

# CCP-HSP-012

Revision 1

## CCP Health and Safety Plan for GGTP

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APPROVED FOR USE

RECORD OF REVISION

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0	03/21/2005	Initial Revision
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## 1.0 PURPOSE

This Health and Safety Plan (HSP) applies to the Gas Generation Testing Program (GGTP), provided by Washington TRU Solutions (WTS) and operated at various U.S. Department of Energy (DOE) sites. The purpose of the HSP is to describe and document operation and system-specific safety features of the GGTP equipment.

### 1.1 Scope

This plan applies to all sites utilizing the GGTP equipment.

## 2.0 REQUIREMENTS

### 2.1 References

#### Baseline Documents

- DOE/CBFO-94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document*
- CCP-PO-002, *CCP Transuranic Waste Certification Plan*
- CCP-PO-005, *CCP Conduct of Operations*
- CCP-PO-016, *CCP Gas Generation Testing Program Quality Assurance Project Plan*
- CCP-PO-024, *CCP/INL Interface Document*

#### Referenced Documents

- Title 29 CFR 1910.1200, *Hazard Communication*
- CCP-CM-001, *CCP Equipment Change Authorization and Documentation*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-TP-083, *CCP Heated Gas Test Canister Operations*
- CCP-TP-089, *CCP Mobile Gas Generation Testing Sampling System (MGSS) Sampling Operations*
- CCP-TP-140, *CCP Equipment Maintenance*

## 2.2 Training Requirements

- 2.2.1 Personnel performing this procedure will be trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan*.
- 2.2.2 All individuals operating GGTP shall have documented evidence as part of his/her training record that he/she has read and understands this document.
- 2.2.3 Personnel associated with the GGTP will have completed Radiological Worker 2, Hazardous Waste and Emergency Response standard (HAZWOPER), Lockout/Tagout (LOTO), Host site facility access, Resource Conservation Recovery Act (RCRA) Compressed Gas, Laser Safety, Personal Protective Equipment (PPE), and any other training required by the Host site.

## 2.3 GGTP/General Information/Requirements

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### NOTE

All work performed in or on the GGTP equipment shall be accomplished in accordance with an approved site-specific Radiological Work Permit (RWP) or equivalent.

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- 2.3.1 The weight and footprint dimensions of the Gas Generation Test Canister (GGTC) and the Mobile Gas Generation Testing Sampling System (MGSS) are as follows:
  - [A] 55-gallon (gal) GGTC Units – 200 lbs per unit
  - [B] 85-gal GGTC Units – 1258 lbs per unit
  - [C] MGSS – 150 lbs with wheeled cart
  - [D] 55-gal and 85-gal GGTC Unit Foot Print – 9 sq ft each (3' x 3')
  - [E] MGSS Foot Print – 12 sq ft (4' x 3')
- 2.3.2 The MGSS cart shall reside in a location where ingress and egress by personnel is not obstructed.
- 2.3.3 Adequate service area for operation of forklifts for drum movement is required.

2.3.4 Various levels of utility support include, at a minimum:

- [A] 110 volts (V) alternating current (AC) 15 amperes (amp) supply for each GGTC (two for 85-gal GGTC)
- [B] Phone line
- [C] 110 V AC 20 amp supply for MGSS
- [D] Two- or three-way communication

2.3.5 Additional Operational Requirements

- [A] A forklift or other suitable equipment to offload and place the GGTC units in a pre-defined area, to be supplied by the Host site.
- [B] Certified operating gases include: ultra-high pure argon, hydrogen gas standards, and industrial grade nitrogen. These gases shall be supplied by the Central Characterization Project (CCP) on an ongoing basis, as needed.

2.4 Site Utilities Requirements

2.4.1 Local toilet and potable water in a designated area for GGTP operating personnel.

2.4.2 Emergency alarm systems.

### 3.0 RESPONSIBILITIES

#### 3.1 GGTP Personnel

- 3.1.1 Operates in a safe manner required by CCP and the Host site.
- 3.1.2 Personnel who have met the training requirements set forth in this HSP and CCP-QP-002 will operate the equipment inside the Gas Generation Testing (GGT) area.
- 3.1.3 Complies with Host site radiological control procedures and health and safety plans.
- 3.1.4 Documents evidence as part of his/her training record that he/she has read and understands this document.

#### 3.2 Radiological Control Technician (RCT)

- 3.2.1 Provides site radiological control support for GGTP operations.
- 3.2.2 Documents evidence as part of his/her training record that he/she has read and understands this document.

