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1-28-2019

### ISFSI Conduct of Radiation Protection

David Rybarczyk

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January 28, 2019

US Nuclear Regulatory Commission, Region 4  
Att. Robert J. Evans  
1600 East Lamar Blvd.  
Arlington, TX 76011-4511

Mr. Evans,

To keep affiliated agencies apprised of changes to emergency procedures at the PG&E Humboldt Bay Independent Spent Fuel Storage Installation (HB ISFSI) in Eureka California, a disk containing four (4) implementing procedures is enclosed. The disk contains:

HBI-200, ISFSI Conduct of Radiation Protection  
HBI-201, ISFSI Radiological Instruments and Surveys  
HBI-261, Emergency Event Response and Protective Actions  
HBI-262, ISFSI Response and Actions

Your department is referenced in the PG&E Humboldt Bay Emergency Plan as an agency that could be called upon to assist the site in the event of a significant emergency. These procedures outline what steps HB ISFSI staff would take during emergency situations, how the site would recover and what outside agencies would be involved. Please keep this disk on-file as reference material.

Site conditions continue to change as the decommissioning of the former Humboldt Bay Power Plant finish this year. The HB ISFSI will remain onsite long-term.

Thank you for accepting this material and for the assistance your department has given to the HB ISFSI. If you have any questions, please contact me.

Sincerely,

  
David Rybarczyk

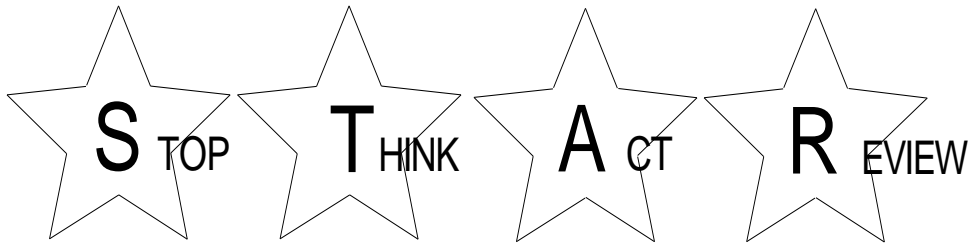
Docket 072-00027  
License SVM-2514

ML19304C674

**HBI-200**  
**ISFSI Conduct of Radiation Protection**  
**Rev. 3**

**QUALITY RELATED**

**Humboldt Bay ISFSI**



APPROVAL	
Approved By: _____	6/19/2018
ORIGINAL SIGNATURE ON FILE	Date
(Print / Sign)	
Effective Date:	7/3/2018



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None

**LIST OF FORMS**

None



## 1.0 PURPOSE

This procedure describes the Radiation Protection (RP) Program for the Humboldt Bay (HB) Independent Spent Fuel Storage Installation (ISFSI).

This procedure applies to personnel responsible for supporting the operations and maintenance of the HB ISFSI.

## 2.0 DEFINITIONS

- 2.1 ALARA - As low as reasonably achievable. Inspections and work activities at the ISFSI are planned to maintain radiation exposure ALARA.
- 2.2 Controlled Area - An area outside of a Restricted Area (ISFSI vault), but inside the Site Boundary, access to which can be limited by the licensee for any reason. The Security Area Fence is the boundary for the controlled area.
- 2.3 Dosimetry - Instruments or equipment used to monitor external dose, which may be direct or indirect reading (e.g., Thermoluminescent Dosimeter [TLD], and/or electronic dosimetry).
- 2.4 Dosimetry Processor - An individual or organization that processes and evaluates individual monitoring equipment in order to determine the radiation dose delivered to the equipment.
- 2.5 General Area - Term used in conjunction with radiological survey information to describe the overall radiological conditions in an area. When appropriate, this term is also applied to reflect the workers' immediate general area, which will include items or components being handled, in addition to the area being entered.
- 2.6 Radiation Area - An area accessible to individuals in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 5.0 mrem in 1 hour at 30 centimeters from the radiation source or from any surface the radiation penetrates.
- 2.7 Radiation Work Permit (RWP) - Document used to establish radiological work control requirements for routine and repetitive tasks (e.g., inspections, maintenance and radiological surveys).
- 2.8 Radioactive Material Area - Any area or room where there is stored an amount of licensed material exceeding 10 times the quantity of such material specified in Appendix C of 10 CFR 20.



- 2.9 Restricted Area - An area to which access is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive material. The ISFSI storage cask vaults are normally individually posted as Restricted Area boundaries at the vault lids.
- 2.10 Survey - An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.
- 2.11 Thermoluminescent Dosimeter (TLD) - A type of radiation dosimeter used as the primary method of determining the radiation dose.

### 3.0 REFERENCES AND COMMITMENTS

#### 3.1 References

- 3.1.1 10 CFR 19, “Notices, Instructions and Reports to Workers”
- 3.1.2 10 CFR 20, “Standards for Protection Against Radiation”
- 3.1.3 10 CFR 72, “Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High Level Radioactive Waste, and Reactor-Related Greater than Class C Waste”
- 3.1.4 Diablo Canyon Power Plant (DCPP) RP Program Directives, Administrative Procedures, and Radiation Control Procedures
- 3.1.5 HBI-102, “ISFSI Records and Documents”
- 3.1.6 HBI-107, “ISFSI Corrective Action Program”
- 3.1.7 HBI-L4, “Humboldt Bay Emergency Plan”
- 3.1.8 USNRC Regulatory Guide 8.34, “Monitoring Criteria and Methods to Calculate Occupational Radiation Doses”
- 3.1.9 Final Safety Analysis Report (FSAR)

#### 3.2 Commitments

- 3.2.1 There are no commitments implemented by this procedure.



#### 4.0 RESPONSIBILITIES

- 4.1 ISFSI Shift Manager (ISM) - Lead on-shift person responsible for ensuring DCPD Radiation Protection personnel are notified whenever an ISFSI evolution has occurred, or will occur, which would significantly change the radiological conditions in the facility. The ISM is also responsible for HB security training and qualifications for HB ISFSI emergency RP survey response.
- 4.2 DCPD Radiation Protection Manager (RPM) - PG&E management representative responsible for ensuring radiation protection standards are maintained. The DCPD RPM is responsible for providing DCPD RP Department personnel and support for HB ISFSI operations and work control activities, as needed, using the DCPD RP Program and procedures.
- 4.3 DCPD RP Department Personnel - PG&E employees and contractors responsible for the HB ISFSI operational and work control RP Program.
- 4.4 HB ISFSI Personnel - PG&E employees and contractors responsible for the HB ISFSI operations and maintenance activities.

#### 5.0 DISCUSSION

- 5.1 The HB RP Program in support of ISFSI operations is a minimal program supported by HB ISFSI Personnel to perform emergency or event triggering surveys for immediate RP response. Specific limitations are implemented to minimize personnel training requirements and program scope.
- 5.2 Radiological RP Program expertise and support are provided by the DCPD RPM and DCPD RP Department personnel utilizing the DCPD RP program and procedures.
- 5.3 There are no routine radiological effluent monitoring requirements associated with the routine operations of the ISFSI.
- 5.4 There are no NEI 07-07 Groundwater Protection Initiative (GPI) requirements or reporting associated with HB ISFSI.
- 5.5 There is no radiological respiratory protection program associated with the routine operations of the ISFSI.
- 5.6 The ISFSI design is a subsurface welded confinement with no potential for leakage under routine operating conditions. In the shielded vault configuration, area dose rates are less than 15  $\mu$ R/hr (less than 0.015 mRem/hr). Therefore, individual monitoring for ISFSI personnel and visitors is not required.



- 5.7 The ISFSI storage cask vaults are posted as individual Restricted Areas. Additional radiological postings for unanticipated emergency conditions are available to HB ISFSI Personnel.
- 5.8 Radiological instrumentation available to HB ISFSI Personnel provides capability to identify dose rates, contamination levels and the presence of airborne radioactive materials in emergency response conditions. This instrumentation is provided by, and controlled via, DCPD RP Program controls and is also available to DCPD RP Department Personnel when performing routine and work control surveys at HB ISFSI.
- 5.9 Radioactive material control at the ISFSI is limited to exempt quantity<sup>1</sup> sources of Cs-137 and Tc-99 for instrument response checks. These sources are inventoried and controlled via DCPD RP Program controls.
- 5.10 Radioactive waste is not expected to be generated at the ISFSI. Expended consumables (air sample media or smear samples) collected as a routine should result in no radioactivity being found, other than naturally-occurring radionuclides.
- 5.11 Records associated with 10 CFR 20, Subpart L (e.g., surveys, dose to individual members of the public, waste disposal, etc.) are processed in accordance with DCPD procedures and where applicable using HB procedure HBI-102, "ISFSI Records and Documents".
- 5.12 All personnel are expected to exercise "stop work" authority whenever situations occur which can result in an unacceptable threat to radiological safety. This can include an unusual worsening of radiological conditions, exceeding established control measures, lack of ALARA in work planning or conduct, or unknown conditions.
- 5.13 Access control to the vicinity of the vault lids is provided by a perimeter Security Area Fence. Access within the Security Area Fence is not limited for the purpose of routine radiation exposure control; therefore, no radiation work permit is required for routine access within the Security Area Fence while the cask vault lids are in place.

## 6.0 PREREQUISITES

None

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<sup>1</sup> Exempt quantity source limits are found in 10 CFR 30.71, Schedule B, and are exempt from leak testing requirements under 10 CFR 30.18(a). However, upon removal of the sources from service or replacement of the sources, consult DCPD Radiation Protection to determine appropriate disposal actions.





## 7.0 INSTRUCTIONS

### 7.1 HB ISFSI Personnel Radiological Training and Qualification

7.1.1 At least one member of the on-shift ISFSI staff shall be trained and qualified to:

- a. Perform emergency response radiological surveys.
- b. Collect and record radiological data.
- c. Perform initial emergency response radiological decisions.
- d. Take initial mitigating action as needed to support HBI-L4, "Humboldt Bay Emergency Plan" implementation.

7.1.2 HB ISFSI Personnel shall be trained and qualified to perform assigned tasks in accordance with HB procedures.

7.1.3 Additional radiological technical support is provided through the DCPD RP Program, DCPD RP Procedures, and DCPD RP Supervision.

7.1.4 In accordance with DCPD RP procedures, HB ISFSI Restricted Area access is limited to those personnel who currently possess a DCPD radiation worker qualification.

### 7.2 External and Internal Occupational Dose Control

7.2.1 Exposure to HB ISFSI Personnel from routine operations is expected to be less than would require individual exposure monitoring required by 10 CFR 20.1502.

7.2.2 Environmental TLD monitoring provides for periodic confirmation that individual monitoring is not required. No individual monitoring for external or internal occupational dose is required outside of the ISFSI vault Restricted Area for normal operations.

7.2.3 Expected dose rates outside of the ISFSI vault Restricted Area are at or near background levels, with a general area dose rate typically less than 15  $\mu$ R/hr (less than 0.015 mR/hr).

- a. If general area dose rates exceed 50  $\mu$ R/hr (greater than 0.050 mR/hr), the ISM shall contact the DCPD RPM to investigate and evaluate the potential to exceed 100 mrem in a year.



## CAUTION

Dose rates greater than 300  $\mu\text{R/hr}$  (greater than 0.3 mRem/hr) with the vault lids installed indicate potential damage to a confinement boundary.

- b. ISFSI Personnel shall notify the ISM if general area dose rates are greater than 300  $\mu\text{R/hr}$  (0.3 mRem/hr).
- 7.2.4 Expected contact dose rates inside of the ISFSI vault at the overpack lid are less than 5 mR/hr (based on dose rates taken at initial cask loading).
- a. RP Program support within the HB ISFSI vaults is provided by DCPD RP Department Personnel, the DCPD RP Program, and DCPD RP procedures.
  - b. Exposure monitoring within the Restricted Area should be considered occupational exposure and is monitored using DCPD RP procedures.
  - c. DCPD RP Personnel shall notify the ISM if internal vault contact dose rates at the overpack lid are greater than 19.8 mR/hr.

## CAUTION

Dose rates greater than 19.8 mRem/hr on contact with the overpack lid (vault lid removed) indicate potential damage to a confinement boundary.

