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CCP-HSP-013

Revision 1

CCP
Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma Ray Spectrometer (SGRS) Nondestructive Assay Systems Health and Safety Plan

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Larry Porter

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	02/27/2005	Initial issue.
1	11/16/2010	Editorial changes to reflect current equipment configurations.

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1.0 PURPOSE

1.1 Scope

This plan is a discussion of the health and safety considerations that apply to the CCP Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma-Ray Spectrometer (SGRS) Nondestructive Assay (NDA) systems located at the Idaho National Laboratory (INL) and may supplement or be superseded by Host site health and safety requirements.

2.0 REQUIREMENTS

2.1 References

Baseline Documents

- *Hazardous Waste Facility Permit*, issued to the Waste Isolation Pilot Plant, Identification No. NM4890139088-TSDF, by the New Mexico Environment Department, *Waste Analysis Plan* (WAP)
- DOE/CBFO-94-1012, *US Department of Energy Carlsbad Field Office Quality Assurance Program Document* (QAPD)
- CCP-PO-001, *CCP Transuranic Waste Characterization Quality Assurance Project Plan*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-005, *CCP Conduct of Operations*
- CCP-PO-024, *CCP/INL Interface Document*
- CCP-TP-010, *CCP Waste Assay Gamma Spectrometer (WAGS) and SWEPP Gamma-Ray Spectrometer (SGRS) Calibration Procedure*
- CCP-TP-019, *Operating the CCP Waste Assay Gamma Spectrometer (WAGS)*
- CCP-TP-068, *CCP Standardized Container Management*
- CCP-TP-109, *CCP Data Reviewing, Validating and Reporting Procedure*

- CCP-TP-115, *CCP SWEPP Gamma-Ray Spectrometer (SGRS) Operating Procedure*
- CCP-TP-140, *CCP Equipment Maintenance*
- JSA – 387, *WAGS Calibration SO Test*
- CCP-HSP-014, *Health and Safety Implementation Program for CCP*

Referenced Documents

- CCP-QP-002, *CCP Training and Qualification Plan*

2.2 Training Requirements

2.2.1 Personnel utilizing this plan will be qualified according to CCP-QP-002, *CCP Training and Qualification Plan*.

2.2.2 Personnel operating these Central Characterization Project (CCP) NDA systems shall have documented evidence, as part of his/her training record, that they have read and understand the Host site interface document and this plan.

2.2.3 Personnel operating these CCP NDA systems shall have Radiation Worker I or II training as required by the Host site.

2.2.4 Supervisory personnel, for all CCP NDA systems, shall have Lockout/Tagout (LO/TO) training as required by the Host site.

2.2.5 Personnel operating all CCP NDA systems shall have completed all Host site-specific required health, safety, and occupational training.

3.0 RESPONSIBILITIES

3.1 Host Site Support

3.1.1 Provides Radiation Control and Health Physics support as defined in the Host site interface document.

3.1.2 Provides material movement and material scheduling support as defined in the Host site interface document.

[A] Host site personnel will move, stage, load, and unload waste containers scheduled for characterization by NDA systems.

[B] Site personnel will be responsible for completing, maintaining, and submitting all Host site-specific documentation for the movement and scheduling of waste containers for characterization by NDA systems.

3.1.3 Provides facility engineering and facility maintenance support as defined in the Host site interface document.

3.2 Subcontract Technical Representative (STR)

3.2.1 Responsible for the safe performance of all NDA activities.

3.2.2 Assures that all NDA activities performed conform to Host site health, safety, and environmental compliance requirements.

3.2.3 Coordinates all NDA activities to conform with or complement Host site health, safety, and environmental compliance requirements.

3.2.4 Reports all unresolved health, safety, and environmental compliance issues to the Vendor Project Manager (VPM) and the responsible Host site representative.

3.3 Vendor Project Manager (VPM)

3.3.1 Responsible for on-site management of NDA operations to assure safe performance of all NDA activities.

3.3.2 Approves operational changes to the activities defined in the interface document.

[A] Documents statement that operational changes do not significantly affect Host site health, safety, or environmental compliance requirements.

[B] Documents specific changes to the activities defined in the interface document.

[C] Submits operational changes that constitute a change in hazard or safety scope to the STR for approval.

[D] Directs the revision of this plan to address any change in hazard or safety scope.

3.3.3 Assures that this plan is current and approved for use, the STR approves NDA operations, and ensures NDA operations personnel are appropriately trained for NDA operations before such operations are initiated.

3.3.4 Shall be accessible in the area or by phone when NDA operations are performed.

3.4 NDA Operator

NOTE

All personnel have “STOP WORK” authority at any time, if they feel an unsafe condition exits.