#### 3.3 Vendor Project Manager (VPM)

- 3.3.1 Ensures that all work is performed according to this HSP and the specified Host site-specific requirements.
- 3.3.2 Provides on-site management of field operations.
- 3.3.3 Approves changes in operations, as defined in the interface document that do not significantly affect safety or the environment. The VPM shall document the change. Any changes that become hazard or safety issues shall have prior approval of the VPM and the Subcontract Technical Representative (STR), and this HSP shall be revised, reviewed and approved before implementing any changes that affect safety.

#### 3.4 Subcontract Technical Representative (STR)

- 3.4.1 A site-specific person shall take responsibility for the safety of this operation and for assuring that all work is performed in conformance with this HSP and any related Host site-specific Health and Safety requirements.
- 3.4.2 Documents evidence as part of his/her training record that he/she read and understands this document.

#### 4.0 SAFETY SYSTEMS

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**NOTE**

The GGTC unit has pressure relief valves and the pressure is monitored.

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#### 4.1 Radiation Safety

4.1.1 **IF** there is an abnormal occurrence while operating in the GGT area,  
**THEN** perform the following actions unless otherwise directed by Supervisory personnel:

- [A] STOP WORK
- [B] Secure work area
- [C] Notify Shift Supervisor

#### 4.2 Radiation Safety

##### 4.2.1 Hazards

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**NOTE**

Waste containers scheduled for GGT contain various radioactive isotopes of varying mass and concentration.

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**WARNING**

There is a possibility of a radioactive particle emission from a waste drum. Radioactive waste drums are typically sealed and vented through particle filters. Failure of the particle filter or the drum seal could result in radioactive particle emission. In this event, a worker exposure hazard may develop from radioactive particles from waste drums mixing with ambient room air.

##### 4.2.2 Controls

- [A] Practice the as low as reasonably achievable (ALARA) concept.
- [B] Use appropriate tools and equipment to help eliminate exposure to radioactive contamination constituents during drum loading and unloading.
- [C] Personnel will comply with Host site-specific emergency response and evacuation procedures.

[D] Wear proper dosimeters and PPE in accordance with Host site requirements and RCT direction.

[E] On-site RCT personnel will be utilized during GGT operations as required by site-specific radiological plans or permits.

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**NOTE**

Drums with a removable beta/gamma count greater than 200 disintegrations per minute (dpm)/100 cm<sup>2</sup> surface contamination will not be accepted.

Drums with a removable alpha count greater than 20 dpm/100 cm<sup>2</sup> surface contamination will not be accepted.

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[F] The site RCT will conduct direct radiation and smear surveys in accordance with Host site-specific procedures.

[G] Appropriate radiation postings shall be placed inside and outside the GGT area in accordance with Host site-specific radiological control program.

#### 4.3 Radiation Monitoring Safety System

##### 4.3.1 Hazards

[A] Radioactive contamination poses the risk of ingestion and/or inhalation of radioactive material. Ingestion and/or inhalation of radioactive material may result in a source of neutron, gamma, beta, and/or alpha radiological contamination entering the body.

##### 4.3.2 Controls

[A] Radiation and Smear surveys are performed by RCTs on a regular basis in the GGT area in accordance with Host site-specific procedures.

#### 4.4 Fire Safety Systems

##### 4.4.1 Hazards

[A] Transuranic (TRU) waste stored in drums have the potential to have flammable headspace gases (HSGs).

[B] Combustible materials in the GGT sampling area include paper, cloth, and plastics.

#### 4.4.2 Controls

- [A] The GGTC units have pressure relief valves and pressure is monitored.
- [B] Through personnel training and qualification, the CCP program will ensure that only trained/qualified personnel conduct this operation.
- [C] Any activities that involve welding, grinding, cutting with open flames, and high heat sources are prohibited while in the GGT area.
- [D] The GGT area contains hand-operated type ABC fire extinguishers. Only personnel, trained to use fire extinguishers in accordance with Host site-specific requirements, will be allowed to use these extinguishers.
- [E] Personnel will comply with Host site-specific emergency response and evacuation procedures.
- [F] The exit door for the operator's work area shall be clearly marked.
- [G] Good housekeeping practices shall be followed.

#### 4.5 Heated Zones Safety Systems

##### 4.5.1 Hazards

- [A] The GGTCs are heated to 57.3 °Celsius (C).
- [B] The MGSS has the following hot spots:
  - [B.1] Gas Chromatography Space Oven

[B.2] Insulated Enclosure

[B.3] Thermal Conductivity Detector

#### 4.5.2 Controls

[A] Proper PPE (identified in Attachment 1, Personal Protective Equipment Requirements) will be worn in heated zones when appropriate.