### 7.3 Radiological Environmental Monitoring Program

#### NOTE

The Radiological Environmental Monitoring Program is used to monitor and control dose to members of the public.

- 7.3.1 There are no active gaseous or liquid effluent systems associated with the ISFSI vault.
- 7.3.2 Environmental (Env) TLDs are maintained in the vicinity of the ISFSI Security Area Fence and the ISFSI Site Boundary perimeter by DCPD RP Department Personnel.
- 7.3.3 Env TLD processing and programmatic controls are governed by DCPD Procedure RP1.ID11, "Environmental Radiological Monitoring Procedure" and DCPD Procedure RCP EM-3, "Use of Environmental Thermoluminescent Dosimeters".
- 7.3.4 Env TLDs are exchanged periodically and processed in accordance with DCPD Procedure RCP EM-3, "Use of Environmental Thermoluminescent Dosimeters".



- 7.3.5 Env TLD results are required to be determined per the ISFSI Technical Specification 5.1.2 requirement to provide monitoring in support of the requirements of 10 CFR 72.44(d)(2) and 10 CFR 72.126(c)(2).
  - 7.3.6 Dose assessments from the Env TLD data are performed by DCPD RP Department Personnel or other contracted radiological vendor support personnel.
  - 7.3.7 Dose assessment results are used as confirmatory monitoring points to validate that individual occupational monitoring is not required, per 10 CFR 20.1502, and to Assess Emergency Dose and Assess Dose to the Public.
  - 7.3.8 The requirements of 10 CFR 72.126(c)(1) are determined under accident conditions via air sampling.
- 7.4 Postings, Surveys and Monitoring
- 7.4.1 Routine and Work Control radiological surveys are performed periodically by DCPD RP Department Personnel using DCPD RP Program procedures, processes, instrumentation and equipment. These radiological surveys and postings support the ISFSI FSAR.
  - 7.4.2 HB ISFSI Personnel emergency response instrumentation is available and provides the capability to identify emergency response initial radiation levels, contamination levels, and evaluation of airborne radioactivity.
  - 7.4.3 Contamination discovered during a survey should be documented per DCPD RP Procedures and HBI-107, "ISFSI Corrective Action Program", for evaluation by the DCPD RPM and further consideration under 10 CFR 72.30(f).
- 7.5 Radiological Survey Instrumentation
- 7.5.1 The HB ISFSI Personnel radiological instrumentation capability at the HB ISFSI has been selected to provide indication of emergency response radiological conditions and an assessment of the radiological hazard during emergency response conditions.
  - 7.5.2 The HB ISFSI radiological instrumentation is source checked by qualified onsite HB ISFSI Personnel (or DCPD RP Department Personnel) and is periodically calibrated in accordance with the DCPD Radiological Instrument Control Program Procedure RP1.DC5, "Radiation Protection Instrumentation Calibration Program".



- 7.5.3 Selected HB ISFSI Personnel shall be trained and qualified in the use of emergency response RP instrumentation prior to monitoring for radiation or conducting radiological surveys. The selection of HB ISFSI Personnel to be trained shall ensure that at least one person will be qualified to perform the emergency response radiological surveys in any given shift.
- 7.5.4 Routine and Work Control radiological survey instrumentation used by DCPD RP Personnel is controlled and calibrated using the DCPD RP Program and DCPD RP procedures.
- 7.6 Work Control in Restricted Areas
- 7.6.1 The Restricted Area is routinely posted at the HB ISFSI vault lids. The Restricted Area boundary can be moved by DCPD RP Personnel during work control activities.
- 7.6.2 Permanent changes to Restricted Area boundaries shall be updated within the HB ISFSI updated FSAR.
- 7.6.3 Removal of a vault lid or personnel access below the plane of the vault lid requires a RWP, in accordance with DCPD Procedure RP1.ID9, "Radiation Work Permits".
- 7.6.4 RP surveys, personnel monitoring, postings and Restricted Area access are controlled by the DCPD RP Program and DCPD RP procedures.
- 7.7 Radioactive Material Control and Radioactive Waste Disposal
- 7.7.1 Expended consumables (e.g., smears or air sample media) collected and assessed by HB ISFSI personnel as a part of a emergency condition will be assessed and disposed of as follows:
- a. Potentially contaminated expended consumables with results greater than 100 net counts per minute (ncpm) shall be placed in a sealable plastic bag.
  - b. The plastic bag shall be labeled with the date(s) the contents were expended and the reason they were expended (e.g., routine survey, emergency response).
  - c. The plastic bag shall be stored in a secure storage location, as determined by the ISM.
  - d. The DCPD RPM shall be contacted for further guidance.
- 7.7.2 Consumables (e.g., smears or air sample media), plastic bags and other materials used for training shall not contain a trefoil or other radiological posting.



7.7.3 Expended consumables (e.g., smears or air sample media) collected and assessed as a part of a training exercise may be discarded as normal trash.

7.7.4 Radioactive Material Control and Radioactive Waste Disposal will be conducted in accordance with the DCPD RP Program and DCPD RP procedures.

## 7.8 Release of Radioactive Material

7.8.1 Potentially radioactive material shall not be released for unrestricted use by HB ISFSI Personnel.

7.8.2 The DCPD RPM shall provide guidance and direction for shipping and release of any radioactive or suspected radioactive material utilizing DCPD RP Program controls.

## 7.9 As Low As Reasonably Achievable (ALARA) Program

7.9.1 The HB ISFSI utilizes the DCPD ALARA program to maintain radiation exposures to HB ISFSI personnel, visitors, and the general public below regulatory limits and as low as reasonably achievable.

7.9.2 The ALARA Program is implemented through the DCPD work control process by DCPD RP Department Personnel when access to the HB ISFSI Restricted Area is required.

## 8.0 RECORDS

There are no records generated by this procedure. Any records mentioned in this procedure are addressed by the specific procedure that generates them.

## 9.0 ATTACHMENTS

None

## 10.0 FORMS

None

# HBI-201 ISFSI RADIOLOGICAL INSTRUMENTS AND SURVEYS

Rev. 3

QUALITY RELATED

## Humboldt Bay ISFSI



APPROVAL	
Approved By: _____	6/1/2017
(Print / Sign)	Date
Effective Date:	6/19/2017



Summary of changes in this revision:

Changed revision number from 2 to 3 throughout the procedure.

Clarified procedure purpose as ISFSI personnel performing surveys in a potential emergency situation.

Added “Circle slash method should be used for each step” prior to Step 7.2.

Added significant clarifying information throughout “Section 7.0 Instructions” for:

Instrument pre-use check documentation and placing an instrument out of service if needed.

How to perform and document radiation dose rate surveys and the actions to be taken based on survey results.

How to perform, determine results, and document contamination and airborne radioactivity surveys and the actions to be taken based on survey results.

Relocated information on radioactive source storage from calibration section to pre-use check section.

Attachments A, B, and C:

Relocated the “Operation of the Instrument” section so that it is now after “Precautions” and before “Pre-Use Checks.”

Added reference to procedure section for information on pre-use check failure and pre-use check documentation in Pre-Use Check section.

At the end of each Pre-Use Check section, added reference to procedure section for performance of applicable survey (i.e., “Refer to Section 7.3 for Performing a Radiation Survey Using a RadEye-G” would be found in Attachment A).

Attachments A and B:

Added statement to return Source Jig to its proper storage location when finished.

Added clarifying information to Attachment A for:

Turning RadEye on/off and battery replacement.

Performance of source check including acceptance criteria and use of Source Jig.

Returning source jig to storage location when done.

Added clarifying information to Attachment B for:



Battery charging and who performs battery replacement.

How to count a smear and actions if a full-scale deflection is obtained.

How to store the instrument when it is not in use.

Source check process including new pictures added to Pre-Use Check section showing the source check performance. The old pictures of the source are now removed.

Added clarifying information to Attachment C for:

Operation of the Radeco HD-29A including new pictures showing the sample head, filter paper, and installed sample head on air sampler.

Modified Form HBI-201-F-1, ISFSI Radiological Survey to:

Make the survey map and instrument check sections larger.

Remove "Routine" and "Recovery" as options for survey purpose.

Make information on typical dose rates, dose rate units, how contact and general area dose rates, smears, and air samples are documented more understandable. Draw attention to the ALERT dose rate threshold.

The section for adding tarps or shielding to a cask(s) was moved to the top of the "Comments" section on the second page.





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## **LIST OF ATTACHMENTS**

Attachment A, Use of the RadEye-G

Attachment B, Use of the Ludlum Model 177

Attachment C, Use of the Radeco HB-29A Air Sampler

## **LIST OF FORMS**

Form HBI-201-F-1, “ISFSI Radiological Survey”



## 1.0 PURPOSE

This procedure provides instruction for the preparation and use of radiological survey instruments used at the Humboldt Bay (HB) Independent Spent Fuel Storage Installation (ISFSI) for performing radiological surveys by HB ISFSI personnel in a potential emergency situation.

## 2.0 DEFINITIONS

- 2.1 As Low as Reasonably Achievable (ALARA) – The regulatory requirement and PG&E position related to radiation exposure to workers and the general public. ALARA is practiced during ISFSI maintenance and operations.
- 2.2 Counts per minute (cpm) – The measure of the detection rate of ionizing events per minute.
- 2.3 General Area - Term used in conjunction with radiological survey information to describe the overall radiological conditions in an area. When appropriate, this term is also applied to reflect the workers' immediate general area, which will include items or components being handled in addition to the area being entered.
- 2.4 Radiation Area - An area accessible to individuals in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 5.0 mRem in 1 hour, at 30 centimeters from the radiation source, or from any surface the radiation penetrates.
- 2.5 Radioactive Material Area - Any area or room where there is stored an amount of licensed material exceeding 10 times the quantity of such material specified in Appendix C of 10 CFR 20.
- 2.6 Restricted Area - An area to which access is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive material.
- 2.7 Survey - An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.
- 2.8 Thermoluminescent Dosimeter (TLD) - A type of radiation dosimeter used as the primary method of determining the radiation dose.



### 3.0 REFERENCES AND COMMITMENTS

#### 3.1 References

- 3.1.1 Diablo Canyon Power Plant (DCPP) Procedure RCP D-970, “Radiation Protection Instrument Calibration Schedule”
- 3.1.2 DCPP Procedure RP1.DC5, “Radiation Protection Instrumentation Calibration Program”
- 3.1.3 HBI-102, “ISFSI Records”
- 3.1.4 HBI-106, “ISFSI Training Program”
- 3.1.5 HBI-107, “ISFSI Corrective Action Program”
- 3.1.6 HBI-261, “Emergency Event Response and Protective Actions”

#### 3.2 Commitments

There are no commitments implemented by this procedure.

### 4.0 RESPONSIBILITIES

- 4.1 DCPP Radiation Protection Manager (DCPP RPM) - The designated management expert on radiation protection responsible for establishing, managing and monitoring implementation of the Radiation Protection Program and procedures.
- 4.2 DCPP RP Supervision - Provides additional radiological technical support.
- 4.3 ISFSI Shift Manager (ISM) - Serves as the on-shift management oversight to the ISFSI staff, programs and facility.

### 5.0 DISCUSSION

- 5.1 Calibration and repair or replacement of instrumentation is through the Diablo Canyon Power Plant (DCPP) Radiological Instrument Control Program addressed in DCPP procedure RP1.DC5, “Radiation Protection Instrumentation Calibration Program” and supported by DCPP RPM and RP instrumentation personnel.
- 5.2 Radiological instrumentation available to the ISFSI provides the capability to measure dose rates (RadEye-G), contamination levels (frisker - Ludlum 177) and the presence of airborne radioactive materials (Radeco HD-29A and frisker).



- 5.3 Exempt quantity<sup>1</sup> sources of Cs-137 and Tc-99 are available for instrument source checks. Personal dosimetry is not required for the use of these sources.
- 5.4 The actions in this procedure are those of ISFSI personnel trained and qualified to perform the tasks, unless otherwise specified.

## 6.0 PREREQUISITES

- 6.1 Personnel using this procedure shall be trained and qualified in the use of the instruments and survey techniques in accordance with the requirements of HBI-106, "ISFSI Training Program".

