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Distribution Date: 03/09/20

Filed By: _____

Prepared by: LB

Procedure Number	Revision
13.8.1	039/004

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Updated 02/12/2020

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PLANT PROCEDURES MANUAL	PCN#: N/A
 13.8.1	Effective Date: 03/09/20

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DESCRIPTION OF CHANGES

Justification (required for major revision)
Revision 39: Added Attachment 7.8, Detailed URI

Page(s)	Description (including summary, reason, initiating document, if applicable)
11	Added statement to refer to Attachment 7.8, Detailed URI Deleted steps in Section 4.3 that are now contained in Attachment 7.8
13	Added Attachment 7.8, Detailed URI, to list of Attachments.
16,19, 23	Revised NOTE to indicate that the MET tower would be OOS during a loss of SM-8 and that met information from FFTF should be used instead.
27	Added NOTE describing idiosyncrasies of the sample rack.
31, 32	Added Attachment 7.8, Detailed URI
23	Minor Rev 001: Name change from PNNL to Mission Service Alliance (MSA)
4	Minor Rev 002: Added "{R-5.1.1}" to the end of the first paragraph in Section 1.o Purpose.
5	Minor Rev 002: Added definition for REACTOR CORE ACCIDENT to Definitions section.
12	Minor Rev 002: Section 5.1, renumbered "10 CFR 50 .47(b) Planning Standard" to 5.1.2 and Replaced "10 CFR 50, Appendix E, Emergency Plan" with "EP-01, Emergency Plan" as number 5.1.1.
15	Minor Rev 003: Step 2.1.1.d, Updated date of shutdown for refueling
18	Minor Rev 003: Step 3.1.3.b, Updated date of shutdown for refueling
31	Minor Rev 003: Step 4, Updated date of shutdown for refueling
3	Minor Rev 004 Updated page numbers for Table of Contents

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1.0 PURPOSE

This procedure provides instructions for the use of the computerized dose projection system Unified RASCAL Interface (URI) to predict offsite dose rates, integrated doses and radioactive material deposition for locations within the 10-mile Plume Emergency Planning Zone (EPZ) and the 50-mile Ingestion EPZ. Actual manipulation of system display terminals is described in document MAN-URI-01 referred to as the URI User's Manual. {R-5.1.1}

The dose projection system is used for estimating the whole body (TEDE) and thyroid (CDE) doses of onsite and offsite persons in the event of potential or actual accidental release of radioactivity to the environment. The dose projection system used at Columbia consists of a computer software program that relies on pre-calculated, real time, site-specific relationships between effluent monitor readings (or sample results) and on-site and offsite dose rates.

The dose projection system is available in the Control Room, TSC, EOF, and Alternate EOF. Having the dose projection system software loaded on multiple, stand-alone computers located in the various emergency centers maximizes dose projection capability. Field Team data may be used to calculate dose projections or validate previous projections.

The software program supports a rapid version of dose projection using limited pathways for a rapid evaluation of the release out to 10 miles. The software also supports a detailed dose projection based on more detailed pathways with dose projections from the site boundary out to 10 or 50 miles.

State and county organizations will have access to this system in the EOF or by transmission of output information to their emergency centers.

2.0 DEFINITIONS

2.1 CDE Thyroid – Committed Dose Equivalent to the thyroid.

2.2 Delta T - The temperature difference between two sensors located at different elevations on a meteorological tower.

2.3 EDE to TEDE Ratio (EDE/TEDE) – Ratios computed by URI that are used for determining the Emergency Worker Dose Adjustment Factor. The EDE is the external gamma dose that is normally monitored by emergency workers through their self-reading dosimeters (electronic dosimeters or pocket ion chambers); and TEDE is the total dose from both EDE and the internal dose from inhaled iodines and particulates.

2.4 Elevated Release – An effluent release point model that assumes that the release point is from a discreet true elevated (tall) stack.

2.5 Emergency Worker Dose Adjustment Factor (EWDAF) - An adjustment factor determined from the EDE/TEDE Ratio that is used by offsite emergency workers to monitor their TEDE whole body dose based on their EDE doses as measured on their self-reading dosimeters. The adjustment factor is the inverse of the EDE/TEDE Ratio reported by URI (for example, an EDE/TEDE Ratio of 0.15 would mean that the EWDAF is $1 / 0.15 = 6.7$).

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2.6 Radioactive Release - A radioactive release is in progress when:

Effluent monitors indicate an increase in radiation levels from normal readings for plant operating conditions,

Or

Field teams detect environmental radiation 10 times greater than normal background.

AND

The increased levels are attributable to the emergency event.

2.7 Radioactive Release Termination - A radioactive release is terminated when the following criteria have been met:

1. The source of the release has been isolated;
2. The effluent monitors are trending downward (if available);
3. Environmental Field Team surveys indicate a decrease in radiation levels or airborne radioactivity.

2.8 RASCAL - NRC supported and distributed computer software for determining source term, atmospheric dispersion, and dose consequences.

2.9 REACTOR CORE ACCIDENT - This indicates core damage GE 0.1% as identified by process rad monitors indicating GE Table 3 (13.1.1) Alert values.

2.10 Site Boundary (SB) - Closest distance between owner controlled area boundary and core, set at 1.2 miles.

2.11 Source Term - The quantity and radionuclide makeup of the material in the release. The source term used in URI is based on NUREG-1228.

2.12 Stability Class - Values from A to G representing ranges of Delta T which in turn represent atmospheric mixing estimations. The NRC definitions of these ranges are used to define the stability classes used in URI.

2.13 Stack Door Monitor (SDM) - A portable radiation survey meter (e.g., Teletector) or radiation monitoring instrument (e.g., AMP-100) used for monitoring radiation levels at the exterior and center of the Elevated Release Stack Access Door (R-DOOR-R515). This provides an alternate means for monitoring Reactor Building post-accident effluent releases when the installed Process Radiation Monitor (PRM) Stack Monitor is inoperable or unavailable. SDM readings (in mR/hr) are available from HP; or, when set up for remote monitoring, through eDNA Real-Time Client or eDNA Trend from eDNA Point IDs EP99M (mid-range SDM) and EP99H (high-range SDM) in the ENW.WRM Service.

2.14 TEDE - Total Effective Dose Equivalent (TEDE) - The sum of the Deep Dose Equivalent (DDE) and the Committed Effective Dose Equivalent (CEDE).

2.15 Unified RASCAL Interface (URI) - Computer software which replaces the NRC issued RASCAL user interface for user input of dose assessment parameters and interpretation of results that interfaces to the RASCAL meteorological and dose processor modules.

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3.0 RESPONSIBILITIES

3.1 STA / Incident Advisor

Responsible for performing dose assessments until relieved by an on-call ERO Member.

3.2 Dose Projection HP

Once the EOF takes control of offsite radiological assessment the Dose Projection HP is responsible for performing dose assessments until the event is terminated.

3.3 Chemistry Effluent Manager

Once the TSC is manned, the Chemistry Effluent Manager is responsible for performing dose assessments if required for the TSC.