[B] When applicable, heated zones will be cooled to appropriate working temperatures when worked on.

### 4.6 Electric Equipment Safety Systems

#### 4.6.1 Hazards

[A] All electrical equipment that is installed and maintained in the GGTP is potentially an electrical hazard. Electrical shock can occur while working on energized equipment or equipment that is turned off but has stored energy.

[B] Electrical system shorts can pose a fire hazard.

[C] Voltage spikes are a potential hazard.

#### 4.6.2 Controls

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#### **NOTE**

Caution should be used when connecting the GGTP equipment to a dedicated power source and while the unit is in the operation mode.

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[A] Personnel will comply with Host site-specific LO/TO procedures when required.

[B] The GGTCs have an independent ground system. The units shall be grounded to an earth ground when in use.

[C] The MGSS shall be grounded to an earth ground and the GGTCs when sampling.

[D] The air compressor or N<sub>2</sub> bottle shall be grounded to an earth ground and the GGTC Units when in use.

[E] Electrically energized components are not exposed.

[F] Fuse circuit breakers will provide additional protection from electrical hazard.

#### 4.7 Pressurized Gas Cylinders Safety Systems

##### 4.7.1 Hazards

- [A] Compressed gases have the potential for creating hazardous working environments. Mishandled cylinders may rupture violently, release their hazardous contents, or become dangerous projectiles.

##### 4.7.2 Controls

- [A] GGT Operators shall read the labels on the cylinders and Material Safety Data Sheets (MSDSs) for safety information.
- [B] Pressure regulators will be installed on gas cylinders that are in service.
- [C] GGT Operators will ensure that safety caps are placed on all pressurized gas cylinders when not in service. This includes certified gas cylinders required for the operation of the MGSS that are empty or in storage. A limited inventory of gas cylinders will be maintained in order to keep the MGSS unit in service.
- [D] GGT Operators will routinely inspect gas cylinders **AND** replace them as needed.
- [E] All pressurized gas cylinders will be properly stored with valves and safety caps completely closed.
- [F] All pressurized gas cylinders will be properly stored **AND** secured with nylon straps or chains outside vehicle traffic areas.
- [G] All gas cylinders will be properly labeled indicating contents. In addition, cylinders will be properly tagged when empty.

- [H] Pressure relief valves will be installed on gas cylinders and attached vent lines must be oriented so that vented gas is not directed toward personnel.
- [I] Emergency response will be in accordance with Host site-specific procedures.

#### 4.8 Hazardous Material Safety Systems

##### 4.8.1 Hazards

- [A] The dry chemicals used in the extinguisher can cause eye, skin, and respiratory discomfort.
- [B] Liquids may form in the GGTC while cooling. These liquids may contain volatile organic compounds (VOCs), organic acids, hydrochloric acid, and water. Contact with this liquid may cause chemical burns, absorption through the skin, and eye, skin, and respiratory discomfort.

##### 4.8.2 Controls

- [A] All personnel will be familiar with the MSDS prior to operating the fire extinguisher.
- [B] All chemicals, which are used and/or stored near the GGTP system, shall have an MSDS.
- [C] Small quantities of chemicals allowed for storage are limited to those needed for routine operation of the GGTP system. Chemicals stored near GGT operations must be approved by Host site.
- [D] All personnel shall be familiar with the MSDS for chemicals they are handling.
- [E] Unwanted or expired chemicals shall be disposed in accordance with Host site-specific requirements.
- [F] Chemicals will be stored in appropriate containers **AND** labeled per Title 29 CFR 1910.1200, *Hazard Communication*.
- [G] All personnel shall wear PPE as specified when handling hazardous materials (Attachment 1).

- [H] Contact with condensation collected in bottom of canisters must be avoided. If any condensation is found, follow Host site Industrial Hygiene (IH) program.
- [I] Ventilation system must be operating in the building. Personnel must evacuate the building upon loss of ventilation.