## 7.0 INSTRUCTIONS

- 7.1 Calibration of Radiological Instruments
- 7.1.1 Radiological instruments used at the HB ISFSI are calibrated in accordance with DCPD Procedure RP1.DC5, "Radiation Protection Instrumentation Calibration Program".
- 7.1.2 The calibration frequency for radiological instruments used at the HB ISFSI is defined in DCPD Procedure RCP D-970, "Radiation Protection Instrument Calibration Schedule".

### NOTE

Steps 7.2.1, 7.2.2 and 7.2.3 may be performed in any order, concurrently or individually.

**(Circle slash method should be used for each step)**

- 7.2 Pre-Use Inspection of Radiological Instruments
- 7.2.1 Perform pre-use checks on the RadEye-G in accordance with the guidance in Attachment A, Use of the RadEye-G. N/A if RadEye-G is not used.
- 7.2.2 Perform the pre-use checks on the Ludlum 177 in accordance with the guidance in Attachment B, Use of the Ludlum Model 177. N/A if Ludlum 177 is not used.

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<sup>1</sup> Exempt quantity source limits are found in 10 CFR 30.71, Schedule B, and are exempt from leak testing requirements under 10 CFR 30.18(a). However, upon removal of the sources from service or replacement of the sources, consult DCPD Radiation Protection to determine appropriate disposal actions.



7.2.3 Perform the pre-use checks on the Radeco HD-29A and associated flow meter in accordance with the guidance in Attachment C, Use of the Radeco HD-29A Air Sampler. N/A if Radeco HD-29A is not used.

7.2.4 If the instrument fails any of the pre-use checks:

- a. Remove the instrument from service and attach a completed instrument tag,
- b. Notify the ISM,
- c. Initiate a SAPN in accordance with HBI-107, “ISFSI Corrective Action Program”.

7.2.5 Record pre-use check results on Form HBI-201-F-1, “ISFSI Radiological Survey” as follows:

- a. Instrument Model (ex. RadEye-G, Ludlum M-177, Radeco HD-29A).
- b. RP Serial No. (DCPP instrument serial no. located on the instrument, ex. 03.32.xxx for a RadEye-G, 01.14.xxx for a Ludlum M-177, etc.).
- c. Cal Due (Calibration due date found on calibration sticker located on the instrument).
- d. Pre-Use Check SAT/UNSAT (Indicate the appropriate box for each instrument checked).

7.2.6 Radioactive sources used for source checks of radiological instruments should remain in a locked facility or container when not in use.

**NOTE**

Sections 7.3, 7.4, and 7.5 may be performed in any order or concurrently.

7.3 **Radiation Survey with the RadEye-G**

7.3.1 Obtain a Form HBI-201-F-1, “ISFSI Radiological Survey”.

7.3.2 Obtain a RadEye-G and ensure the pre-use checks have been performed in accordance with Step 7.2 applicable steps.

7.3.3 **Measure the contact dose rates at the lid of each vault, and the general area dose rates at several locations along the Security Area fence as follows:**

- a. Contact dose rates taken on vault lids should be away from the edge of the vault lid and more toward the middle of the vault lid.



- b. General area dose rates are taken while holding the RadEye-G at approximately waist level.

7.3.4 Dose rates at HB ISFSI are in units of micro-R/hr ( $\mu\text{R/hr}$ ) unless otherwise specifically identified on the survey form. Record the dose rate information on Form HBI-201-F-1, "ISFSI Radiological Survey" as follows:

- a. Annotate the location of each contact and general area dose rate on Form HBI-201-F-1, "ISFSI Radiological Survey".
- b. Contact dose rates are documented using an asterisk (ex, \*12 means 12  $\mu\text{R/hr}$  on contact). No dose rate unit required if  $\mu\text{R/hr}$ .
- c. General area dose rates are documented by using only the dose rate (ex, 12 means 12  $\mu\text{R/hr}$ ). No dose rate unit required if  $\mu\text{R/hr}$ .
- d. If radiation dose rate is in units of milli-Rem/hr or Rem/hr, then mR/hr or R/hr will follow the dose rate information in 7.3.4.b and 7.3.4.c above. (ex, \*1.2 mR/hr means 1.2 milli-Rem/hr on contact)

### CAUTION

Dose rates greater than 300 micro-R/hr ( $>0.3$  mRem/hr) indicate potential damage to a confinement boundary.

7.3.5 Inform the ISM of the readings.

- a. If dose rates on, or near, any vault lid are greater than 300  $\mu\text{R/hr}$  (0.3 mRem/hr), the ISM shall immediately refer to HBI-261, "Emergency Event Response and Protective Actions".
- b. The ISM shall contact the DCPD RP Supervisor if general area dose rates exceed 50  $\mu\text{R/hr}$  ( $>0.050$  mR/hr) to investigate and evaluate the potential to exceed 100 mRem in a year.
- c. The ISM shall implement any actions identified by the DCPD RP Supervisor.

## 7.4 Contamination Survey at the ISFSI

7.4.1 Obtain fresh smear papers and a Ludlum Model 177.

7.4.2 Ensure the daily pre-use checks have been performed on the Ludlum Model 177 in accordance with Step 7.2 applicable steps.

7.4.3 Obtain smear samples on and around the vault lids and annotate the location of each smear on Form HBI-201-F-1, "ISFSI Radiological Survey" as follows:



- a. Wipe a smear over an area of approximately 100 cm<sup>2</sup> (approximately 16 square inches) using moderate pressure throughout the wipe process. Repeat this for each vault lid and selected areas between and around vault lids. Pay particular attention to areas that may indicate potential damage.
- b. Each smear location will be indicated on Form HBI-201-F-1, "ISFSI Radiological Survey" with the smear number (1, 2, 3, etc.) inside a circle.
- c. Smears should not be taken in standing water or if raining.

7.4.4 Count each smear with the Ludlum Model 177 and record the results on survey Form HBI-201-F-1, "ISFSI Radiological Survey" as follows:

- a. Ensure the Fast/Slow toggle switch is in the "Slow" position, the scale indicator in on the "x1" scale, and volume is at the desired level on the Ludlum 177.
- b. Note the background count rate on the Ludlum 177 and annotate this value in the "Background Count Rate (cpm)" location on Form HBI-201-F-1, "ISFSI Radiological Survey", if not already done.
- c. Hold the Ludlum 177 probe approximately ½" above the smear being careful not to make contact. Read the results in counts per minute (cpm) indicated on the Ludlum 177 scale.
- d. If an indication of radioactivity is present (i.e., Ludlum 177 meter indication starts increasing) allow sufficient time for full deflection to be reached. If a full-scale deflection is obtained on the x1 scale, switch to the x10 scale. The scale reading must now be multiplied by 10. If it were necessary to use the x100 scale then the reading would be multiplied by 100, and if the x1K scale is used, the reading would be multiplied by 1,000.
- e. In the section titled "Smear Information (cpm/100 cm<sup>2</sup>)" on Form HBI-201-F-1, "ISFSI Radiological Survey", list the smear numbers and results. Smear numbers shall coincide with the smear locations on the map and the results will be the Ludlum 177 reading in cpm. Do not subtract background from the meter reading.

7.4.5 Inform the ISM of the results:

- a. The ISM shall contact the DCPD RP Supervisor if any smear reads greater than 100 cpm above background. See also Step 7.4.6 below.
- b. The ISM shall implement any actions identified by the DCPD RP Supervisor.



7.4.6 Expended potentially contaminated consumables (e.g., smears greater than 100 cpm above background) collected and assessed as a part of a radiological survey will be disposed of as follows:

- a. Potentially contaminated expended consumables shall be placed in a sealable plastic bag.
- b. The plastic bag shall be labeled with the date(s) the contents were expended and the reason they were expended (e.g., emergency response).
- c. The plastic bag shall be stored in a secure storage location, as determined by the ISM.
- d. The DCPD RPM shall be contacted by the ISM for further guidance.

## 7.5 **Air Sampling at the ISFSI.**

7.5.1 Obtain fresh air sample filter papers, air sample head, Radeco HD-29A and a Ludlum Model 177.

7.5.2 Ensure the daily pre-use checks have been performed in accordance with Step 7.2 applicable steps.

7.5.3 Operate Radeco HD-29A to collect an air sample for approximately 10 minutes at 2 cubic feet/minute (cfm) as follows:

- a. Install a fresh air sample filter paper in a sample head such that the shiny long fiber backing is downstream of the air flow. (Dull side faces out and shiny side faces into the sample head.) Ensure no gaps are present between the filter paper and the sample head where air could move through the sample head without being filtered.
- b. Attach the sample head to the air sampler flow meter.
- c. Move the air sampler to the desired location inside the Security Area for drawing the air sample. This would include being **downwind of the vaults and between the concrete and the Security Area fence.** Should any damage be observed at or near a specific vault, the air sampler should be positioned close to, or on, the concrete pad downwind from that vault.
- d. Turn on the air sampler and note the start time and initial flowrate. The flow rate should be 2 cfm as indicated on the instrument flow rotometer.
- e. Run air sampler for 10 minutes, verify flow rate still 2 cfm, then turn it off.





7.5.4 Obtain a gross count rate on the air sample filter paper, using the Ludlum Model 177 in a low background area as follows:

- a. Ensure the Fast/Slow toggle switch is in the “Slow” position, scale indicator is on the “x1” scale, and volume is at the desired level on the Ludlum 177.
- b. Note the background count rate on the Ludlum M-177 and annotate this value in the “Background Count Rate (cpm)” location on Form HBI-201-F-1, “ISFSI Radiological Survey”, if not already done.
- c. Hold the Ludlum 177 probe approximately ½” above the air sample filter being careful not to make contact. Read the results in counts per minute (cpm) indicated on the Ludlum 177 scale.
- d. If an indication of radioactivity is present (i.e., Ludlum 177 meter indication starts increasing) allow sufficient time for full deflection to be reached. If a full-scale deflection is obtained on the x1 scale, switch to the x10 scale. The scale reading must now be multiplied by 10. If it were necessary to use the x100 scale then the reading would be multiplied by 100, and if the x1K scale is used, the reading would be multiplied by 1,000.

7.5.5 Record the data results on Form HBI-201-F-1, “ISFSI Radiological Survey” as follows:

- a. Air sample location will be indicated on Form HBI-201-F-1, “ISFSI Radiological Survey” by drawing a triangle at the air sample location.
- b. In the section titled “Air Sample Information (cpm/100 cm<sup>2</sup>)” on Form HBI-201-F-1, “ISFSI Radiological Survey”, show the volume in cubic feet. This should be 20 since the air sample is to be run for 10 minutes at 2 cfm.
- c. The “Initial Count (cpm)” is the Ludlum 177 reading when analyzing the air sample filter paper. Do not subtract the background cpm from this reading.
- d. If the air sample filter paper contains 100 cpm or greater, above background, then it must be controlled per Step 7.5.11.
- e. If the initial count was less than 2,000 cpm no further action or air sample survey entries are required.



## CAUTION

Air sample count rates greater than 20,000 cpm above back-ground indicate potential damage to a confinement boundary.

- 7.5.6 If initial count rate is greater than 20,000 cpm;
- Immediately notify the ISM.
  - If the corresponding dose rate on, or near, any vault lid is greater than 300  $\mu\text{R/hr}$  ( $>0.3$  mRem/hr), the ISM shall immediately refer to HBI-261, “Emergency Event Response and Protective Actions”, Or
  - If the corresponding contact dose rates taken on all vault lids are less than 300  $\mu\text{R/hr}$  ( $<0.3$  mRem/hr), the ISM shall notify DCPD RP Supervision of the air sample and dose rate results, And
  - The ISM shall implement any actions identified by the DCPD RP Supervisor.
- 7.5.7 If initial count rate is greater than 2,000 cpm and less than 20,000 cpm, immediately NOTIFY the ISM.
- 7.5.8 Perform check for short-lived radioactive constituents. N/A if initial count rate is less than 2,000 cpm or greater than 20,000 cpm.
- Recount the air sample as indicated above after 30 minutes using the Ludlum 177 and record the reading on Form HBI-201-F-1, “ISFSI Radiological Survey” in the “Air Sample Information” section, “30-min count (cpm)” box. Do not subtract background cpm from this reading.
  - Recount the air sample after an additional 30-minute wait and record the Ludlum 177 reading in the “60-min count (cpm)” box. Do not subtract background cpm from this reading.
- 7.5.9 If the air sample data is greater than 2,000 cpm after the two recounts described in 7.5.8.a and b have been completed, notify the ISM.
- 7.5.10 The ISM shall take the appropriate action as follows:
- If the corresponding dose rate on, or near, any vault lid is greater than 300  $\mu\text{R/hr}$  ( $>0.3$  mRem/hr), the ISM shall immediately refer to HBI-261, “Emergency Event Response and Protective Actions”, Or
  - If the corresponding contact dose rates taken on all vault lids are less than 300  $\mu\text{R/hr}$  ( $<0.3$  mRem/hr), the ISM shall notify DCPD RP Supervision of the air sample and dose rate results, And
  - The ISM shall implement any actions identified by the DCPD RP Supervisor.