3.4.1 Shall be responsible for the safe conduct of operations for the WAGS and SGRS units.

3.4.2 Shall control access of all visitors and untrained personnel to the WAGS and SGRS units.

3.4.3 Shall report all unresolved health, safety, and environmental compliance issues to the VPM and the Shift Supervisor.

3.5 NDA Lead Operator (LO)

3.5.1 Shall be responsible for the training and oversight of NDA operators with respect to safe conduct of operations within the NDA characterization unit.

3.5.2 Shall report all unresolved health, safety, and environmental compliance issues to the VPM and the Shift Supervisor.

4.0 NDA SAFETY SYSTEMS, HAZARDS, AND CONTROLS

4.1 Onboard Radiation Safety Systems

4.1.1 Radiation Safety Systems

Hazards

[A] The WAGS system uses three Ba-133 Transmission sources to establish matrix attenuation factors.

[B] Waste containers, scheduled for characterization by the WAGS and SGRS systems, may contain various radioactive isotopes of varying mass and concentration.

Controls

NOTE

Initial setup and routine surveys are performed by Radiation Control personnel to ensure source shielding is effective. These surveys confirm that personnel radiation exposure, due to NDA system sources, remain as low as reasonably achievable (ALARA).

[C] The WAGS source shutter is interlocked to the assay chamber door to prevent incidental exposure to source gamma rays. The programmed automated operation prohibits access to the assay chamber any time the source shutter is open. The chamber doors will not open, unless the Transmission shutter is in the “Closed” position.

[D] The WAGS transmission source shutter provides a highly collimated interrogation beam of gamma rays to the sample. This shutter prevents exposure of the source as it will fail-safe in the closed position.

[E] Status lights indicate when the interrogation source is in use and when mechanical motion is imminent or occurring.

NOTE

The WAGS system uses a red lamp to indicate the transmission source shutter is open. An illuminated amber lamp, along with an audible sound, indicates mechanical motion.

[F] Appropriate radiation signs shall be posted outside the WAGS and SGRS units and in adjacent areas as directed by radiological Host site controls.

[G] Thermoluminescent dosimeter (TLD) and other radiation detection devices, required by the Host site, shall be worn by all personnel accessing the WAGS and SGRS units as directed by Host site radiological controls.

[H] Radioactive sources will be handled in accordance with Host site source user requirements.

[I] Host site Radiological Control Technicians (RCT) perform routine surveys of the WAGS and SGRS units as specified by the Host site Health and Safety or Health Physics organization.

[J] Routine personnel monitoring for radiological contamination will be performed in accordance with Host site Radiation Control requirements.

[K] NDA operators will control personnel access to the WAGS and SGRS units.

4.2 Fire Safety

Hazards

4.2.1 Combustibles may be located inside waste drums.

4.2.2 Miscellaneous combustibles are used in and around equipment (wiring insulation and other plastics, paper, etc.)

4.2.3 Building heating uses propane. The equipment does not use propane.

Controls

4.2.4 NDA operations personnel shall complete Host site fire safety and fire extinguisher use training as required.

4.2.5 Storage and accumulation of combustible materials and maintenance debris shall be restricted, and excess materials shall be removed from the NDA units and surrounding vicinity as soon as possible.

4.2.6 No spark producing or open flame operations (welding, grinding, cutting, etc.) shall be allowed with waste containers in the NDA unit. Repairs requiring the use of spark producing or open flame operations must be approved by the STR, VPM, and authorities for the Host site health, safety, or environmental compliance requirements.

4.2.7 All fires must be reported to the Shift Supervisor.

4.3 Electrical Safety

Hazards

4.3.1 Electrical hazards, including severe shock, could occur while performing repair work on the NDA unit electrical equipment or computers.

Controls

4.3.2 Electrical components and installation meet National Fire Prevention Association (NFPA) 70, the National Electrical Code (NEC).

4.3.3 WAGS and SGRS units electrical supplies are correctly labeled per Host site requirements.

4.3.4 Equipment maintenance and repair work shall be performed only by qualified personnel as designated by the VPM, STR and the Host site.

4.3.5 Equipment maintenance and repair work shall be performed only by qualified personnel utilizing appropriate Lockout/Tagout (LO/TO) protocol approved by the VPM and STR and as directed by the Host site Shift Supervisor (SS).

4.3.6 Whenever possible equipment will be de-energized prior to repair, if energized, equipment repair will be performed in accordance with Host site requirements.

4.4 Mechanical Safety

Hazards

4.4.1 The WAGS NDA unit utilizes electrically powered chain driven conveyors to automatically move waste containers to the NDA assay chamber and away from the NDA assay chamber upon completion of measurement.

4.4.2 The WAGS unit automatically manipulates the waste container while on the transfer conveyor and inside the assay chamber through low intensity lateral motion and rotation movements.