#### 4.9 Safety Awareness Associated with Material Handling

- 4.9.1 Material handling practices shall conform to the requirements of each Host site related to health and safety for both material handling and forklift safety.
- 4.9.2 Drums staged within the GGT operational area for sampling purposes should not obstruct ingress or egress pathways.
- 4.9.3 Appropriate PPE will be worn as required by Host site-specific procedures.
- 4.9.4 Material handling aids (e.g., forklift, loader) shall be used whenever practicable **AND** whenever the material or drum weight exceeds 50 pounds or 1/3 body weight, whichever is less.
- 4.9.5 A trained and qualified person shall perform all handling of drums requiring forklifts. Use Host site personnel to provide this forklift function when required. Refer to the Host site requirements.
- 4.9.6 Warning labels and striped warning tape will be utilized, when applicable.
- 4.9.7 Personnel must maintain awareness of forklifts operating in the area. Backup alarms must be maintained, path of travel avoided, equipment inspected prior to use, **AND** approved rigging sketches used as applicable. Personnel must wear safety shoes, stay clear of container movements, **AND** maintain awareness of surroundings. Parts of the body must be kept from under suspended loads.
- 4.9.8 Personnel must follow Host site-specific Heat and Cold Stress program.
- 4.9.9 Hearing protection, safety glasses with side shields, and leather gloves must be used when operating impact wrenches. Extensions will be utilized whenever possible to reduce ergonomic stress to operators.
- 4.9.10 Hard hats must be worn when loading **AND** unloading canisters.

4.9.11 The analytical cart, which is on casters, is moved manually. Full cart weighs 150 lbs. Movement of the cart requires two-person operation.

4.10 Maintenance, Inspections, and Quality Assurance

4.10.1 All maintenance will be done in accordance with CCP-TP-140, *CCP Equipment Maintenance*, and Host site requirements.

4.10.2 The VPM and operators shall ensure all radiation monitoring equipment is functional and has current yearly calibrations.

4.10.3 Emergency lights shall have a functional check per Host site-specific procedures.

4.10.4 The VPM or GGT operators shall ensure all signs and warning lights are in place and functional before beginning any work.

4.10.5 All modifications or changes to the equipment shall be performed in accordance with CCP-CM-001, *CCP Equipment Change Authorization and Documentation*, and Host site-specific requirements.

4.10.6 Emergency response plans and procedures will be followed in accordance with Host site-specific procedures.

4.11 Personnel Safety and Barrier/Boundaries

4.11.1 The GGT area will be posted in compliance with DOE and Host site-specific requirements.

4.11.2 All personnel should be aware of radiological control zone barriers and postings.

4.11.3 Personnel operating the GGTP equipment shall wear dosimeters required by the Host site.

4.11.4 Personnel performing anything other than administrative work shall wear appropriate PPE as identified in the Host site requirements.

4.11.5 Personnel shall wear appropriate PPE according to Attachment 1 while working in the GGTP operational area.

#### 4.12 Visitor Requirements

4.12.1 Visitors that will be within the GGT operational area shall be briefed on the safety hazards associated with its operation.

4.12.2 Visitors shall follow the Host site-specific visitor's rules and regulations.

4.12.3 An employee familiar with the GGT operational area and its operation shall escort visitors. The employee will have been authorized by the Host site to serve as an escort.

4.12.4 It is also the responsibility of the escort to provide the visitor with a briefing of the associated radiation and safety hazards in the GGT operational area.

4.12.5 Visitors are required to wear dosimeters and PPE, as specified by the Host site.

4.12.6 Visitors must meet all Host site-specific visitor access requirements.

#### 4.13 Unattended Operations

4.13.1 Area will be posted when unattended.

4.13.2 The GGTCs heating operation may be left unattended during heating and generation operations (normally 10 days.)

4.13.3 The MGSS cart may be energized and the vacuum pump left running while unattended.

4.14 Miscellaneous Hazards

4.14.1 Slips, Trips, and Falls – Personnel must work with caution around ramps, pallets, and electrical cords. Personnel must be aware of standing water or wet spots.

4.14.2 Barcode Scanner presents a laser eye hazard. Eye contact with laser scanner beam must be avoided.

5.0 RECORDS

| 5.1 No records are generated as a result of this HSP.

Attachment 1 - Personal Protective Equipment Requirements

<b>Procedure</b>	<b>Operation/Conditions</b>	<b>Respiratory Protection</b>	<b>Protective Clothing</b>	<b>Dosimetry</b>
CCP-TP-083	Test canister loading and unloading	N/A	Leather gloves, safety glasses with side shields, safety shoes, and hard hats	Per RWP or equivalent
CCP-TP-083	Visible liquids during drum unloading	Per Host site IH direction	Per Host site IH direction	Per RWP or equivalent
CCP-TP-089	GGTP Sampling	N/A	Per Host site approved method of work (AMOW).	Per RWP or equivalent