7.5.11 Expended potentially contaminated consumables (e.g., air sample filter papers greater than 100 cpm above background) collected and assessed as a part of a radiological survey will be disposed of as follows:

- a. Potentially contaminated expended consumables shall be placed in a sealable plastic bag.
- b. The plastic bag shall be labeled with the date(s) the contents were expended and the reason they were expended (e.g., emergency response).
- c. The plastic bag shall be stored in a secure storage location, as determined by the ISM.
- d. The DCPD RPM shall be contacted by the ISM for further guidance.

7.6 Records Review

7.6.1 The ISM shall forward the completed Form HBI-201-F-1, "ISFSI Radiological Survey" to the ISFSI Manager.

7.6.2 The ISFSI Manager shall review the data recorded for legibility and completeness.

7.6.3 The ISFSI Manager shall approve the completed Form HBI-201-F-1, "ISFSI Radiological Survey", if acceptable.

**8.0 RECORDS**

The following record is generated as a result of performance of this procedure and shall be retained in accordance with HBI-102, "ISFSI Records".

DOCUMENT	RESPONSIBILITY
Completed Form HBI-201-F-1, "ISFSI Radiological Survey"	ISFSI Manager

**9.0 ATTACHMENTS**

Attachment A, Use of the RadEye-G

Attachment B, Use of the Ludlum Model 177

Attachment C, Use of the Radeco HD-29A Air Sampler

**10.0 FORMS**

Form HBI-201-F-1, "ISFSI Radiological Survey"

**Attachment A, Use of the RadEye-G  
(Circle slash method should be used for each step)**

**Precautions**

1. Do not use the RadEye-G if you see an error message on the screen.
2. Consider locking the keys when wearing the RadEye-G in its holster in order to reduce battery time.

**Operation Of The Radeye-G**

(NOTE: A RadEye-G is shown below.)

1. Turn the instrument on by pressing the **ON** key for at least one second.
2. Perform a battery test by verifying the battery icon is partially or completely darkened.
3. Replace batteries as necessary. Instrument uses two AAA batteries and battery compartment is located on the back of the instrument.
  - a. When battery icon is outlined but not darkened at all and is followed by “Low Batt” on the screen, batteries need to be replaced.
  - b. In case of a failure or if the battery voltage is low, the beeper generates a sharp single pulse every 32 seconds.
4. Turn the RadEye OFF when not in use. Press the “MENU” button a total of 3 times as follows:
  - a. Press **MENU**. Verify “Switch OFF” option is highlighted in the screen. If not, select “Switch OFF” using up/down arrow keys.
  - b. Press **MENU**. Verify “Are you sure” shows in screen.
  - c. Press **MENU**. Verify instrument shuts off.



**NOTE**

Pre-use inspections of radiological instruments are only required on the days that the instruments are used and are required at least once each calendar day while in use.

**Pre-Use Checks**

1. Verify the instrument has a current calibration sticker.
2. Examine the instrument for any obvious physical damage which may affect the operability.
3. Perform a battery test by verifying the battery icon is completely or partially darkened when the instrument is ON. Reference “Operation of the RadEye-G” in this attachment. Battery replacement, if needed, can be performed by the individual who is performing the pre-use checks. A battery replacement that results in the battery icon showing completely or partially darkened when the instrument is ON is also indication of a satisfactory battery test.
4. Perform a source check using the source jig for the RadEye-G as follows:
  - a. RadEye Source Jig ready to receive RadEye for source check on the mR/hr scale on the left, and with the RadEye in place on the right in the figures below.



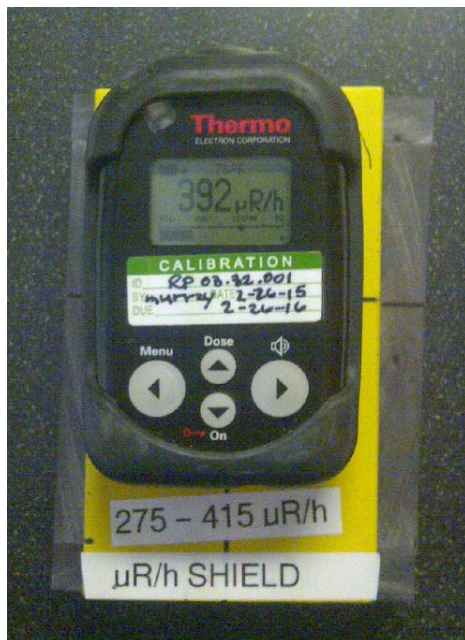
**Note:** Acceptance criteria is shown on the jig below the instrument. (In this case the acceptance criteria is 4.90 – 7.38 mR/hr). The source check result should fall between 4.90 and 7.38 mR/hr if using this source. Verify the RadEye reading is in mR/hr.

- b. RadEye Source Jig ready to install shield for source check on the micro-R/hr ( $\mu\text{R/hr}$ ) scale is shown in the figure on the left below.



**Note:** The Source Jig is inverted from previous configuration. Micro-R/hr ( $\mu\text{R/hr}$ ) shield is shown in figure on the right above. Install shield by aligning crosshairs on the shield and on the Source Jig.

- c. Place the RadEye on the installed Source Jig shield as shown in the figure below.



**Note:** Acceptance criteria is below the instrument on the shield. (In this case the acceptance criteria is 275 – 415  $\mu\text{R/hr}$ ). The source check result should fall between 275 and 415  $\mu\text{R/hr}$  if using this source. Verify the RadEye reading is in  $\mu\text{R/hr}$ .

- d. Return the Source Jig with source shield to the proper storage location when finished.



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5. Any dose rates that do not fall within the range listed on the source jig are considered UNSAT. The meter shall be removed from service if it fails any pre-use check. Refer to Section 7.2 applicable steps for instructions on removal of instrument from service.
6. Document results of pre-use checks in the appropriate location on Form HBI-201-F-1, "ISFSI Radiological Survey". Refer to Section 7.2 applicable steps for instructions on this documentation.

**REFER TO SECTION 7.3 FOR PERFORMING A RADIATION SURVEY USING A RADEYE-G.**

**Attachment B, Use of the Ludlum Model 177  
(Circle slash method should be used for each step)**

**Precautions**

1. Always turn the instrument off before changing detector probes.
2. Always perform a source check after changing probes.
3. Geiger Muller (GM) pancake-type instruments are generally insensitive to alpha radiation and should not be depended upon for alpha detection.
4. GM pancake-type instruments are generally insensitive to gamma radiation with the typical gamma efficiency <2% and are not used for gamma exposure readings.
5. GM pancake tube is very thin and great care must be taken to avoid physical shock to the probe during survey.
6. If battery is changed or replaced, a source check is required. Battery should be changed or replaced by the DCPD RP organization.
7. Ensure the Ludlum 177 probe protective cover is removed prior to use.



**Operation of the Ludlum M177**

1. The Ludlum M177 is normally left plugged in and turned on to charge the battery. There is an on/off switch located in the lower left hand area on the front of the instrument.
2. Set the appropriate range (start on the X1 range) with the range selector.





3. If a full-scale deflection is obtained on the X1 scale, switch to the X10. The scale reading must now be multiplied by 10. Continue upward through the X100 and X1k (1,000) scales if necessary, remembering to multiply the scale reading accordingly.
4. Adjust the VOLUME knob to obtain the desired audible count rate sound level.
5. Select the desired response setting, FAST or SLOW. In the FAST position, the instrument responds to 90% of full scale in 2.2 seconds and in SLOW, the instrument responds to 90% of full scale in 22 seconds. The SLOW response is the preferred setting.
6. The HV TEST button may be pressed to verify the high-voltage setting. This should be about 900 volts.
7. Use of the Ludlum 177 at Humboldt Bay ISFSI will be for performing static analysis of smears and air sample filter papers by holding the probe still and ½” above the smear or filter paper. Should the need arise to frisk something or someone, the maximum frisking speed in 2 inches/second with the probe held ½” above the object or person.
8. The RESET button should be used as required to reset an alarm condition or temporarily re-zero the meter.
9. Upon completion of the survey, return the instrument to its proper storage location, plug it in, and leave it turned on so the battery can charge. Install plastic probe cover if available.

**NOTE**

Pre-use inspections of radiological instruments are only required on the days that the instruments are used and are required at least once each calendar day while in use.

**Pre-Use Checks**

1. Verify that the instrument is in current calibration.
2. Check the instrument for physical damage (broken switches, cracked meter face, etc.).
3. Press and release the BAT TEST button. The meter should indicate within the battery OK limits. If not, connect the instrument to a 120 VAC line to recharge the battery. The ON/OFF switch must be in the ON position for the instrument to charge the battery. Do not use an instrument with a low battery.
4. Perform a source check, as follows:
5. Turn the instrument on and allow 30-second warm-up time prior to performing source check.
  - a. The Ludlum Model 177 is normally left plugged in and turned on to charge the battery, therefore the 30-second warm-up should not be needed.
6. Note the background count rate. This will be subtracted from the measured count rate during the source check.

**NOTE**

The count rates on each source jig are different. Confirm the count rate for each setting on the actual source jig used.

7. The expected response to the Source Jig available at the HB ISFSI is written on labels attached to the Source Jig. Labels should be located on the source jig at the X1, X10, and X100 positions.



Source Stored

X1 Position

8. Position the source in the jig such that the X1 label is showing and the source is below the first position in the jig.
9. Set the function switch on the Ludlum 177 to the X1 position.
10. Position the probe flush on the Source Jig such that the source is centered under the probe.
11. Allow the meter to respond for at least 30 seconds and then note the measured count rate.
12. Subtract the background count rate from the measured count rate (corrected count rate). The results should be within the range posted on the Source Jig. (From the X1 picture above the corrected count rate, also known as Net CPM, should be between 225 and 335 cpm).

13. Repeat Steps 8 through 12 for the X10 and X100 positions. Ensure the X10 and X100 position switches on the Ludlum 177 are chosen for the X10 and X100 positions on the Source Jig respectively. Multiply the measured count rate by 10 when on the X10 scale and by 100 when on the X100 scale.



X10 Position



X100 Position

14. Return the Source Jig to the proper storage location when finished.
15. Any corrected count rates that do not fall within the range listed on the Source Jig are considered UNSAT. The meter shall be removed from service should it fail any pre-use check. Refer to Section 7.2 applicable steps for instructions on removal of instrument from service.
16. Document results of pre-use checks in the appropriate location on Form HBI-201-F-1, "ISFSI Radiological Survey". Refer to Section 7.2 applicable steps for instructions on this documentation.

