Area Dosimetry CTA for approvals.

The CTA will approve the form and send it to WRPS DO for distribution.