4.0 PROCEDURE

4.1 General Instructions

4.1.1 URI is not to be used for UE classification.

4.1.2 If in a declared emergency and an offsite dose or dose rate projection is needed, or if so directed, use URI to perform offsite dose calculations.

4.1.3 Access the Plant Data Information System (PDIS) through the electronic Distributed Network Architecture (eDNA) software to obtain and monitor key radiation monitor, meteorological, and Plant effluent data.

a. At a LAN supported computer:

1) Double click on the "eDNA View" icon on the Desktop, if available. If no "eDNA View" icon is available, open eDNA through the network folder and select eDNA View.

2) Select CGS, then "PDIS", and "Rad Status" to obtain the "Radiological Status" screen.

- A screen print of the "Radiological Status" screen may be used to capture the current values of radiation monitor, meteorological, and effluent data for tracking changes (setup printer to Landscape mode, and use the "Print Direct" function rather than "Print" from the "File" drop-down menu on the eDNA View "Radiological Status" screen or if the file menu is not available, right click the eDNA screen and select "Print Direct").
- Access other eDNA View screens of PDIS data by selecting the appropriate "eDNA View (*.rtv)" in the Application Service Utility window, as desired.
- Graphical trends of the plant parameters displayed on the eDNA View screens can be displayed by clicking in the appropriate plant parameter display box. The time span of the graphical trend may be modified by selecting "Modify Graph Parameters" in the "Graph" pull-down menu, selecting the "Graph" tab, and entering the desired date and time range (click to check the "Y-Axis Auto Scale" box for a clearer graph).

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- 3) Area Radiation Monitor (ARM), effluent monitor (TEA, WEA, PRM and SDM, and meteorological data are also available through eDNA applications (e.g., eDNA Real-Time Client or eDNA Trend) from the Start menu/All Programs/eDNA folder and selecting the appropriate ENW Service (e.g., ENW.CGS, ENW.WRM, etc.).

- 4.1.4 Use URI to estimate doses within 15 minutes of a start of a release or as information becomes available. Also use URI to estimate offsite dose during rapidly changing meteorological conditions or release conditions as appropriate.
- 4.1.5 Start URI by double-clicking on the appropriate icon on the Desktop or start from the "C" drive.
- 4.1.6 If necessary, refer to Attachment 7.1, URI User Guidance, which provides detailed guidance on using URI.
- 4.1.7 Review dose projection printouts, note any qualifying factors as appropriate and brief the RPM or REM on the dose projection.
- 4.1.8 In the EOF/TSC, if any data is suspect, request the Radiation Detection System Engineer or the EOF/TSC Information Coordinator to verify the data.
- 4.1.9 In the event of unmonitored release paths or if instrumentation (including alternate instrumentation) is out of service or off-scale, Field Team results are used to calculate dose projections. Use one of the following processes to assess Field Team results:
 - a. Air sample Excel spreadsheet calculator found on the Window Desktop
 - 1) Enter the cartridge and background readings, and press the tab key to perform the calculation.
 - b. Attachment 7.2, Air Sampling Worksheet Calculation
 - 1) Enter sample and background count rate and sample volume into calculations to determine micro curies/cc ($\mu\text{Ci/cc}$).
 - c. Air Sample Calculator in URI Detailed assessment (preferred)
 - 1) See Attachment 7.1 for details on Air Sample Calculator use.

<p>NOTE: GPS coordinates for the center of the Reactor Pressure Vessel are 119.33278 longitude and 46.47167 latitude</p>

- 4.1.10 Provide the Emergency Worker Dose Adjustment Factor to the REM and Field Team Coordinator for their use in establishing field team exposure limits.
 - a. If the Dose Adjustment Factor is 5 or greater, use Dose Adjustment Factor of 5.
 - b. On page three of the detailed Dose Assessment Report invert the EDE/TEDE ratios to acquire the Dose Adjustment Factor. Use the EDE/TEDE Ratio with Iodine. If respiratory protection or a thyroid blocking agent (i.e., potassium

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iodide) is being used, then it may be appropriate to use the EDE/TEDE Ratio without Iodine.

Example:

EDE/TEDE ratio with iodine at 2 miles is 0.90 the Emergency Worker Dose Adjustment Factor would be 1.1. (1 divided by 0.9)

- c. If the EDE/TEDE ratio is less than or equal to 0.2, use a Dose Adjustment Factor of 5.

- 4.1.11 If intentionally venting the primary containment, perform dose projection assessment using Reactor Building Exhaust radiation monitors or field team data as applicable. Venting is a puff release and thus release duration for intentional venting is one hour.

4.2 Dose Estimation Using Rapid URI

NOTE: Use of Rapid URI requires that the release pathway matches one of the limited options in the Rapid URI software.

- 4.2.1 The following steps will provide guidance on performing a Rapid URI dose assessment with normal met tower and radiation monitors available. See Attachment 7.1 for URI implementation when normal plant indications are not available.
- a. Start the URI software with icon (software on "C" drive if icon missing)
 - b. If not a real event then select "This is a drill"
 - c. Select Rapid – LIGHTNING BOLT icon at top left of startup page
 - d. Select Fuel Clad Damage "Yes", if EAL chart PPM 13.1.1 Table 3 Effluent Monitor reading is Greater Than or Equal to Alert value, otherwise select NO.
 - e. If reactor power is LE 1% (shutdown), select box for Reactor Shutdown
 - f. Verify shutdown date / time – change if needed
 - g. Select CGS 33ft Tower (Channel A primary, Channel B backup) and enter Met data, otherwise use FFTF #9
 - h. Enter Release Duration – for ongoing release round up to next hour and add two
 - i. Select Release Point Pathway – NOTE ensure correct release point pathway is selected; might have to go to "Detailed" URI
 - j. Select an Effluent Monitor that has valid and on-scale data for selected pathway
 - k. Enter the monitor reading for the selected monitor
 - l. Enter the Release Point Flow Rate, if SGT is running and Reactor Building Exhaust Fans are shutdown; use the total of the running SGT train flowrates.
 - m. Select "Process Assessment" button. A green progress bar will be displayed. Typical calculation times will be less than 20 seconds.
 - n. When complete, a graphic of affected areas that may require protective action will be displayed
 - o. Double click on the protective action display to show a pop-up of the dose results table.

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NOTE: To perform an additional calculation, change any or all input values as needed and select the Process Assessment button again. If only changing one field, it may be necessary to click out of that field to get the Process Assessment button to appear.

- 4.2.2 See Attachment 7.1, URI User Guidance, for URI use when normal plant indications are not available.
- 4.2.3 Select Print to Default Printer (printer icon, upper left corner of page) to produce a paper output.
- 4.2.4 URI has the capability of summing dose assessments from multiple release points, proceed as follows.
 - a. Clicking on the sigma icon in the upper left of the screen will bring up the Assessment Summations table. Minimize this screen for later use.
 - b. Clicking on the plus icon in the upper right of the screen will add the latest assessment to the summations table.
 - c. Run a new dose assessment and click on the plus icon to sum the two dose projections. Assessments performed earlier can be added to the summations table by clicking on the browse button in summations table.
 - d. A combined dose assessment report and evacuation area map appears at the bottom of the summations table.
- 4.2.5 Have the REM or RPM compare URI output at 1.2 miles for EALs per PPM 13.1.1 and for potential protective action recommendations beyond 10 miles per PPM 13.2.2.
- 4.2.6 Have ED, RPM, or REM sign printed data for distribution.
 - a. Forward to the Emergency Director for approval prior to releasing data for distribution.
 - b. In the Control Room the Shift Manager as Emergency Director has approval authority.
 - c. The Washington Senior State Official approves release data for distribution during the ingestion phase.
- 4.2.7 Distribution of Maps and Data
 - a. Any dose projection maps or data printouts selected for distribution to offsite agencies shall have REM and Emergency Director review and approval.