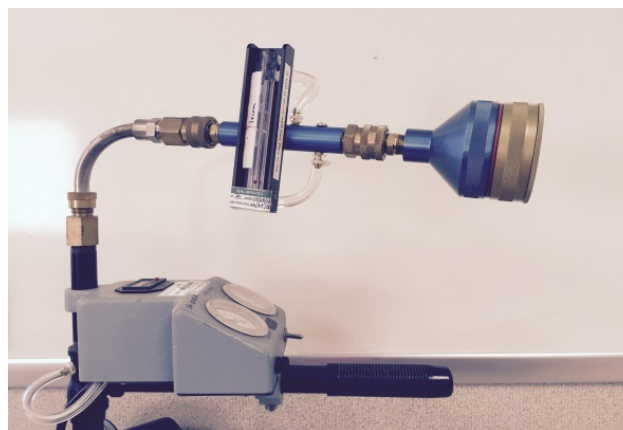
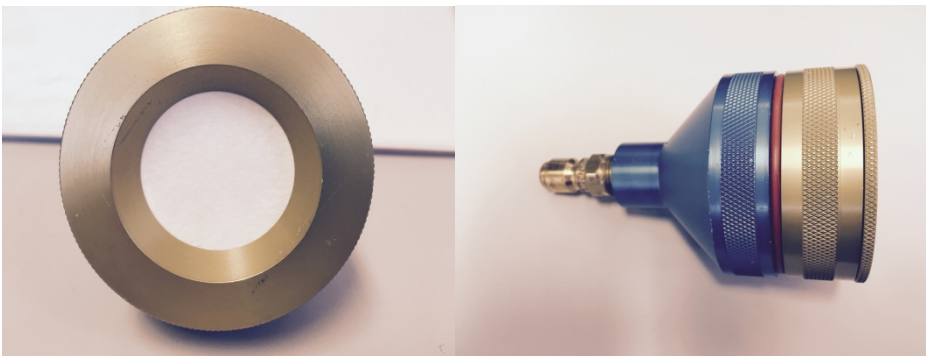
**REFER TO SECTION 7.4 FOR PERFORMING A CONTAMINATION SURVEY  
USING A LUDLUM MODEL 177.**

**Attachment C, Use of the Radeco HD-29A Air Sampler  
(Circle slash method should be used for each step)**

Air sample head and filter paper (below)



Radeco HD-29A (below)



Air sample head installed on Radeco HD-29A (above)



### **Precautions**

1. This unit weighs over 50 pounds. Use good lifting techniques if it must be lifted off the ground.
2. Always turn the air sampler off before changing air sample media head.
3. If used outside or in damp environment, protect the electric components and the air sample head from liquids or excessive moisture. **DO NOT USE** this device in the rain or in standing water!

### **Operation of the Radeco HD-29A**

1. This instrument is a vacuum pump that filters the ambient air at a calibrated flow rate through a filter paper. The amount of radioactivity in the air can then be determined by analyzing the filter paper with an instrument such as a Ludlum 177.
2. An air sample head containing a filter paper would be attached to the instrument flow meter during use. The filter paper is loaded into the sample head with the dull side facing out and the shiny side facing into the sample head and shall contain no gaps around the edge where air could pass through the sample head unfiltered. Ensure O-rings are installed and in good condition in sample head assembly, if applicable. Install sample head onto air sampler flow meter by pulling back on the quick disconnect fitting on the flow meter, inserting sample head, and releasing quick disconnect fitting.
3. This instrument contains an elapsed time meter that can be reset to 0:00 by depressing the RESET button to the right of the elapsed time meter. This is one method of timing the air sample, when running, but it is optional and not required.
4. When used outdoors, care must be taken to ensure the air sampler is placed downwind of the sample point-of-interest. AC power will be required to operate this instrument.
5. This instrument will start drawing ambient air through the filter paper when the on/off toggle switch is placed in the ON position.
6. At HB ISFSI the air samples are run at 2 cfm for 10 minutes providing a sample volume of 20 cubic feet (CF).



**NOTE**

Pre-use inspections of radiological instruments are only required on the days that the instruments are used and are required at least once each calendar day while in use.

**Pre-Use Checks**

1. Verify that the instrument is in current calibration.
2. Check the flow meter and the Radeco HD-29A for physical damage (broken switches, cracked meter face, etc.).

**NOTE**

There are no battery checks or source checks for the Radeco HD-29A.

3. If the instrument fails any pre-use check, place it out of service. Refer to Section 7.2 applicable steps for instructions on removal of instrument from service.
4. Document results of pre-use checks in the appropriate location on Form HBI-201-F-1, "ISFSI Radiological Survey". Refer to Section 7.2 applicable steps for instructions on this documentation.

**REFER TO SECTION 7.5 FOR PERFORMING AN AIRBORNE RADIOACTIVITY SURVEY USING A RADECO HD-29A.**



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Form HBI-201-F-1, ISFSI Radiological Survey

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Location: HB ISFSI Purpose: Emergency Response

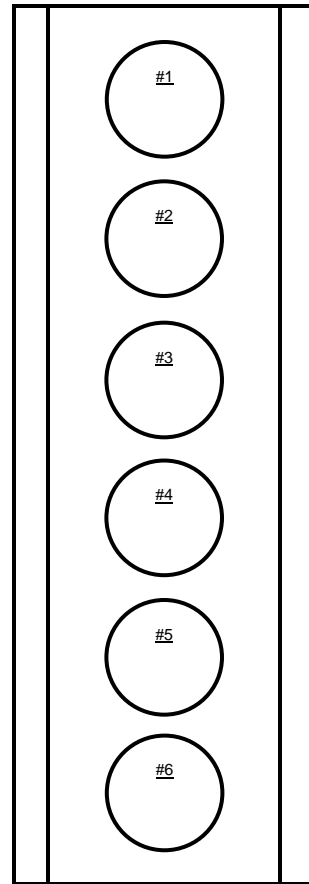
Background count rate (cpm) \_\_\_\_\_

Smear Information (cpm/100 cm<sup>2</sup>)

No.	Beta/ Gamma

ISFSI Building

Posting: Restricted Area  
Radioactive Material I/S Vault



Air Sample Information:

Volume (CF)	
Initial Count (cpm)	
30-min count (cpm)	
60-min count (cpm)	

Dose rates are in micro-R/hr unless otherwise noted.  
 Typical dose rates at ISFSI perimeter are <15 micro-R/hr  
**ALERT Dose Rate Threshold: >300 micro-R/hr.**  
 Contact dose rates: \*dose rate value (ex. \*12).  
 General Area dose rates: Just the dose rate value (ex. 12).  
 Smears: Smear number inside a circle.  
 Air sample: Triangle.

Inst. Model	RP Serial No.	Cal. Due	Pre-Use Check	
			SAT	UNSAT



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Tarps Added  No  Yes to Cask #(s) \_\_\_\_\_

Shielding Added  No  Yes to Cask #(s) \_\_\_\_\_

Comments:

Prepared  
By: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
(Print Name) (Signature) (Date)

Reviewed  
By: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
(Print Name) (Signature) (Date)

Approved  
By: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
(Print Name) (Signature) (Date)



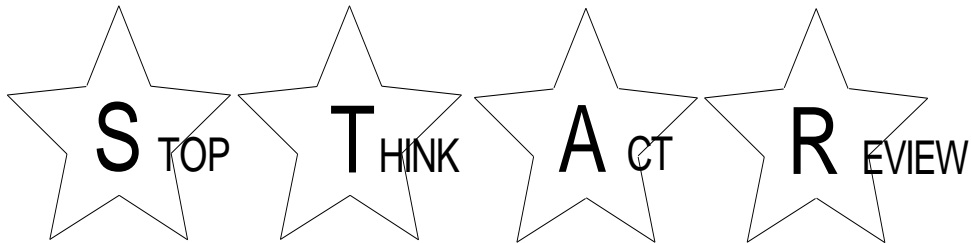
# HBI-261

## EMERGENCY EVENT RESPONSE AND PROTECTIVE ACTIONS

Rev. 8

### QUALITY RELATED

# Humboldt Bay ISFSI



APPROVAL	
Approved By: _____	6/5/2018
ORIGINAL SIGNATURE ON FILE	
(Print / Sign)	Date
Effective Date:	7/25/2018



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**LIST OF ATTACHMENTS**

None

**LIST OF FORMS**

None



## 1.0 PURPOSE

This procedure provides instructions for assessing, classifying, declaring and responding to the emergencies as defined in the Emergency Action Levels and the Humboldt Bay (HB) Emergency Plan (Emergency Plan).

This procedure applies to personnel responsible for supporting the operations and maintenance of the HB Independent Spent Fuel Storage Installation (ISFSI).

## 2.0 DEFINITIONS

- 2.1 Accountability – The process of determining the location of all site personnel.
- 2.2 Active Step - The step is currently being implemented, completed, or worked on.
- 2.3 ALERT - An incident which has led, or could lead to a release to the environment of radioactive or other hazardous material, but the release is not expected to require a response by an offsite response organization to protect persons offsite.
- 2.4 Assembly – The process by which personnel immediately go to a specific assembly area assigned to them to await further instructions.
- 2.5 Emergency Action Level (EAL) - The conditions or types of accidents which define the threshold at which an Alert must be declared are called Emergency Action Levels (EALs). When an off-normal event occurs at the HB Site, the Emergency Coordinator determines whether or not the event is a classifiable emergency.
- 2.6 Emergency Response Facility (ERF) - An area established to function during emergencies to prevent congestion in the Primary Alarm Station (PAS), provide assistance to the Emergency Coordinator by technical personnel, provide coordinated emergency response by both technical and management staff, and provide reliable communications between onsite and offsite emergency response personnel, and provide a focal point for development of recommendations for offsite actions.
- 2.7 Evacuation – The process of removing personnel from an area of potential hazard (e.g. security threat) to a safer location.
- 2.8 Initiating Condition (IC) - One of a predetermined subset of facility conditions, which indicate that the potential exists for a radiological emergency, or that such an emergency has occurred.



### 3.0 REFERENCES AND COMMITMENTS

#### 3.1 References

- 3.1.1 10 CFR 72.32, Emergency Plan
- 3.1.2 HBI-102, “ISFSI Records and Documents”
- 3.1.3 HBI-107, “ISFSI Corrective Action Program”
- 3.1.4 HBI-131, “ISFSI Reporting to the Nuclear Regulatory Commission”
- 3.1.5 HBI-301, “Independent Spent Fuel Storage Installation (ISFSI) Physical Security Plan (PSP)”
- 3.1.6 HBI-500, “ISFSI Vault Closure Lid-Lift and Replacement”

#### 3.2 Commitments

None

### 4.0 RESPONSIBILITIES

- 4.1 Chief Nuclear Officer (CNO) - Responsible for resource acquisition of PG&E business units and assigning a Recovery/Re-Entry Manager to the HB Site, as needed.
- 4.2 Diablo Canyon Power Plant (DCPP) Staff – Responsible for providing technical specialist, familiar with the HB ISFSI, as well as, radiological safety, communications, methodology, and other necessary support functions in an emergency situation.
- 4.3 DCPP Shift Manager - Responsible for assisting the Emergency Coordinator with resource acquisition and communication with appropriate DCPP support organizations.
- 4.4 Director, Nuclear Security and Emergency Services (ISFSI Director) - Responsible for providing resources and management direction for implementing the requirements of this procedure and for authorizing deviations from license conditions or Technical Specifications under the provisions of 10 CFR 72.32(d).
- 4.5 Emergency Advisor (EA) - A member of the PG&E management staff designated as being “on-call” to provide consultation and guidance during an emergency.
- 4.6 Emergency Coordinator – The Emergency Coordinator is qualified and responsible for making an initial evaluation of an incident, performing any immediate actions which are necessary, making required notifications and for placing the appropriate portions of the Emergency Plan into effect.
  - 4.6.1 In the event of an emergency, the ISFSI Shift Manager (ISM) initially assumes the duties of the Emergency Coordinator.



- 4.6.2 The Emergency Coordinator is responsible for directing execution of the required immediate actions under emergency conditions. The required immediate actions include:
- Classification of the emergency,
  - Notification of the site staff,
  - Notification of affected federal, state, and local authorities,
  - Notification of personnel for the augmented ERO (if required),
  - Implementation of required assessment and any site protective measures.
- 4.6.3 The Emergency Coordinator has the authority to realign/reorganize the Emergency Response Organization as deemed appropriate.
- 4.6.4 The Emergency Coordinator may assign other personnel to undertake required assessment and protective actions, as needed.
- 4.6.5 Based on the event, a designated member of the ISFSI staff may be called in to relieve the Emergency Coordinator.
- 4.6.6 The responsibilities of the Emergency Coordinator include:
- a. Direct continuing evaluations of the situation.
  - b. Perform or direct any required supplemental notifications of affected individuals and organizations.
  - c. Assign plant staff personnel to support functions.
  - d. Authorize partial or complete evacuation of the site and specify the appropriate evacuation route.
  - e. Coordinate and direct emergency operations performed by company personnel in the vicinity of the site.
  - f. Perform or direct liaison with local non-company emergency support groups.
  - g. When requested, provide advice to the County Incident Command Center, (ICS) if the ICS is established in response to ongoing security events.
  - h. Obtain Director Nuclear Security & Emergency Services approval prior to authorizing use of company emergency personnel exposure limits.
- 4.7 Emergency Planning Coordinator - Responsible for maintaining the Humboldt Bay Emergency Plan and Implementing Procedures, overseeing exercises and drills, for verifying implementation of the Emergency Plan and facilitating the preparation of required reports.
- 4.8 ISFSI Manager - Responsible for the command and control of ISFSI personnel.
- 4.9 ISFSI Personnel - Responsible for assisting the Emergency Coordinator with implementing the Emergency Plan as directed.