4.4.3 Rigid metal pedestals, frames, and extensions present potential slips, trips, bumps or pinch-point hazards.

Controls

4.4.4 The location of the operator during routine operation of the WAGS and SGRS NDA units mitigates the risk associated with the noted mechanical hazards.

4.4.5 Bump and tripping hazards are posted with warning labels and striped warning tape as necessary.

4.4.6 The WAGS assay chamber door is equipped with a torque limiter switch and pressure sensitive bump pads, that will immediately stop door movement, for equipment and personnel safety.

4.4.7 Personnel shall not break the plane of the NDA unit conveyor assembly while it is activated.

4.4.8 Red “Emergency Stop” buttons are strategically located at specific points on the conveyor assembly on the WAGS and on the electronic control cabinet for both systems to de-activate the mechanical operation of each NDA unit.

4.4.9 Physical warning barriers, chains, ropes, tapes, etc., are employed to indicate areas where access is restricted during NDA system operation.

4.4.10 The operator shall control personnel access to the NDA units during operation.

4.5 Cryogenics

Hazards

4.5.1 The WAGS and SGRS systems germanium detectors must be operated at cryogenic temperatures, therefore Liquid Nitrogen (LN) is required to be used to cool the NDA system Germanium detectors.

NOTE

LN can cause burns to exposed skin due to its extremely cold temperature.

Controls

4.5.2 NDA operations personnel shall have completed pressurized gas and cryogenic safety training as required by the Host site.

4.5.3 The LN cylinders will be appropriately secured in a designated storage location.

4.5.4 When LN cylinders are connected to the detectors, personal protective equipment (PPE) rated for cryogenic use per the Host site requirements shall be used. Appropriate PPE to be used is addressed in Host site LN fill procedure.

4.5.5 The NDA unit shall not be unattended while LN is transferred to the detectors.

4.5.6 Nitrogen gas vented from the germanium detectors shall be directed to an open area or outdoors to prevent asphyxiation.

4.6 Material Handling

Hazards

4.6.1 Personnel injury or equipment damage may occur due to incorrect or improper movement of large, heavy, waste containers.

4.6.2 Beware of slips, trips, falls, and pinch points.

Controls

4.6.3 Individuals shall not lift items that exceed 50 pounds or one third of their body weight, whichever is less, as required by the Host site safety requirements.

4.6.4 Material handling aids (crane, fork truck, drum lift, drum dolly, drum carrier, castor, ramp, or hoist) shall be employed when individual lifting limits will be exceeded.

4.6.5 Placement or removal of waste containers on the conveyor or assay platform, which require remote handling by any of the listed material handling aids will be coordinated by CCP personnel and performed by Host site personnel.

4.6.6 Appropriate PPE worn for waste container movement and material handling activities is addressed in applicable Host site procedures and approved methods of work (AMOW).

4.6.7 Walking and work surfaces shall be maintained in a clean, obstruction free and undamaged condition so as not to impede waste container movement and material handling activities.

4.6.8 All accidents or injuries will be reported to the VPM and Host site Shift Supervisor personnel as soon as possible.

4.7 Emergency Response Plans and Procedures

4.7.1 NDA operations personnel shall be trained to required Host site identification of emergency signals and attendant Host site emergency response and safety protocols for the specific facility of operation.

4.7.2 NDA operations personnel shall participate in Host site scheduled drills concerning recognition of Host site emergency notification and response to the stated emergency.

4.7.3 NDA personnel shall be trained to required Host site protocol to address emergency first aid responses and identification of Host site assistance programs (emergency responder telephone number, medical support location).

4.7.4 NDA personnel shall be knowledgeable of Host site-specific evacuation and sheltering protocol for emergency or disaster conditions.

4.7.5 NDA personnel shall be knowledgeable of Host site-specific inclement weather notification and protocols that address work shutdowns, weather protection, and snow or ice conditions.

4.7.6 NDA operations personnel shall perform systematic shutdown of NDA equipment, according to the appropriate operating procedure, during emergency conditions only if the personnel determine it is safe to do so.

4.8 Other Operational Safety Requirements

4.8.1 **IF** an operator suspects a drum has been damaged or breached they should stop work, warn others, isolate the spill if possible to do so safely, minimize the hazard,
THEN notify the VPM and the Shift Supervisor.

4.8.2 Telephone communication and emergency warning public address notification will be available in each NDA unit or, if not available, portable 2-way radios will be utilized.

4.8.3 Personnel must be aware of the potential for carbon monoxide hazards in the building resulting from the operation of propane heating and material handling equipment.

4.9 Waste Produced

4.9.1 Non-contaminated waste produced as a result of NDA characterization activities, such as packaging materials, waste paper, and spent office supplies shall be disposed of through normal Host site waste disposal procedures.

5.0 RECORDS

No records are generated as a result of this Health and Safety Plan.