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4.3 Dose Estimation Using Detailed URI

- 4.3.1 See Attachment 7.8, Detailed URI, for dose assessment performance.
- 4.3.2 URI has the capability of summing dose assessments from multiple release points.
 - a. Selecting the sigma icon in the upper right of the screen will bring up the Assessment Summations table. Minimize this screen for later use.
 - b. Selecting the plus icon in the upper right of the screen will add the latest assessment to the summations table.
 - c. Run a new dose assessment and click on the plus icon to sum the two dose projections. Assessments performed earlier can be added to the summations table by clicking on the browse button in summations table.
 - d. A combined dose assessment report and evacuation area map appears at the bottom of the summations table.
- 4.3.3 The Washington Senior State Official approves release data for distribution during the ingestion phase.
- 4.3.4 Distribution of Maps and Data
 - a. Any dose projection maps or data printouts selected for distribution to offsite agencies shall have REM and Emergency Director review and approval.
 - b. Maps selected for distribution should always be accompanied by the data. This is very important because the plume projected on the map is not closed and without the data sheet, the plume may be misinterpreted.
- 4.3.5 For Plume map, select "View Receptor Point Locations" (World) icon in the upper left of screen under "View"
 - a. Recommend selecting RASCAL puff grids and Show Balloons.
 - b. Hover above grid point with cursor to obtain grid projected dose.
 - c. Print option is in lower right hand corner of map screen.

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5.0 REFERENCES

5.1 Documents

- 5.1.1 EP-01, Emergency Plan
- 5.1.2 10 CFR 50 .47(b) Planning Standard
- 5.1.3 GI2-03-020, Elimination of Requirements for Post-Accident Sampling System
- 5.1.4 NUREG-0654, FEMA REP-1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
- 5.1.5 NUREG 1228, Source Term Estimation During Incident Response to Severe Nuclear Power Plant Accidents
- 5.1.6 RSCS TSD-13-035 (CVI 1057-00,131) TEA and WEA replacement
- 5.1.7 NE-02-09-12 CGS Emergency Action Levels (EALs) Technical Bases
- 5.1.8 NE-02-10-05 URI
- 5.1.9 FW-SOFT-COTS-RASCAL and FW-SOFT-COTS-URI
- 5.1.10 CR 244578, CMR changed EAL classification value without adequate 50.54q
- 5.1.11 SQA SDD SDD-PDIS-01, Plant Data Information System Software Design Description
- 5.1.12 Radiation Protection Calculation 15-04, Calculation of Iodine Air Sampling Cartridge Efficiencies

5.2 Procedures

- 5.2.1 PPM 13.1.1, Classifying the Emergency
- 5.2.2 PPM 13.2.1, Emergency Exposure Levels/Protective Action Guides
- 5.2.3 PPM 13.2.2, Determining Protective Action Recommendations
- 5.2.4 PPM 13.14.11, EP Equipment

6.0 DOCUMENTATION

All logs, forms and records completed as the result of implementing this procedure during an actual declared event shall be retained as permanent plant records. Transmit documents to the Permanent Plant File under DIC 2304.2.

A sub-set of documents generated during drills shall be maintained in the Emergency Preparedness Department files, as necessary, to support completion of drill/exercise commitments.

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7.0 ATTACHMENTS

7.1 URI User Guidance

7.2 Air Sampling Worksheet Calculation

7.3 Alternate Method for Obtaining Met Data

7.4 Computer Points Used in the eDNA View Radiological Status Screen

7.5 Alternate Method for PRM Stack Monitor

7.6 Alternate Method for TEA-RIS-13 or WEA-RIS-14

7.7 Alternate Method for ARM or OG-RIS-612

7.8 Detailed URI

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URI User Guidance

1.0 OVERVIEW

- 1.1 For ease of explanation, the different sections of the URI screen will be described as "groupings" with the name in the upper left of the grouping as the title of that grouping.
- 1.2 Options used in the Source Term Grouping will determine which options will be available in succeeding grouping.
- 1.3 The red octagons with the exclamation point inside are warnings that an option needs to be selected or information filled in to before the calculation can be performed. A message also appears in the lower left hand corner of the page stating that all errors must be resolved to complete the calculation. If the cursor is placed over the octagon, a message is provided that will describe the range of the input variable.
- 1.4 Holding the cursor over a box will often result in the program providing information about the contents of the box.
- 1.5 Options used in the Release Point Pathway Grouping will determine which inputs to the Process Reduction Factor will become available.
- 1.6 Options used in the Release Point Pathway Grouping will determine which options will be available in the Assessment Methodologies Grouping.
- 1.7 Notes: Stack Door Monitor (SDM) is a direct monitored input option. FFTF delta-T is a direct input for stability class. CGS has committed to performing ground release assessments; so only ten meter Met conditions should be selected.
- 1.8 During the ingestion phase, determine manual contour lines on the 10-50 mile map by selecting grid and balloon options to determine the projected 500 μ R (relocation boundary), 20 μ R and 0.4 μ R (food control boundary).

2.0 Rapid URI

Activate Rapid URI by selecting the Rapid option (upper right hand corner) on the URI main screen. The Rapid Assessment page is now available for data input.

- 2.1.1 Source Term Grouping (this grouping provides input on what type of damage to the fuel has occurred)
 - a. In the Source Term box, answer the initial question concerning Fuel Clad Damage. If damage to the core is suspected (PPM 13.1.1 Table 3 Effluent Monitor reading is GT Alert value), or Field Team data shows a release in progress, select "yes". This causes the assessment to include isotopic mix and inventory for fuel clad damage.
 - b. Selecting Fuel Clad Damage "No" causes selection of normal coolant concentrations as the basis of the source term. This also activates the Conditions for Coolant Spiking question. Select "Yes" if Reactor Building process radiation monitors spike following a plant transient; otherwise select "No".

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- c. Check the "Reactor Shutdown" box if appropriate and enter date of shutdown using the pull down calendar. Overwrite the indicated time as necessary.
- d. Select Damaged Spent Fuel Assembly for any Spent Fuel Pool handling accidents. This will change the Reactor Shutdown date/time box to "Last Irradiated" and allow input of when the spent fuel was last irradiated. This should be 5/11/19. (CGS does not have the ability to update software.)