- 4.10 PAS Operator - Responsible for ensuring 911 dispatcher is contacted, informs the Emergency Coordinator of emergency conditions and assumes the role of Emergency Coordinator (if qualified) and acts as Emergency Coordinator if needed.
- 4.11 Recovery and Re-Entry Manager - Appointed by the Chief Nuclear Officer (CNO) to implement recovery and re-entry operations based on the conditions at the HB Site.
- 4.12 Security Coordinator - Responsible for providing security-related support to the Emergency Coordinator and directing activities of Security consistent with the requirements of the HB ISFSI Physical Security Plan.

## 5.0 DISCUSSION

- 5.1 Under some emergency conditions, such as response to security conditions, movement of site personnel to assembly areas or offsite evacuation may interfere with Security and law enforcement response to the event and may create significant risk of exposure to hazardous conditions.
- 5.2 Emergency conditions may involve response to rapidly evolving events including fires, explosions, security condition, adverse radiological conditions and natural phenomena. Caution must be exercised to control employee and public exposure to hazards and to limit the extent of damage to the facility and equipment.
- 5.3 Classification of an emergency event as an Alert must be completed at the time that indications are available to the EC that EALs have been met. For events such as radiological releases, the indication that the EAL has been met is considered to be available when the Emergency Coordinator receives the results of the survey.
- 5.4 **There are no postulated accidents at the HB site which could result in the release of radioactive materials to the environment in quantities that require the implementation of protective actions for the general public.**
- 5.5 15  $\mu\text{R/hr}$  is identified as the ISFSI General Area background. The value is based on the equivalent value of the radiological survey instrument to be used at the ISFSI as compared to the radiological survey instrument used to establish the baseline background levels when the ISFSI was fully loaded.



- 5.6 In the event of a planned ISFSI storage vault closure lid-lift, conducted per HBI-500, “ISFSI Vault Closure Lid-Lift and Replacement,” the on-contact radiation reading on the lid of the spent fuel or GTCC storage overpack is expected to exceed 0.30 mR/hr as an expected condition. If during a planned vault closure lid-lift, an on-contact radiation reading of greater than 19.8 mR/hr on the lid of the spent fuel or GTCC storage overpack is found, the Emergency Coordinator shall be notified as conditions exist to declare an ALERT in HU7, EMERGENCY COORDINATOR JUDGEMENT. An ALERT shall not be declared for damage to a loaded cask CONFINEMENT BOUNDARY (E-HU1) if the on-contact reading of the spent fuel or GTCC overpack is greater than 19.8 mR/hr. In this case, conditions exist to declare an ALERT in HU7, EMERGENCY COORDINATOR JUDGEMENT.
- 5.7 Routine radiological surveys at the ISFSI provide baseline information regarding the expected radiological status. Familiarity with radiological survey equipment used by the ISFSI staff heightens sensitivity to an anomalous condition above or below the initiating condition threshold.
- 5.8 The Emergency Coordinator may take reasonable action that departs from a license condition or a technical specification in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and technical specifications that can provide adequate or equivalent protection is immediately apparent. [Reference 10 CFR 50.54(x), 10 CFR 72.32(d)] Regulations require reporting this departure to the NRC within one (1) hour for Unit 3 Technical Specification departures [Reference 10 CFR 50.72(b)] and within four (4) hours for ISFSI Technical Specification departures involving spent fuel or reactor related GTCC (Reference 10 CFR 72.74). HBI-131, “ISFSI Reporting to the Nuclear Regulatory Commission” provides guidance on reporting.
- 5.9 Place an N/A in any blank for a step that was not required to be performed.

## 6.0 PREREQUISITES

None



## 7.0 INSTRUCTIONS

### NOTE

1. The steps are to be completed by the ISM/Emergency Coordinator, unless otherwise noted.
2. The ISM assumes the duties and responsibilities of an Emergency Coordinator with the initiation of the event assessment.
3. Classification of an emergency event as an Alert must be completed at the time that indications are available to the EC that EALs have been met. For events such as radiological releases, the indication that the EAL has been met is considered to be available when the Emergency Coordinator receives the results of the survey.

### 7.1 ISFSI Storage Vault Closure Lid Actions:

- 7.1.1 In the event of a planned ISFSI storage vault closure lid-lift, conducted per HBI-500, "ISFSI Vault Closure Lid-Lift and Replacement," the on-contact radiation reading on the lid of the spent fuel or GTCC storage overpack is expected to exceed 0.30 mR/hr as an expected condition. If during a planned vault closure lid-lift, an on-contact radiation reading of greater than 19.8 mR/hr on the lid of the spent fuel or GTCC storage overpack is found, the Emergency Coordinator shall be notified as conditions exist to declare an ALERT in HU7, EMERGENCY COORDINATOR JUDGEMENT. An ALERT shall not be declared for damage to a loaded cask CONFINEMENT BOUNDARY (E-HU1) if the on-contact reading of the spent fuel or GTCC overpack is greater than 19.8 mR/hr. In this case, conditions exist to declare an ALERT in HU7, EMERGENCY COORDINATOR JUDGEMENT.

### 7.2 Emergency Classification / Event Declaration

- 7.2.1 Determine if any of the EAL(s) for an ALERT, listed on Table 7.2-1 have been or may be met:

If an ALERT condition has NOT been met, exit this procedure when conditions no longer require an ALERT declaration, or go to Section 7.8, as appropriate.





TABLE 7.2-1

Initiating Conditions	Emergency Action Level For ALERT Classification
<p><b>Damage to a Loaded Cask CONFINEMENT BOUNDARY</b> <b>AA1 (E-HU1)</b></p>	<p>Damage to a loaded cask CONFINEMENT BOUNDARY, as indicated by an on-contact radiation reading greater than 0.30 mrem/hr on the lid of the ISFSI Vault. (NOTE: Contact reading not needed if any reading greater than 0.30 mrem/hr near the vaults is found.)</p>
<p><b>Confirmed SECURITY CONDITION or THREAT</b> <b>HA1 (HU1)</b></p>	<p>A SECURITY CONDITION, described in HBI-341, as reported by Security. <b>OR</b> Notification of a credible security threat directed at the site.</p>
<p><b>Conditions Exist, which in the JUDGMENT of the EMERGENCY COORDINATOR Warrant a Declaration of an Alert.</b> <b>HA7 (HU7)</b></p>	<p>Other conditions exist, which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred, which indicate a potential degradation of the level of safety of the ISFSI or indicate a security threat to ISFSI protection has been initiated.</p>

(Circle slash method should be used for each step)

Initiating Condition: \_\_\_\_\_ EAL: \_\_\_\_\_

7.2.2 Classification of the ALERT declared at: \_\_\_\_\_ / \_\_\_\_\_  
(Date) (Time)

Emergency Coordinator: \_\_\_\_\_ / \_\_\_\_\_  
Printed Name Signature

7.2.3 Notify site personnel of the ALERT with the Emergency Site Siren or alternate means.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials Date Time



7.3 Assembly and Evacuation

7.3.1 Evaluate the necessity of HB Site and Humboldt Bay Generating Station (HBGS) personnel to Shelter-in-Place or Assemble.

Shelter-in-Place

Assemble

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.3.2 Initiate HB Site assembly.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.3.3 Evaluate the necessity to evacuate HB Site and HBGS personnel.

Evacuation of HB Site and HBGS personnel (\_\_\_ is **not**) (\_\_\_ is) necessary.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.3.4 Initiate HB Site (and HBGS) Evacuation.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.4 Notifications

7.4.1 Initiate a Form HBI-131-F-1, HB ISFSI Safeguards Event Report and maintain during notification response.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time



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7.4.2 Within one hour of declaring an ALERT in step 7.2.2, complete the required notifications by calling:

- Humboldt County Sheriff's Office (HCSO) and request HCSO notify the Humboldt County Office of Emergency Services.
- State Office of Emergency Services Warning Center

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.4.3 Within one hour of declaring the ALERT in step 7.2.2, and immediately after notifications of step 7.4.2, notify the Nuclear Regulatory Commission (NRC) and document on Form HBI-131-F-1, HB ISFSI Safeguards Event Report.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.4.4 Notify the appropriate PG&E management staff of the ALERT:

- Emergency Advisor (EA)
- ISFSI Manager
- ISFSI Director
- HB Director
- HBGS Control Room, if not previously informed.
- PG&E Public Information Office

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.4.5 Refer to HBI-131, "ISFSI Reporting to the Nuclear Regulatory Commission" for additional NRC reporting requirements during site Emergency Plan Events.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time



7.5 ERO Activation

7.5.1 Identify and mobilize to the desired Emergency Response Facility (ERF) for assembly of Emergency Response Organization personnel.

- a. ISFSI Operations Office Conference Room (Primary location)
- b. ISFSI Building (Alternate location)
- c. Office Annex Conference Room (Alternate location)
- d. Offsite Emergency Response Center (Myrtle Avenue Service Center)

ERF Location Selected: \_\_\_\_\_

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.5.2 Notify Emergency Response Personnel reporting to ERF of:

- What is the emergency classification
- What time was the emergency classified
- Who is the Emergency Coordinator
- What is the current status of the Emergency

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.5.3 Identify and confirm additional technical management support is available for telecommunication within 2 hours.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.6 Mitigation and Subsequent Actions

7.6.1 Request offsite assistance from PG&E and non-company resources as needed to mitigate the effects of the emergency.

7.6.2 If EAL was associated with Damage to a Loaded Cask Confinement Boundary,

- a. Contact the DCPD Operations Shift Manager at (805) 545-3377 or PG&E line 691-3377 and provide the following information:
  - 1) Name of caller
  - 2) Title of caller



- 3) Reason for call: "Urgent radiological occurrence at the Humboldt Bay ISFSI."
  - 4) Expected Shift Manager Action: Contact the DCPD RPM or On-call RP Supervisor with pertinent information.
  - 5) Current radiological conditions at HB ISFSI:
  - 6) Historical background radiation level is: 15  $\mu$ R/hr
  - 7) Current radiation level at the Restricted Area boundary is: \_\_\_\_\_
  - 8) Current radiation level in occupied area (PAS) is: \_\_\_\_\_
  - 9) Describe any signs of physical damage to the ISFSI vault.
  - 10) Identify any potential personnel contamination issues.
  - 11) Contact phone number.
- b. Implement mitigation strategies as directed by DCPD RPM or On-call RP Supervisor which may include: the placement of covering and shielding materials (typically plastic sheeting and lead blankets) over suspected location(s) of confinement boundary damage and decontamination of personnel.
- 7.6.3 If EAL was associated with Confirmed Security Condition or Threat, refer to ISFSI Security Procedures.
- 7.6.4 If EAL was associated with Judgement of the Emergency Coordinator to Warrant a Declaration of an Event, the Emergency Coordinator and ERO shall determine the safest and most prudent path forward.
- 7.7 Monitoring
- 7.7.1 Immediately report to the NRC per HBI-131, "ISFSI Reporting to the Nuclear Regulatory Commission":
- a. Any further degradation in a level of safety of the ISFSI or other worsening conditions or a termination of the Emergency Class.
  - b. The results of ensuring evaluations and assessments of the ISFSI conditions.
  - c. The effectiveness of response or protective measures taken.
  - d. Information related to ISFSI behavior that is not understood.
- 7.7.2 Maintain an open, continuous communication channel with the NRC Headquarters Operations Center, upon request by the NRC.
- 7.7.3 Consider need to update emergency classification.
- 7.7.4 Consider need for initiation of or changes to onsite protective actions.
- 7.7.5 Consider effects of security condition, toxic gas hazards and natural phenomena.
- 7.7.6 Consider need to evacuate HB Site and HBGS personnel, if conditions change.
- 7.7.7 Proceed to Section 7.8 when conditions no longer require Emergency Response Organization.



