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13.8.1	036/001
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		Date	
Number: 13.8.1	Use Category: REFERENCE	Major Rev: 036	
Title: Emergency Dose Projection System Operations		Minor Rev: 001	
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PLANT PROCEDURES MANUAL	PCN#: N/A
 13.8.1	Effective Date: 05/24/17

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DESCRIPTION OF CHANGES

Justification (required for major revision)
<p>Response to AR 336847 and 343698 to include dose assessment alternate methods.</p> <p>Response to AR 344712 to update SDM readings</p> <p>Incorporate lessons learned from URI users</p>

Page(s)	Description (including summary, reason, initiating document, if applicable)
8	Added step 4.1.11 to provide guidance for containment venting (lesson learned)
9, 11	Added "EAL Chart" to statement for clarification (editorial change) Added Met primary/backup explanation
9,11,18, 22, 23	Added statement to use SGT flowrate when SGT is running (lessons learned)
14	Added Reference 5.1.13
15	Revised titles of Attachment 7.3, 7.5 and 7.6, added Attachment 7.7
11, 16, 19	Added clarifying statements about when to use "Normal Coolant", "Fuel Clad Damage" and "Spiking Factor". (enhancement)
18, 22, 23	Added statement concerning alternate methods for determining building exhaust flows per AR 336847
26	Clarified use of CGS delta "T" for URI (lessons learned), MR 001 added Operator Aid required update if change table to note. AR 347508
29	Update Stack Door Monitor readings per AR 344712
31	Added Attachment 7.7, Alternate Methods for ARMs or OG-RIS-612 per AR 336847
17,20	Minor Rev 001 Shutdown date for spent fuel has been updated for Refuel Outage R23. AR 364926

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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-1594}

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

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

2.11 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.

2.12 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 Stack Monitors (PRM-RE-1B and/or PRM-RE-1C) are 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.

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

2.14 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.

3.0 RESPONSIBILITIES

3.1 STA / Incident Advisor

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

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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 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.
- 4.1.2 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).
 - 3) Radiation monitor, effluent monitor, SDM, and meteorological data are also available through other 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.).

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- 4.1.3 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.
- 4.1.4 Start URI by double-clicking on the appropriate icon on the Desktop or start from the "C" drive.
- 4.1.5 If necessary, refer to Attachment 7.1, URI User Guidance, which provides detailed guidance on using URI.
- 4.1.6 Review dose projection printouts, note any qualifying factors as appropriate and brief the RPM or REM on the dose projection.
- 4.1.7 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.
- 4.1.8 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.
 - c. Air Sample Calculator in URI Detailed assessment (preferred)
 - 1) See Attachment 7.1 for details on Air Sample Calculator use.

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

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- 4.1.9 Provide the Emergency Worker Dose Adjustment Factor to the REM and Field Team Coordinator for their use in establishing field team exposure limits.
- If the Dose Adjustment Factor is 5 or greater, use Dose Adjustment Factor of 5.
 - 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 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)

- If the EDE/TEDE ratio is less than or equal to 0.2, use a Dose Adjustment Factor of 5.
- 4.1.10 If any of the TEDE or CDE values are greater than or equal to the levels in the below table on a release, the ED should refer to PPM 13.1.1 for the appropriate classification.

To obtain mrem/hr for UE or Alerts, divide TEDE or CDE by the release duration.

Duration/Classification	UE TEDE	UE CDE	Alert TEDE	Alert CDE
3 hours	GE 0.3 mrem	GE 0.9 mrem	GE 30 mrem	GE 150 mrem
4 hours	GE 0.4 mrem	GE 1.2 mrem	GE 40 mrem	GE 200 mrem
5 hours	GE 0.5 mrem	GE 1.5 mrem	GE 50 mrem	GE 250 mrem

- 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.

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- 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.
 - 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 (PPM 13.1.1 Table 4) 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 The following steps will provide guidance on performing a Detailed 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. If in Rapid URI, you must close rapid URI to get to Detailed.
- a. Start URI with icon (software on "C" drive if icon missing)
 - b. If not a real event then select "This is a drill"
 - c. Select Detailed Assessment – CLOUD icon top left of startup page
 - d. Select fuel condition – Normal Coolant or Reactor Core Accident or Spent Fuel Accident. If Normal Coolant is selected, select Spiking Factor if Reactor Bldg process radiation monitors spike following a plant transient.
 - e. If Reactor Core Accident – select core condition; CLAD (PPM 13.1.1 Table 3 Effluent Monitor reading is GT UE value) or MELT (SAGs entered)
 - f. If Spent Fuel Accident, specify age based on last refueling outage shutdown
 - g. Selecting 'Spent Fuel Accident' changes the 'Reactor Shutdown' date/time to 'last irradiated/time and sets a default irradiation date/time, which does not necessarily correspond to last refueling outage shutdown
 - h. Select CGS 33ft Tower unless data is not available (Channel A primary, Channel B backup), then select FFTF #9
 - i. Enter Met data
 - j. If reactor power is LE 1% (shutdown), select box for Reactor Shutdown
 - k. Verify shutdown date / time – change if needed
 - l. Enter Release Duration – for ongoing release round up to next hour and add two
 - m. Double click yellow Pathway bar to show pathways selection screen
 - n. Select best matching pathway
 - o. 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
 - p. If pathway is through SGT, **change Rx Bldg HUT to 2-24 Hours.** Factor groupings that are grey do not apply to the selected pathway
 - q. Select "Accept" on the pathways page
 - r. Select Monitored Release TAB center top.