2.1.2 Meteorological Data Grouping (this grouping allows input of meteorological data pertinent to the release)

NOTE: If Primary Met Tower information is not available, see attachment 7.3 for obtaining alternate met tower information. {5.1.4}

NOTE: Met Data is normally taken from the eDNA View "Radiological Status" or PDIS Rad Status display. Met Channel A is primary input, Channel B is backup input. IF any parameter cannot be obtained from eDNA View or PDIS THEN refer to Attachment 7.3, Obtaining Alternate Met Data, to determine appropriate Stability Class.

NOTE: If the wind direction value is greater than 360° subtract 360 from value before entering it into URI program.

- a. Select one of the three choices of met tower input to be used. Meteorological parameters from the primary met tower are normally available on the Radiological Parameters screen. If the primary met tower (default) is not selected, the program will provide a notification of this.
- b. Input Wind Speed and Wind Direction data. Wind Speed range is GE 0 to LE 60 mph. Wind Direction range is GE 0 and LT 360
- c. Input delta T or select appropriate Stability Class from the pull down menu. Delta T range is GT -10 to LE 10.
- d. Use the pull down menu to select the appropriate level of precipitation.

2.1.3 Release Duration Grouping (this grouping allows input on how long the release has been in progress)

- a. Provide release duration in hours and minutes. This function defaults to 3 hours. If End of Release is not known, a default value of the time of the release is rounded up to the next hour plus two hours should be used.
- b. EXAMPLE: Release has lasted for 25 minutes. Round 25 minutes up to 1 hour and add 2 hours to give a release duration of 3 hours.

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2.1.4 Release Point Pathway Grouping (this grouping allows input on where the release originates from and its path for leaving the plant)

NOTE: A Radwaste building release pathway is only available in Detailed URI

- a. Select the appropriate release path from the available list. A description of the pathway will appear as the cursor is held over the individual pathways. A list of available monitors will also be displayed. Choose the pathway that best matches the conditions of the release in progress.
- b. Selections made in the Source Term Grouping will determine which release paths are available.
- c. The release path selected will determine which effluent monitors will be available.
- d. The release path selected will also determine the Process Reduction Factor (PRF) applied to the calculation of the offsite dose. **IF SGT is running the Rx Building hold up time needs to be changed to 2-24 hours.**
- e. The pathway and assumptions for the input to the PRF are displayed in the lower right portion of the screen.

NOTE: In the event of a loss of SM-8, the PRM Stack Monitors and the MET tower will be out of service (OOS). Alternate indications of Reactor Building effluents can be obtained from the Stack Door Monitor. Use the readings from the Stack Door Monitor to input directly into URI. Meteorological information can be obtained from FFTF.
In the event of a loss of SM-7, PRMs for Turbine and Radwaste buildings are OOS. Alternate methods for TEA and WEA monitors are the sample carts.

2.1.5 Release Point Information Grouping (this grouping allows input on the condition of the monitors at the release point)

- a. Select "Yes" if effluent monitors are available. Depending on the Pathway selected, Turbine or Reactor Building monitors will be made available for selection in the Monitor Grouping.
 - 1) Select the monitor to be used
 - 2) Provide the appropriate reading in the Reading box, ensuring the units are correct
 - 3) Verify the Release Point Flow Rate is correct or revise default value to accurately reflect plant conditions. If SGT is running and Reactor Building Exhaust Fans are shutdown; use the total of the running SGT train flowrates. If building exhaust flow indication is lost, the Control Room should be contacted to determine flow rate via ODCM 6.1.2.D method.
 - 4) Click on the Process Assessment button to run a Rapid Assessment based on the supplied input data.

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- b. Select "No" if effluent monitors are not available. This action will bring up several options for input.
 - a) If RCS leakage is suspected, select "Estimated RCS Leak Rate", fill in a known leak rate or select the "I Don't Know" option. Click on the Process Assessment button to run a Rapid Assessment based on the supplied input data.
 - b) If "Containment Leakage" is selected (only available if a Pathway from the Drywell has been selected), select either containment high rad monitor and provide an appropriate reading in the R/hr box or select "No HRA Available or Applicable". Click on the Process Assessment button to run a Rapid Assessment based on the supplied input data.
- c. If Damaged Spent Fuel Assembly is selected in the Source Term Grouping and no effluent monitors are available, proceed as follows.
 - a) Select "Unmonitored Damaged Spent Fuel Assembly". Click on the Process Assessment button to run a Rapid Assessment based on the supplied input data.

3.0 Detailed URI

Activate Detailed URI by selecting the Detailed option (upper right hand corner) on the URI main screen. The Detailed Assessment page is now available for data input.

3.1.1 Source Term Grouping (this grouping provides input on what type of damage to fuel has occurred)

- a. In the Source Term box, select "Normal Coolant" if there is no core damage (No PPM 13.1.1 Table 3 Effluent Monitor reading is GE Alert value or Field Team data shows a release is not in progress). Select Spiking Factor if Reactor Building process radiation monitors spike following a plant transient. The numerical Spiking Factor defaults to "30".
- b. Reactor Core Accident is selected if there is actual or suspected damage to fuel assemblies. Technical support or core damage procedures should be used to estimate the extent of core damage.
 - 1) The Clad damage option is selected if the core conditions have caused the fuel pin cladding to fail but the core temperature has not become sufficiently high to cause melting of the ceramic fuel matrix.
 - 2) The Melt option is selected if SAGs are entered and core has been uncovered for greater 30 minutes.
- c. The Spent Fuel Accident option is selected if the incident involves damage to spent fuel in a depressurized condition.
 - 1) Select "Old" for Fuel Age. "New" is not a valid option for CGS.
 - 2) "Fuel Status" and "Amount of Spent Fuel Damage" will be provided by the software when the Selected Pathway Option is selected. This will also provide the estimated % damage based on the water level in the Spent Fuel Pool.

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- 3) Checking the "Unmonitored Spent Fuel Accident with No other method applicable" box is only done when there is no other option for determining spent fuel source term due to loss of building integrity, loss of monitors, or other major failure making source term assessment unavailable.

3.1.2 Meteorological Data Grouping (this grouping allows input of meteorological data pertinent to the release)

NOTE: If Primary Met Tower information is not available, see attachment 7.3 for obtaining alternate met tower information. {5.1.4}

- a. Select one of the four choices of "site" met tower input to be used. The two FFTF towers are considered "site" met towers. Meteorological parameters from the primary met tower are normally available on the Radiological Parameters screen. If the primary met tower (default) is not selected, the program will provide a notification of this.
- b. Input Wind Speed and Wind Direction data. Wind Speed range is GE 0 to LE 60 mph. Wind Direction range is GE 0 and LT 360. Double clicking on the Wind Direction box will bring up a depiction of a compass that may assist in selecting wind direction.
- c. Input delta T or select appropriate Stability Class from the pull down menu. Delta T range is GT -10 to LE 10. Attachment 7.3 has additional information in determining Stability Class.
- d. Use the pull down menu to select the appropriate level of precipitation.

3.1.3 Reactor Status Grouping (this grouping allows input of reactor status or time since the last time the spent fuel was irradiated)

NOTE: For ATWS Conditions:
 IF reactor power is GT 1%: leave the Time Since Reactor Shutdown value set to zero unless the Main Control Room (MCR) states the reactor is shutdown.
 IF reactor power is LE 1%: Contact the MCR, use the amount of time from when the MCR declares reactor shutdown.