7.7.8 Initiate a CAP issue in accordance with HBI-107, "ISFSI Corrective Action Program" to document the event, preparation of a Post Event Report, and identify additional agency reporting required in accordance with HBI-131, "ISFSI Reporting to the Nuclear Regulatory Commission."

7.8 Classification (Event) Termination

NOTE  
Sections 7.8 and 7.9 may be performed concurrently

7.8.1 Consider the following conditions. If any of the conditions have not improved or are expected to deteriorate, return to Section 7.7.

- Stability of ISFSI conditions.
- Level of control of ISFSI operations.
- Likelihood of further improvement in ISFSI conditions.
- Radioactive material boundary integrity.
- Elimination of hazardous or natural phenomena.

7.8.2 Ensure criteria for emergency classification no longer exist by reviewing ISFSI conditions and EALs provided on Table 7.2-1.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.8.3 Terminate the emergency classification.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time



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7.8.4 Immediately notify NRC, then notify state and local agencies of event termination:

- NRC
- State Office of Emergency Services Warning Center
- Humboldt County Sheriff's Office to notify Humboldt County Office of Emergency Services.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.8.5 Inform ERO of termination of emergency classification.

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.8.6 Notify the appropriate PG&E management staff of event termination:

- Emergency Advisor (EA)
- ISFSI Manager
- ISFSI Director
- HB Director
- HBGS Control Room, if not previously informed.
- PG&E Public Information Office

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Initials      Date      Time

7.9 Re-entry and Recovery

7.9.1 The ISFSI Director shall coordinate with the CNO for the assignment of a Recovery and Reentry Manager, if required.

7.9.2 The Emergency Coordinator (or Recovery and Reentry Manager, if assigned) shall coordinate with ERO to establish a recovery plan that will include;

- a. An orderly evaluation of the cause and effects of the emergency.
- b. Identification of measures necessary to restore the HB Site to pre-emergency conditions.
- c. Identification of additional assistance from off-site organizations.



- d. Re-entry guidance of DCPD RPM.
  - e. Re-entry strategy that is a planned and deliberate entry to the HB Site evacuated area that minimizes personnel radiation exposure or exposure to other potential hazards.
- 7.9.3 ISFSI Director shall be appraised of re-entry plans.
- 7.9.4 Emergency Coordinator shall approve all initial re-entries into evacuated area, if still in ALERT status.
- 7.9.5 ISFSI Director shall approve re-entries if not in an ALERT status.
- 7.9.6 When event is declassified, restore ERF, equipment, and supplies to a state of readiness.
- 7.10 Event Response Critique
- 7.10.1 To meet the requirement in 72.75(g) to submit a written follow-up report to the NRC within 60 days, the Emergency Planning Coordinator shall convene a meeting of personnel involved with the response to the event to discuss and consolidate:
- a. Details and notes of the event initiation and response.
  - b. Corrective actions taken or planned to prevent recurrence of the event.
  - c. Any program changes resulting from a critique of emergency response activities.
- 7.10.2 The Emergency Planning Coordinator shall prepare a Post Event Critique.
- 7.11 Post Event Report
- 7.11.1 The Emergency Planning Coordinator shall develop a Post Event Report to include the following areas, as applicable:
- a. Cause of event.
  - b. Personnel and equipment involved.
  - c. Extent of injury and damage as a result of the event.
  - d. Onsite and Offsite assistance requested and received.
  - e. Locations of contamination with final contamination survey results.
  - f. Mitigating actions taken to terminate the emergency.
  - g. Corrective actions taken or planned to prevent recurrence of the event.





h. Any program changes resulting from a critique of emergency response activities.

7.11.2 The ISFSI Manager shall review and approve the Post Event Report.

7.11.3 The Emergency Planning Coordinator shall transmit Post Event Report to Regulatory Services for processing to the NRC in accordance with 10 CFR 72.75(g).

## 8.0 RECORDS

The following records are generated as a result of performance of this procedure and shall be retained in accordance with HBI-102, "ISFSI Records and Documents":

DOCUMENT	RESPONSIBILITY
Completed Procedure HBI-261	ISFSI Manager
Approved Post Event Report including Critique	ISFSI Manager

## 9.0 ATTACHMENTS

None

## 10.0 FORMS

None

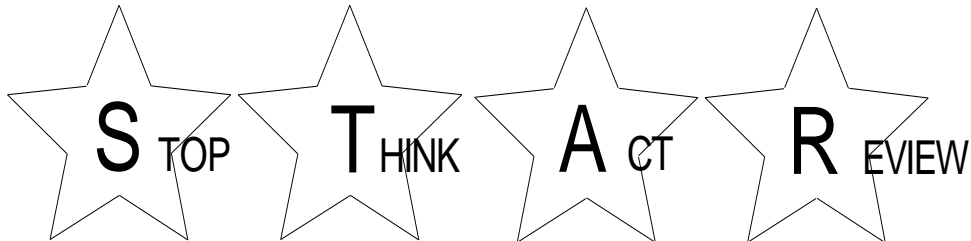
# HBI-262

## ISFSI RESPONSE AND ACTIONS

Rev. 6

### QUALITY RELATED

# Humboldt Bay ISFSI



APPROVAL	
Approved By: _____	1/19/2018
ORIGINAL SIGNATURE ON FILE	Date
(Print / Sign)	
Effective Date:	2/14/2018



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**LIST OF ATTACHMENTS**

- Attachment A, “Medical Emergency”
- Attachment B, “Fire / Explosion”
- Attachment C, “Significant Earthquake”
- Attachment D, “Tsunami”

**LIST OF FORMS**

None

## 1.0 PURPOSE

This procedure is one of the Emergency Plan Implementing Procedures to provide instruction for responding to events which are not expected to require the declaration of an Alert at the Humboldt Bay (HB) Site. The events addressed are:

- a. Medical Emergencies
- b. Fire / Explosion
- c. Significant Earthquake
- d. Tsunami

This procedure applies to personnel responsible for supporting the operations and maintenance of the HB Independent Spent Fuel Storage Installation (ISFSI).

## 2.0 DEFINITIONS

- 2.1 Accountability - The process of determining the location of all individuals remaining within a Restricted Area.
- 2.2 Assembly - The process by which personnel immediately go to a specific assembly area assigned to them to await further instructions.
- 2.3 Evacuation - The process of removing personnel from an area of potential hazard to a safer location.
- 2.4 Humboldt Bay Power Plant (HBPP) Site - The property includes a single, non-operational nuclear unit (Unit 3) undergoing decontamination and decommissioning (D&D) activities and the HB Independent Spent Fuel Storage Installation (ISFSI). The HBGS co-located on the PG&E property is not included in the HB Site.
- 2.5 Independent Spent Fuel Storage Installation Facility (ISFSI) -The HB ISFSI and associated infrastructure.
- 2.6 Medical Emergency - An injury, illness, or radiation overexposure which cannot be treated with normal first aid techniques, or the individual is not conscience or mobile, or has come in electrical contact, or has been injured by an electrical flash.
- 2.7 Security Boundary Fence - The fence that restricts access to the area surrounding the ISFSI building and the Security Area.
- 2.8 Significant Earthquake - An earthquake which creates visible movement on site (e.g., books and office materials fall from shelves) and may cause personnel to hold onto something to keep from losing balance.

### 3.0 REFERENCES AND COMMITMENTS

#### 3.1 References

- 3.1.1 HBI-102, "ISFSI Records and Documents"
- 3.1.2 HBI-107, "ISFSI Corrective Action Program"
- 3.1.3 HBI-131, "ISFSI Reporting to the Nuclear Regulatory Commission"
- 3.1.4 HBI-261, "Emergency Event Response and Protective Actions"
- 3.1.5 HBI-350, "ISFSI Security Test and Inspection Program"
- 3.1.6 HBI-450, "ISFSI Inspections and Monitoring"
- 3.1.7 EM PLN: HBI-L4, "Humboldt Bay Emergency Plan"
- 3.1.8 40 CFR 355, Appendix A, "The List of Extremely Hazardous Substances and Their Threshold Planning Quantities"

#### 3.2 Commitments

There are no commitments implemented by this procedure.

### 4.0 RESPONSIBILITIES

- 4.1 Director, Nuclear Security and Emergency Services (ISFSI Director) - Responsible for interfacing with Nuclear Generation departments and other PG&E business units for resources to support HB ISFSI operations and maintenance (e.g. this could be accomplished by the use of conference call if needed).
- 4.2 Emergency Coordinator - The Emergency Coordinator is qualified and responsible for making an initial evaluation of an incident, performing any immediate actions which are necessary, making required notifications and for placing the appropriate portions of the Emergency Plan into effect.
  - 4.2.1 In the event of an emergency, the ISFSI Shift Manager (ISM) initially assumes the duties of the Emergency Coordinator.
  - 4.2.2 The Emergency Coordinator has the authority to realign/reorganize the Emergency Response Organization as deemed appropriate.
  - 4.2.3 The Emergency Coordinator may assign other personnel to undertake required assessment and protective actions, as needed.
  - 4.2.4 Based on the event, a designated member of the ISFSI staff may be called in to relieve the Emergency Coordinator.
  - 4.2.5 The responsibilities of the Emergency Coordinator include:
    - a. Direct continuing evaluations of the situation.
    - b. Perform or direct any required supplemental notifications of affected individuals and organizations.



- c. Assign plant staff personnel to support functions.
  - d. Authorize partial or complete evacuation of the site and specify the appropriate evacuation route.
  - e. Coordinate and direct emergency operations performed by company personnel in the vicinity of the site.
  - f. Perform or direct liaison with local non-company emergency support groups.
  - g. When requested, provide advice to the County Incident Command Center (ICS), if the ICS is established in response to ongoing security events.
  - h. Obtain ISFSI Director approval prior to authorizing use of company emergency personnel exposure limits.
- 4.3 HB Site Personnel (Site Personnel) - Responsible for assisting the ISM with the implementation of this procedure, as requested. (These individuals do not perform Emergency Plan activities requiring additional qualifications.)
- 4.4 ISFSI Manager - Responsible for the command and control of ISFSI personnel.
- 4.5 ISFSI Personnel - Responsible for assisting the ISM with the implementation of this procedure.
- 4.6 ISFSI Shift Manager (ISM) - Responsible for the implementation and coordination of activities within this procedure with the support of other assigned site and ISFSI personnel.
- 4.7 Local Services Support - Responsible for assisting HB ISFSI personnel by providing law enforcement, medical, hospital, ambulance and firefighting support on a 24 hours-per-day, on-call response basis.
- 4.8 PG&E Environmental Field Representative - Representative of the PG&E Environmental Department, responsible for providing advice and direction related to response, mitigation and cleanup of hazardous material spills.
- 4.9 PG&E Safety, Health and Claims Department - Responsible for the development and issuance of company reports related to serious injuries or illnesses per their procedures and processes.
- 4.10 Primary Alarm Station (PAS) Operator - Responsible for ensuring the 911 dispatcher is contacted and for informing the ISM of abnormal conditions.

## 5.0 DISCUSSION

- 5.1 Under some abnormal conditions, movement of site personnel to assembly areas or offsite evacuation may interfere with response to the event and may create significant risk of exposure to hazardous conditions.
- 5.2 Adverse onsite conditions may create hazards for personnel on site and for offsite support personnel reporting to the site.
- 5.3 An abnormal event may involve multiple simultaneous or sequential events.