- a. When "Normal Coolant" or "Reactor Core Accident" is selected in the Source Term Grouping, "Reactor Status" will be shown next to the check box. If the Reactor is shutdown, click in this box. Change the date/time box to reflect actual shutdown if needed. The "TAS" box will update automatically. Time after shutdown can be entered directly into the "TAS" box by double clicking in the box.
- b. Select Spent Fuel Accident for any spent fuel handling accidents in the Spent Fuel Pool. This will change the Reactor Shutdown date/time box to "Last Irradiated" and allow input of when the spent fuel was last irradiated. This should be 5/11/19. (CGS does not have the ability to update software.)

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3.1.4 Release Duration Grouping (this grouping allows input of the duration of the release)

- a. Provide release duration in hours and minutes. This function defaults to 3 hours. If End of Release is not known, a default value of the time of the release is rounded up to the next hour plus two hours should be used. Release duration must be input in 15 minute increments. Range is 15 min to LE 48 hours.

EXAMPLE: Release has lasted for 25 minutes. Round 25 minutes up to 1 hour and add 2 hours to give a release duration of 3 hours.

3.1.5 Selected Pathway Options Grouping (allows input as to the release flow path and inputs to the Process Reduction Factor)

- a. To view the list of available pathways, click on the small yellow box to the right of the "Pathway" box. This action will take you to the Pathways screen. Available pathway options will depend on selections made in the Source Term Grouping. A description of the pathway will appear as the cursor is held over the "Path" box to the right of the pathway to be selected. A list of available assessment methodologies will also be displayed. Choose the pathway that matches the conditions of the release in progress.
- b. The pathway chosen will determine which "Process Reduction Factors" (PRF) will be used in the dose calculation. Hold-up times can be changed from the default values. Other options include use of Drywell sprays, condition of the Suppression Pool, and whether SGBT is working (operable with no high moisture alarms). **If SGT is running, Rx Building hold up time needs to be changed to 2-24hrs.**
- c. When pathway has been selected and PRF options have been made, click on the "Accept" button. This action will return you to the main Detailed Assessment screen. The pathway chosen will be displayed in the "Pathway" box. The PRF will be displayed under the "Pathway" box along with inputs to the PRF.

NOTE: In the event of a loss of SM-8, the PRM Stack Monitors and the MET tower will be out of service (OOS). Alternate indications of Reactor Building effluents can be obtained from the Stack Door Monitor. Use the readings from the Stack Door Monitor to input directly into URI. Meteorological information can be obtained from FFTF.
In the event of a loss of SM-7, PRMs for Turbine and Radwaste buildings are OOS. Alternate methods for TEA and WEA monitors are the sample carts.

3.1.6 Assessment Methodologies Grouping (allows input to the dose assessment calculation depending on available monitors, leakage rates, samples taken, or field team results, depending on available information)

- a. Monitored TAB (available when chosen Pathway is monitored by installed or temporary plant radiation monitor)
- 1) Release Point: The release point is based on the Selected Pathway chosen. No input required

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- 2) Monitor: Select the radiation monitor you wish to use or select the building as appropriate.
 - 3) Release Point Flow Rate: Input real time data from plant computer system/instrument readings.
Range for Reactor and Radwaste buildings is GE 0 to LE 2E6 CFM,
Range for Turbine Building is GE 0 to LE 5E6 CFM.
IF SGT is running and Reactor Building Exhaust Fans are shutdown; use the total of the running SGT train flowrates.
If building (RB, RW, TB) exhaust flow indication is lost, the Control Room should be contacted to determine flow rate via ODCM 6.1.2.D method.
 - 4) Monitor Reading: Input real time data from plant computer system or instrument readings. Ensure units match those in the program.
Range is GE 1E-7 to LE 1E+6 $\mu\text{Ci/cc}$ for the PRM Stack Monitor,
GE 0 to LE 1E3 $\mu\text{Ci/cc}$ for TB and RW bldgs.
- b. Containment Leakage TAB (available when chosen Pathway originates inside containment)
- 1) Method
 - a) Normal Coolant /w Spiking Factor
 - b) % Fuel Damage range is GE 0 to LE 100%
 - c) Containment Radiation Monitors range is GT 0 to LE 1E7 R/hr
 - 2) Release Mode
 - a) Leakage range is GT 0 to LE 100%
 - b) Failure to Isolate
 - c) Catastrophic Failure
 - d) Calculated Containment Leak Rate range is GT 0 cfm
- c. RCS Leakage TAB (available for all chosen Pathways except Spent Fuel Pool) is used when the release pathway does not include normal plant effluent monitors (or they are unavailable).
- 1) Method
 - a) Normal Coolant /w Spiking Factor
 - b) % Fuel Damage range is GE 1 to LE 100%, used when the Core Damage option is selected in the Source Term Grouping. The amount of core damage should be entered as obtained from TSC Core Thermal Engineer or STA.
 - 2) Release Mode
 - a) Unknown Release Mode
 - b) Calculated RCS Leak Rate range is GE 1 to LT 1E6 gpm

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- d. Release Pt. Sample TAB (available for all chosen Pathways except those directly releasing to the environment) is used when there is a valid sample collected from the effluent release point.
 - 1) Release Point Data, no discernable range in SCFM, enter actual release point flow rate from the time of sample. If SGT is running and Reactor Building Exhaust Fans are shutdown, use the total of the running SGT train flowrates. If building (RB, RW, TB) exhaust flow indication is lost, the Control Room should be contacted to determine flow rate via ODCM 6.1.2.D method.
 - 2) Isotope Box range is GE 0 to 1E4 $\mu\text{Ci/cc}$, enter the observed concentrations of each identified isotope
- e. Field Team TAB (available for all chosen Pathways) is used to estimate the source term and to calculate a complete dose projection based on readings obtained from monitoring teams in the field.
 - 1) Analysis Basis
 - a) Downwind (Miles) range .25 to 10 miles (1.2 miles is SB)
 - b) Exp. Rate (mR/hr) range 0.1 to 99999.9 data must be based on observations in the centerline of the plume
 - c) I-131 Conc. ($\mu\text{Ci/cc}$) range 1E-11 to 1E11 $\mu\text{Ci/cc}$, data must be based on observations in the centerline of the plume. This field is auto filled in when using the Air Sample Calculation. To use the Air Sample Calculation:
 - (1) Bring up Air Sample Calculation screen by selecting it from the Calculations TAB in the upper left of the URI Detailed screen.
 - (2) Select Count Rate Meter from the Iodine Cartridge Instrument pulldown menu.
 - (3) Enter Background and Cartridge Gross count rate
 - (4) Enter Sample Flow Rate and Sample Collection Time
 - (5) Press Enter and then the "Transfer to Field Team Calc" button
 - (6) The Iodine concentration is transferred to the Field Team Tab for use in the assessment.
 - d) Survey Date/Time, enter date and time of sample taking
 - 2) Travel Information
 - a) "Travel Time" is derived from the "Downwind (Miles)" input and the Wind Speed used in the Meteorological Data Grouping section. No input required.
 - b) "Release Time" is derived from "Travel Time" and the date/time used in the "Survey Date/Time" box. No input required.