- 5.4 There are no postulated accidents for the HB Site that could result in the release of radioactive materials to the environment in quantities that require the implementation of protective actions for the general public.
- 5.5 The HB ISFSI does not have extremely hazardous substances present in amounts equal to or greater than the threshold quantities of 40 CFR 355, Appendix A, “The List of Extremely Hazardous Substances and Their Threshold Planning Quantities”.
- 5.6 Because limited quantities of hazardous materials are stored and used at the ISFSI and HBPP Unit 3, spills or other accidents involving hazardous materials do not have the potential for posing a threat to onsite or offsite personnel.
- 5.7 Notification of a tsunami can come from agencies set up for monitoring conditions of an earthquake and/or tsunami. These include:
- a. (California) State Warning Center
  - b. PG&E Geosciences Center
  - c. National Weather Service
  - d. Alaska or Pacific Tsunami Warning Center

## 6.0 PREREQUISITES

None



**7.0 INSTRUCTIONS**

7.1 Identify the event condition and go to the appropriate response:

<b>TABLE 7.1</b>	
<b>EVENT CONDITIONS</b>	<b>RESPONSE</b>
A condition that meets the definition of a medical emergency, as detected by HB site personnel  -or- Receive notification of a medical emergency	Attachment A, "Medical Emergency"
A fire or explosion is realized by personal observation or by notification that the fire cannot be extinguished by onsite personnel	Attachment B, "Fire / Explosion"
A significant earthquake felt in the Primary Alarm Station (PAS)	Attachment C, "Significant Earthquake"
Notification of an imminent tsunami  -or- Activation of the County Coastal Tsunami Warning Siren	Attachment D, "Tsunami"
Damage to a Loaded Cask Confinement Boundary	Refer to HBI-261 and exit this procedure
Security condition, described in HBI-341  -or- notification of a credible security threat at the site	
ISM judgment requiring activation of the Emergency Response Organization	

7.2 If conditions change, return to Section 7.1.

7.3 Initiate a CAP issue in accordance with HBI-107, "ISFSI Correction Action Program", to document the event, identify agencies required to be notified, and to identify any recovery actions needed.





**8.0 RECORDS**

Records generated will be controlled via the respective procedure in which they were generated and retained in accordance with HBI-102, “ISFSI Records and Documents”.

DOCUMENT	RESPONSIBILITY
None	None

**9.0 ATTACHMENTS**

- Attachment A, “Medical Emergency”
- Attachment B, “Fire / Explosion”
- Attachment C, “Significant Earthquake”
- Attachment D, “Tsunami”

**10.0 FORMS**

None



**Attachment A, Medical Emergency**  
**(Circle slash method should be used for each step)**

**1.0 IMMEDIATE ACTIONS**

1.1 PAS Operator:

1.1.1 COLLECT the following information:

- a. Time call received: \_\_\_\_\_
- b. Location of Injured/Ill Person: \_\_\_\_\_
- c. Name of person reporting the injury: \_\_\_\_\_
- d. Telephone number of reporting party: \_\_\_\_\_
- e. Name of injured/ill person(s) \_\_\_\_\_
- f. Nature of injury/illness (chest pains, broken bones, etc.):  
\_\_\_\_\_
- g. Identified need for offsite emergency services required:  
\_\_\_\_\_
- h. Radiological contamination status of injured/ill person(s).  
\_\_\_\_\_

1.1.2 DETERMINE if personnel on the scene are trained to administer first aid.

1.1.3 If required, CONTACT 911 dispatcher for medical assistance and DIRECT offsite emergency personnel to the appropriate gate.

1.1.4 NOTIFY ISM.

1.2 ISM/Emergency Coordinator:

1.2.1 ASSUME role as Emergency Coordinator.

1.2.2 ENSURE 911 dispatcher was contacted for medical assistance, if required.

1.2.3 DISPATCH additional HB site personnel to assist with patient care or decontamination, as needed.

1.2.4 ASSIGN an individual to meet offsite emergency services at appropriate gate to direct offsite personnel to the onsite medical emergency.



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1.2.5 NOTIFY hospital of patient transport, as needed.

### 2.0 SUBSEQUENT ACTIONS

- 2.1 NOTIFY the ISFSI Manager of the event.
- 2.2 NOTIFY the ISFSI Director of the event.
- 2.3 NOTIFY the Humboldt Bay Generating Station (HBGS) Control Room of the event.
- 2.4 DIRECT a qualified monitor with appropriate portable survey instrument to accompany the injured individual to hospital, if potentially radioactively contaminated.
- 2.5 CONTACT 24/7 PG&E Injury Reporting for PG&E employees to report the injury.
- 2.6 If a serious injury, CONTACT PG&E Safety Health and Claims Department.
- 2.7 RETURN to HBI-262 procedure Section 7.2, if conditions change.

#### NOTE

Recovery Actions are guidelines for follow-up activities implemented and directed by the ISM after the Emergency Coordinator secures from the event response.

### 3.0 RECOVERY ACTIONS

- 3.1 DIRECT cleanup of biohazards, utilizing the Blood Borne Pathogen Kit.
- 3.2 ENSURE the injury and/or illness is reported to employee's supervisor and employer.
- 3.3 ASSIST PG&E Safety Health and Claims Department with investigation and company reports, as required.
- 3.4 REFER to HBI-131, "ISFSI Reporting to the Nuclear Regulatory Commission", if the event resulted in the transportation of a radioactively contaminated individual to the hospital or a press release.



**Attachment B, Fire / Explosion**  
**(Circle slash method should be used for each step)**

**1.0 IMMEDIATE ACTIONS**

1.1 PAS Operator:

1.1.1 COLLECT the following information:

- a. Time call received: \_\_\_\_\_
- b. Location of Fire/Explosion: \_\_\_\_\_
- c. Name of reporting party: \_\_\_\_\_
- b. Telephone number of reporting party: \_\_\_\_\_

1.1.2 DETERMINE if personnel on the scene can safely implement firefighting efforts to the extent of their training.

1.1.3 CONTACT 911 dispatcher, request assistance from offsite fire response agencies and DIRECT offsite emergency personnel to the appropriate gate.

1.1.4 DESIGNATE an individual to activate the site emergency fire tone, if necessary.

1.1.5 NOTIFY ISM.

1.2 ISM/Emergency Coordinator:

1.2.1 ASSUME role as Emergency Coordinator.

1.2.2 ENSURE appropriate immediate actions were taken:

- a. 911 dispatcher was notified.
- b. Site emergency fire tone was activated, if necessary.
- c. Assistance was requested from offsite fire response agencies.

1.2.3 DISPATCH assigned responders with a radio to site gate to direct arriving fire personnel to fire scene and provide the radio to the fire department personnel.

1.2.4 DISPATCH knowledgeable personnel to the scene of the fire to:

- a. Secure ventilation in the area, as required.
- b. De-energize affected equipment, as required.



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### 2.0 SUBSEQUENT ACTIONS

- 2.1 NOTIFY the ISFSI Manager of the event.
- 2.2 NOTIFY the ISFSI Director of the event.
- 2.3 NOTIFY the Humboldt Bay Generating Station (HBGS) Control Room of the event.

#### NOTE

ISFSI facility checks are performed at the discretion of the Emergency Coordinator, based on the location of the fire.

- 2.4 Direct the performance of ISFSI facility checks, if necessary:
  - 2.4.1 CONFIRM that computer terminal displays normal access report.
  - 2.4.2 CONDUCT weekly test in accordance with HBI-350, "ISFSI Security Test and Inspection Program."
  - 2.4.3 PERFORM a visual inspection of the external (accessible and visible) surfaces of the ISFSI vault and vault lids for evidence of damage.
- 2.5 RETURN to HBI-262 procedure Section 7.2, if conditions change.



**Attachment C, Significant Earthquake**  
**(Circle slash method should be used for each step)**

**1.0 IMMEDIATE ACTIONS**

- 1.1 PAS Operator
  - 1.1.1 NOTIFY ISM
- 1.2 ISM/Emergency Coordinator:
  - 1.2.1 ASSUME role as Emergency Coordinator.

**2.0 SUBSEQUENT ACTIONS**

- 2.1 NOTIFY ISFSI Manager of the event.
- 2.2 NOTIFY ISFSI Director of the event.
- 2.3 NOTIFY Humboldt Bay Generating Station (HBGS) Control Room of the event.
- 2.4 EVALUATE availability of communications (e.g., phone, cell, internet, satellite phone, VHF radio).
- 2.5 OBTAIN information regarding a possible tsunami from one of the following, if possible:
  - 2.5.1 (California) State Warning Center
  - 2.5.2 PG&E Geosciences Center website
  - 2.5.3 USGS website, <http://earthquake.usgs.gov/earthquakes>
  - 2.5.4 West Coast and Alaska Tsunami Warning Center website, <http://wcatwc.arh.noaa.gov/index.php>
  - 2.5.5 National Weather Service Office, Eureka, CA
- 2.6 If a tsunami is anticipated, PROCEED to Attachment D: "Tsunami". N/A if no tsunami is expected.
- 2.7 PERFORM ISFSI facility checks when safe to do so, as follows:
  - 2.7.1 CONFIRM that computer terminal displays normal access report.
  - 2.7.2 CONDUCT weekly HBI-350, "ISFSI Security Test and Inspection Program" test.
  - 2.7.3 ENSURE PAS Operator received appropriate alarms during the event and entries, as applicable.



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- 2.7.4 PERFORM Vault Drainage System Surveillance Section of HBI-450, “ISFSI Inspections and Monitoring.”
- 2.7.5 PERFORM a visual examination of the external (accessible and visible) surfaces of the vault and vault lid and inform the Emergency Coordinator of the results.
- 2.8 RETURN to HBI-262 procedure Section 7.2, if conditions change.

### NOTE

Recovery Actions are guidelines for follow-up activities implemented and directed by the ISM after the Emergency Coordinator secures from the event response.

### 3.0 RECOVERY ACTIONS

- 3.1 ASSESS damage to structures on the HB site.
- 3.2 COORDINATE debris cleanup and re-establishment of access, as required.



**Attachment D, Tsunami**  
**(Circle slash method should be used for each step)**

**1.0 IMMEDIATE ACTIONS**

1.1 PAS Operator:

1.1.1 NOTIFY ISM

1.2 ISM/Emergency Coordinator:

1.2.1 ASSUME role as Emergency Coordinator.

1.2.2 NOTIFY site personnel using as many of the following as are available:

a. Site emergency siren tsunami tone, if necessary.

b. A radio broadcast, as appropriate, over the site radio system.

1.2.3 ASSIGN ISFSI personnel to open access gates to the ISFSI Security Boundary Fence and direct people to assemble on high ground at the ISFSI.

**2.0 SUBSEQUENT ACTIONS**

2.1 Notify ISFSI Manager of the event.

2.2 NOTIFY ISFSI Director of the event.

2.3 NOTIFY Humboldt Bay Generating Station (HBGS) Control Room of the event.

2.4 IDENTIFY individual(s) who may require search and rescue efforts.

2.5 INITIATE search and rescue effort as soon as safe to do so.

2.6 EVALUATE availability of communications (e.g., phone, cell, internet, satellite phone, VHF radio).

2.7 OBTAIN information regarding the tsunami from one of the following, if possible:

2.7.1 (California) State Warning Center

2.7.2 PG&E Geosciences Center website,  
[http://gisweb/GIS/map\\_frames.asp?map=geosci\\_1](http://gisweb/GIS/map_frames.asp?map=geosci_1)

2.7.3 USGS website, <http://earthquake.usgs.gov/earthquakes>

2.7.4 West Coast and Alaska Tsunami Warning Center website,  
<http://wcatwc.arh.noaa.gov/index.php>





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- 2.7.5 National Weather Service Office, Eureka, CA
- 2.8 After the tsunami threat has passed and there is no longer any danger to personnel:
  - 2.8.1 ESTABLISH protective actions for individuals in the assembly area.
  - 2.8.2 MITIGATE the consequences of any damage with available resources.
  - 2.8.3 NOTIFY personnel via local announcement of information as it becomes available.
  - 2.8.4 RELEASE personnel from the assembly area when safe to do so.
  - 2.8.5 SECURE the area within the Security Boundary Fence.
- 2.9 PERFORM ISFSI facility checks when safe to do so, as follows:
  - 2.9.1 CONFIRM that computer terminal displays normal access report.
  - 2.9.2 CONDUCT weekly HBI-350, “ISFSI Security Test and Inspection Program” test.
  - 2.9.3 ENSURE PAS Operator received appropriate alarms during the event and entries, as applicable.
  - 2.9.4 PERFORM Vault Drainage System Surveillance Section of HBI-450, “ISFSI Inspections and Monitoring.”
  - 2.9.5 PERFORM a visual examination of the external (accessible and visible) surfaces of the vault and vault lid and inform the Emergency Coordinator of the results.
- 2.10 RETURN to HBI-262 procedure Section 7.2, if conditions change.

### NOTE

Recovery Actions are guidelines for follow-up activities implemented and directed by the ISM after the Emergency Coordinator secures from the event response.

### 3.0 RECOVERY ACTIONS

- 3.1 ASSESS damage to structures on the HB site.
- 3.2 COORDINATE debris cleanup and re-establishment of access, as required.