END

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Air Sampling Worksheet Calculation

1. **Cartridge Filter: AgZ Filter**

NOTE: $1.89 \times 10^8 = 0.003 \text{ (eff)} \times 2.83 \times 10^4 \text{ cc/ft}^3 \times 2.22 \times 10^6 \text{ dpm/}\mu\text{Ci}$

(Sample CPM: _____) - (Background CPM: _____) = Net CPM _____

$$\frac{\text{Net CPM}}{(1.89 \times 10^8) \times (\text{sample volume ft}^3)} = \text{_____ } \mu\text{Ci/cc I Activity}$$

2. **Particulate Filter**

NOTE: $5.65 \times 10^9 = 0.09 \text{ (eff)} \times 2.83 \times 10^4 \text{ cc/ft}^3 \times 2.22 \times 10^6 \text{ dpm/}\mu\text{Ci}$

(Sample CPM: _____) - (Background CPM: _____) = Net CPM _____

$$\frac{\text{Net CPM}}{(5.65 \times 10^9) \times (\text{sample volume ft}^3)} = \text{_____ } \mu\text{Ci/cc Particulate Activity}$$

END

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Alternate Method for Obtaining Met Data

NOTE: In the event of a loss of SM-8, the MET tower will be out of service.

1. IF Met Channel A instrument data is not available through the eDNA View "Radiological Status" screen, then the corresponding Met Channel B data should be used. If neither Met Channel A nor Met Channel B data is available, then alternate indications should be obtained from the following sources in the order given: {5.1.4}

- Hanford Internet Site Weather Page (primary alternate):

Select the Hanford weather icon to access the FFTF (400 Area, Station #9) meteorological information via the Internet.

IF the icon is not available, THEN start Internet Explorer and enter the following address:

<http://www.hanford.gov/page.cfm/hms>

When the icon is selected on the desktop, either a Hanford site map or the data for FFTF will be displayed. IF the Hanford site map is displayed, THEN select the 400 Area (Station # 9) to view the FFTF data. (Use Station #11 if #9 is not available and #13 last if necessary. These 3 Stations have delta T, which can be used to determine Stability Class.)

Use the wind speed and direction for the 10 meter height since a ground level release is assumed. Take 60m minus 10m temperature reading and enter into FFTF delta-T at 10 meter tower selection.

- Mission Service Alliance (MSA) Weather Forecaster (secondary alternate) at 373-2710

Request wind speed, direction, and differential temperature for the FFTF met tower. If this information is not available from the MSA forecaster, contact the National Weather Service.

- Telephone the National Weather Service Forecaster (tertiary alternate) at one of the following locations:

1-541-276-8234 Pendleton, Oregon (Primary)

1-206-526-6083 Seattle, Washington (Secondary)

Request the following met data for the Hanford weather station: Wind speed (in MPH), wind direction, and atmospheric stability. The National Weather Service does not provide a temperature differential. The NWS will describe the stability category as neutral, moderately stable, per step 2a.

- National Weather Service website: <http://www.nws.noaa.gov/>

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2. IF the Stability Class is not shown on the eDNA View "Radiological Status" screen or the PDIS Rad Status screen, THEN determine Stability Class as follows:
 - a. IF the ΔT can be obtained from PN H13-P823 Board L - Met System located in the Control Room via the Information Coordinator, THEN input ΔT into URI to obtain Stability Class.

NOTE: The following table represents CGS ΔT vs Stability Class.
Main Control Room Board L Operator Aid will require updating if the below table is revised

Stability Class vs. Temperature Change for Station Met Tower		
Stability Classification	NRC Categories Stability	Temperature Change With Height (°F/212 ft – 75m – 10m)
Extremely unstable	A	$\Delta T \leq -2.2$
Moderately unstable	B	$-2.2 < \Delta T \leq -2.0$
Slightly unstable	C	$-2.0 < \Delta T \leq -1.7$
Neutral	D	$-1.7 < \Delta T \leq -0.6$
Slightly stable	E	$-0.6 < \Delta T \leq 1.7$
Moderately stable	F	$1.7 < \Delta T \leq 4.7$
Extremely stable	G	$\Delta T > 4.7$

- b. IF no ΔT is available, THEN use the following table to determine Stability Class:

Stability Class Determination							
Surface Wind Speed (mph)	Daytime Solar Radiation (For moderate cloud cover move one column to the right)				Nighttime Conditions		
	Summer Clear Sky	Spring/Fall Clear Sky	Winter	Heavy Overcast Rain	Thin overcast ($>1/2$ cloud cover)	$< 3/8$ cloud cover	Heavy Overcast Rain
< 4.5	A	B	B	D	F	F	D
to 6.7	A	B	C	D	E	F	D
to 11.0	B	C	C	D	D	E	D
to 13	B	D	D	D	D	D	D
> 13	C	D	D	D	C	D	D

Table developed using guidance in EPA-454/R-99-005 (2000).

END

Computer Points Used In The eDNA View Radiological Status Screen

Radiological Status

ENW.CGS.TIMET

Reactor Power Q012 %

Delta T	Met. Channel A	Met. Channel B
Stability Class	META69 deg F	METB69 deg F
Wind Velocity	META70 Q224A	METB70 Q224B
Wind Direction From	META58 mph	METB58 mph
	META60 deg Az	METB60 deg Az

Rx Exh	X213 cfm	ARM19 Main CR	Q092 mR/hr	TG Exh	X198 cfm
Stack Comp	X415 uCi/cc	W 1 606 Fuel Pool	Q093 mR/hr	COMP	X409 uCi/cc
Stack Lo	X396 uCi/cc	E*34 606 D/SEP	Q085 R/hr	NG Low	L107 uCi/cc
Stack Int	X397 uCi/cc	N 8 572 SGTS	Q086 mR/hr	Effluent	X394 uCi/s
Stack Hi	X400 uCi/cc	S 6 572 ROA	Q096 mR/hr		
Plnm A	X079 mR/hr	E 4 572 CRD	Q094 mR/hr	RW Exh	X366 cfm
Plnm C	X094 mR/hr	W 5 572 CRD	Q095 mR/hr	COMP	X408 uCi/cc
Cntmt E	X432 R/hr	NW*33 501 Entry	Q084 R/hr	NG Low	L109 uCi/cc
Cntmt F	X399 R/hr	NE 7 501 TIP	Q097 mR/hr	Effluent	X393 uCi/s
DW Press	Q022 psig	NE*32 471 Elev#1	Q083 R/hr		
DW Temp	Q047 deg F	W 24 471 Valve	Q099 mR/hr	Cntmt NG	X469 uCi/cc
FDR Sump	Q041 gpm	W 9 422 RHR-A	Q087 mR/hr	1 Part	X470 uCi/cc
EDR Sump	Q039 gpm	W 10 422 RHR-B	Q088 mR/hr	2 NG	X398 uCi/cc
		N 11 422 RHR-C	Q089 mR/hr	2 Part	X413 uCi/cc
SGTS A1	X466 cfm	S 23 422 CRD	Q098 mR/hr		
SGTS A2	X356 cfm	N 12 422 RCIC	Q090 mR/hr	Treatment	
SGTS B1	X452 cfm	E 13 422 HPCS	Q091 mR/hr	Pre-Treat	X073 mR/hr
SGTS B2	X371 cfm			Post-Treat	X088 uCi/cc

END

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Alternate Method for PRM Stack Monitor

NOTE: When the low range detector purges and transfers to the medium range detector the low range will show downscale. The alarms on H13-P602 will clear during the purge and then come back in after the purge is complete; this takes about three minutes. The medium range and composite will remain reading at all times (power allowing). eDNA will turn red on the Composite and remain red at the Alert alarm value; the ALERT alarm is NOT an EAL Alert, but is a warning you are approaching an EAL UE. GDS Overview has the stack composite value at the bottom of the screen. The E1 Containment and eDNA Containment Status reads the Composite for all PRMs. IF the sample rack loses power for GT 4 seconds, the Sample Rack (and pumps) will go through an auto-reboot process where no data is available to the MCR for ~ 2 to 3 minutes after power is regained; expect this if regaining SM-8 power from DG2.

A portable radiation survey meter or an installed radiation monitoring instrument measuring radiation levels at the exterior center of the Elevated Release Stack Access Door (R-DOOR-R515) provides an alternate means of monitoring radioactive effluent releases through the Reactor Building Stack when the installed post-accident effluent monitor PRM Stack Monitor is unavailable. The radiation level readings (in mR/hr) from this Stack Door Monitor (SDM) can be input into the Monitor Reading field in URI to perform a dose projection. The technical basis for this SDM to PRM equivalency can be found in Engineering Calculation NE-02-09-12. The use of the table may be used for Table 3 equivalency if needed i.e., URI is not available. Note: for the UE value, background at 100% power is ~4.1 mr/hr.

Data from eDNA Points EP99M (mid-range SDM, 5 mR/hr to 1E6 mR/hr) and EP99H (high-range SDM, 1000 mR/hr to 1E7 mR/hr) is updated approximately every minute and is displayed in mR/hr. Always round to the nearest whole number (e.g., 23.645 mR/hr should be rounded to 24 mR/hr).

When Stack Door Monitor net reading is (mR/hr)	Table 3 Equivalent ($\mu\text{Ci/cc}$)	Action Notes (based on filtered releases)
8	3.05E-3 (11)	PPM 13.1.1 Table 3 Unusual Event EAL threshold*
12,100	2.82E+01 (12)	PPM 13.1.1 Table 3 Alert EAL threshold*
1.21E5	7.50E+01 (13)	PPM 13.1.1 Table 3 Site Area Emergency EAL threshold*
1.21E6	7.50E+02 (13)	PPM 13.1.1 Table 3 General Emergency EAL threshold*

*If URI is not available.

END

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Alternate Method for TEA-RIS-13 or WEA-RIS-14

Compensatory Noble Gas Monitor (CNGM) sample cart(s) will be available to measure radiation levels as a compensatory measure when the normal sample racks for TEA-RIS-13 and/or WEA-RIS-14 are unavailable. There is one cart for TEA, and a different cart for WEA readings. While the equations below apply directly to the readings from either cart, it is critical to ensure that the WEA cart readings are only used for WEA dose assessments and TEA readings be used for TEA dose assessments. IF both WEA and TEA are non-functional, then both carts will be in operation and the dose assessments must be derived from the respective cart.

The technical basis for this compensatory measure equivalency can be found in RSCS TSD-13-035 (CVI 1057-00,131). The conversion equations below are used for calculating equivalent inputs for URI. Data from the CNGM will be available to the Main Control Room for monitoring a release during this compensatory measure. There is a slide at the frisker which is inserted for normal readings LTE 400,000 cpm and withdrawn for readings GT 400,000 cpm.

- 1) IF URI is unavailable, THEN use Table 3 of PPM 13.1.1 to classify.
- 2) IF frisker reading is GT 400,000 cpm, THEN direct Chemistry to withdraw the CNGM slide.
- 3) IF calculating TEA values to input into URI, then use the following conversion factors, otherwise N/A this step:
 - IF TEA frisker reading is LTE 400,000 cpm, slide inserted (Low Range Input) THEN
TEA URI INPUT ($\mu\text{Ci/cc}$) = [Frisker output (cpm)] / 1.01E7 cpm/ $\mu\text{Ci/cc}$
 Example: the frisker reading obtained from the sample cart is 80,000 cpm. The equivalent URI input for either TEA or WEA would be:
 TEA 80000 cpm divided by 1.01E7 cpm/ $\mu\text{Ci/cc}$ = 7.92e-3 $\mu\text{Ci/cc}$
 Enter this value into URI for the TEA monitor.
 - IF frisker slide is withdrawn, THEN
TEA URI INPUT ($\mu\text{Ci/cc}$) = [Frisker output (cpm)] / 3.87E6 cpm/ $\mu\text{Ci/cc}$
- 4) IF calculating WEA values to input into URI, then use the following conversion factors, otherwise N/A this step:
 - IF WEA frisker reading is LTE 400,000 cpm, slide inserted (Low Range Input) THEN
WEA URI INPUT ($\mu\text{Ci/cc}$) = [Frisker output (cpm)] / 1.01E7 cpm/ $\mu\text{Ci/cc}$
 - IF frisker slide is withdrawn, THEN
URI INPUT ($\mu\text{Ci/cc}$) = [Frisker output (cpm)] / 3.98E6 cpm/ $\mu\text{Ci/cc}$

END

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Alternate Method for ARMs or OG-RIS-612

This attachment will provide direction to establish and maintain alternate method(s) for one or more inoperable ARMs or OG-RIS-612.

The following ARMs are used for EAL classification per PPM 13.1.1: ARM-RIS-1, ARM-RIS-2, ARM-RIS-4 thru 13, ARM-RIS-19, ARM-RIS-23, ARM-RIS-24, ARM-RIS-30, and ARM-RIS-32 thru 34. HP will install the alternate methods, in accordance with the requirements of PPM 11.2.9.32 and the tables within this instruction. One disabled ARM power supply can disable multiple ARMs.

OG-RIS-612 is used for EAL classification per PPM 13.1.1. HP will establish the alternate method, as described in PPM 11.2.24.2 Attachment 8.5.

1.0 PORTABLE ARMS:

The wireless remote radiation monitoring devices to be used are PAM-TRX and AMP-100.

NOTE: Wireless Radiation monitors cannot be used in the Main Control Room. In the event ARM-RIS-19 is disabled, notify HP to install a non-transmitting portable area radiation monitor with an alarm set-point of 15 mr/hr.

NOTE: In the event of unplanned ARM failures, an hourly H.P. tour of the affected areas should be established until the measures of this attachment are established.

2.0 CONTROL ROOM PERSONNEL:

2.1 Direct HP to establish the applicable compensatory measures as per this attachment.

2.2 During this evolution, area radiation levels will be provided as follows:

- HP will have established wireless remote monitors into each of the areas affected, in accordance with the requirements of PPM 11.2.9.32. These monitors will provide indication to a remote monitor in the HP access area.
- In the event an area radiation level meet or exceed an ARM set-point identified by PPM 4.602.A5, the Control Room will be notified immediately. These indications should be treated as actual ARM indications. Consider directing continuous monitoring. The Control Room will be notified immediately of instrument failure.
- In the event of an emergency classification of ALERT or higher, this information will be available by request of the TSC. Continuous monitoring is not required.
- In the event that OG-RIS-612 has been replaced with an area radiation monitor, EAL classification can be made based on area radiation monitor indication that is equivalent to OG Pretreatment Hi-Hi alarm. Refer to ODCM 6.1.2.1.

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3.0 HP DEPARTMENT STAFF:

- 3.1 For ARMs, establish wireless remote monitors, in accordance with the requirements of PPM 11.2.9.32, in each of the affected areas, as directed by the Control Room.
- 3.2 For OG-RIS-612, establish the compensatory measures, as described in PPM 11.2.24.2 Attachment 8.5.
- 3.3 Ensure a knowledgeable individual is stationed at a monitor to observe the read-outs from each of the wireless remote monitors. Also ensure telephone communication is established with the Control Room.
- 3.4 Provide direction to the knowledgeable individual to ensure the following is clearly understood:
- The radiation indications to be monitored.
 - Until released by the Control Room, remain available. Check the remote monitor radiation levels at least every 15 minutes. This may be more frequent or continuous, as directed by the Control Room.
 - Notify the Control Room if radiation levels on any monitor increase above an ARM set-point or 10 R/hr.
 - Provide the detector locations and the radiation levels observed.
 - Make an HP log entry of the notification and information transmitted.
 - If a monitor indication fails (excluding "LOST CONTACT" for less than 10 minutes), IMMEDIATELY notify the Control Room.

4.0 ARMs by Power Supply

ARMs 1 thru 10 powered by ARM-E/S-603A

ARMs 11 thru 20 powered by ARM-E/S-603B

ARMs 21 thru 30 powered by ARM-E/S-603C

ARMs 32 thru 34 powered by E-CP-H13/P614

END

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DETAILED URI

The following steps will provide guidance on performing a Detailed URI dose assessment with normal met tower and radiation monitors available.

For multiple release point summing, **REFER** to Section 4.3 step 4.3.2.

1. **START** URI with icon (software on "C" drive if icon missing).
2. **IF** not a real event, **THEN SELECT** "This is a drill".
3. **SELECT** Detailed – CLOUD icon top of startup page.
4. **SELECT** Source Term–
 - **Normal Coolant** -If Normal Coolant is selected, select Spiking Factor if Reactor Building process radiation monitors spike following a plant transient.
 - **Reactor Core Accident** -If Reactor Core Accident – select core condition;
 - CLAD (PPM 13.1.1 Table 3 Effluent Monitor reading is greater than or equal to an Alert value) or
 - MELT (SAGs entered).
 - **Spent Fuel Accident** -If Spent Fuel Accident, select "Old" and specify age based on last refueling outage shutdown, currently 5/11/19.
5. **ENTER** Meteorological data.
 - **SELECT** CGS 33ft Tower (Channel A primary, Channel B backup), if not available, then select FFTF #9 10m.
 - **ENTER** Wind Speed
 - **ENTER** Wind Direction (W/D)
 - **SELECT** Stab Class
 - **SELECT** Precipitation
6. **IF** reactor power is LE 1% (shutdown), **THEN SELECT** box for Reactor Shutdown.
7. **VERIFY** shutdown date / time – **CHANGE** if needed.
8. **VERIFY** TAS (time after shutdown) – **CHANGE** if needed.
9. **ENTER** Release Duration – for ongoing release round up to next hour and add two.
10. **DOUBLE CLICK** yellow Pathway bar to show pathways selection screen.
11. **SELECT** best matching pathway.

NOTE: Factor groupings that are grey do not apply to the selected pathway.

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Continued operation of the SGT system with a high relative humidity can result in a decrease in charcoal filter efficiency due to increased charcoal moisture content, this decrease in efficiency occurs at 70% relative humidity. Decreased filter efficiency is required to be accounted for in the Off-Site Dose Calculations. This is accomplished by selecting "Not Working" for SBTG.

12. **REVIEW** the process reduction factor selections on the bottom of the pathway page. Defaults are specified but these may be changed as needed to better represent the plant status.
IF pathway is through Standby Gas Treatment (SBGT),
THEN CHANGE "Reactor Building Reductions" Hold-Up Time to 2-24 Hours.
THEN SELECT SBGT Status (Working or Not Working)
13. **SELECT** "Accept" on the pathways page.

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NOTE: If TAB cannot be selected, then the pathway selected does not support monitored release assessment.

14. IF pathway is from the RB Stack, TB Exhaust or RW Exhaust,
THEN SELECT Monitored TAB top center.

NOTE:

- If release is from the Reactor Building Stack, you may use Stack Comp (Rad Stat) or Composite (Containment Status) if available; select Monitor based upon value as shown below:
 - PRM-RE-11 (low) if radiation level is LE 1E-2 $\mu\text{Ci/cc}$
 - PRM-RE-12 (mid) if radiation level is GT 1E-2 thru LE 1E1 $\mu\text{Ci/cc}$
 - PRM-RE-13 (hi) if radiation level is GT 1E1 $\mu\text{Ci/cc}$
 - Stack Door Monitor (if in service as compensatory measure)
- If release is from the Turbine Building Exhaust, use the COMP reading
- If release is from the Radwaste Building Exhaust, use the COMP reading

15. **SELECT** a monitor that has valid and on-scale data for selected pathway.
16. **ENTER** the Monitor reading for the selected monitor.
17. **ENTER** the Release Point Flow Rate. (If SBTG is running and Reactor Building Exhaust Fans are shutdown; use the total of the running SBTG train flowrates.)
18. **SELECT** the 10 miles or 50 miles Process Assessment button. – A green progress bar will be displayed. Typical calculation times will be less than 20 seconds.
- Results for dose assessment by distance will be displayed.
19. **SELECT** "View the Evacuation Area Graphic" (GLOBE) icon below "Monitored" TAB for PAR graphic.
20. To perform an update or different calculation,
CHANGE any or all input values as needed and
SELECT the Process Assessment button again. If only changing one field, it may be necessary to click out of that field to get the Process Assessment button to appear.
21. **SELECT** Print Preview Options (magnifying glass icon directly below the "Monitored" TAB) to view the Dose Assessment report. The Receptor Point Report is not used at CGS.
22. Either **SELECT** the "Printer" to print or **SELECT** "Close" to return to the main screen.
23. IF printing is desired from the main screen,
THEN SELECT Print Options (printer icon directly below the "Monitored" TAB) to print out a copy of the Dose Assessment report.
24. **COMPARE** URI output at 1.2 miles for EALs per PPM 13.1.1 and for potential protective action recommendations.
25. Shift Manager, RPM or REM **SIGNS** printed data for distribution.
26. **FORWARD** to the Emergency Director for approval prior to releasing data for distribution.