NOTE: if TAB cannot be selected, then the pathway selected does not support monitored release assessment. Select a monitor that has valid and on-scale data for selected pathway
 - s. Enter the Monitor reading for the selected monitor

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- t. 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.
- u. 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.
- v. Results for dose assessment by distance will be displayed.
- w. Select "View the Evacuation Area Graphic" (GLOBE) icon below "Monitored" TAB for PAR graphic.

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.

- 4.3.2 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.
- 4.3.3 Select Print Options (printer icon directly below the "Monitored" TAB) to print out a copy of the Dose Assessment report.
- 4.3.4 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.
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- 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.

4.3.8 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 10 CFR 50 .47(b) Planning Standard {R1594}
- 5.1.2 10 CFR 50, Appendix E, Emergency Plan
- 5.1.3 GI2-03-020, Elimination of Requirements for Post-Accident Sampling System {C-11714}
- 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 {R-4059}
- 5.1.5 NUREG 1228, Source Term Estimation During Incident Response to Severe Nuclear Power Plant Accidents
- 5.1.6 AED CAL NE-02-12-05, Calculation for Alternate Post-Accident Radiation Monitor At Elevated Release Stack Access Door
- 5.1.7 RSCS TSD-13-035 (CVI 1057-00,131) TEA and WEA replacement
- 5.1.8 NE-02-09-12 Table 3 (CMR 10715)
- 5.1.9 NE-02-10-05 URI
- 5.1.10 FW-SOFT-COTS-RASCAL and FW-SOFT-COTS-URI
- 5.1.11 CR 244578, CMR changed EAL classification value without adequate 50.54q
- 5.1.12 SQA SDD SDD-PDIS-01, Plant Data Information System Software Design Description
- 5.1.13 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-RE-1B and PRM-RE-1C

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

7.7 Alternate Method for ARM or OG-RIS-612

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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 UE value), 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 Bldg process radiation monitors spike following a plant transient; otherwise select "No".
 - c. Check the "Reactor Shutdown" box if appropriate and enter date of shutdown using the pull down calendar. Overwrite the indicated time as necessary.

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- d. Select Damaged Spent Fuel Assembly for any spent fuel 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 5/13/17. (CGS does not have the ability to update software.) {AR 323710}

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. {R-4059}

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 four 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 Bldg 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-7, the stack monitors will be out of service, 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.

- 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 (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. {AR 336847}
 - 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 GT UE value). Select Spiking Factor if Reactor Bldg 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. {R-4059}

- 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 Damaged Spent Fuel Assembly for any spent fuel 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 5/13/17. (CGS does not have the ability to update software.) {AR 323710}

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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 Bldg 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-7, the stack monitors will be out of service, 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.

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
 - 2) Monitor: Select the radiation monitor you wish to use or select the building as appropriate.

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- 3) Release Point Flow Rate: Input real time data from plant computer system/instrument readings. Range for RB and RW bldgs. is GE 0 to LE 2E6 CFM, TB bldg 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. {AR 336847}
- 4) Monitor Reading: Input real time data from plant computer system or instrument readings. Ensure units match those in the program. Range is GE 0 to LE 1E6 CPS for Stack Monitors, GE 0 to LE 1E3 uCi/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. {AR 336847}
 - 2) Isotope Box range is GE 0 to 1E4 uCi/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. (uCi/cc) range 1E-11 to 1E11 uCi/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

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: {R-4059}

- 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.

- PNNL 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 PNNL 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	$\Delta T > 4.7$

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- 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

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Computer Points Used In The eDNA View Radiological Status Screen

Radiological Status				ENW.CGS.TIMET					
<table border="1"> <tr> <td align="center" colspan="2">Reactor Power</td> <td align="center" colspan="2">Q012 %</td> </tr> </table>						Reactor Power		Q012 %	
Reactor Power		Q012 %							
Delta T Stability Class Wind Velocity Wind Direction From		Met. Channel A META69 deg F META70 Q224A META58 mph META60 deg Az		Met. Channel B METB69 deg F METB70 Q224B METB58 mph METB60 deg Az					
Rx Exh Stack Lo Stack Int Stack Hi Plnm A Plnm C Cntmt E Cntmt F DW Press DW Temp FDR Sump EDR Sump SGTS A1 SGTS A2 SGTS B1 SGTS B2	X213 cfm X406 cps X407 cps Q027 cps X079 mR/hr X094 mR/hr X432 R/hr X399 R/hr Q022 psig Q047 deg F Q041 gpm Q039 gpm X466 cfm X462 cfm X356 cfm X371 cfm	ARM19 Main CR W 1 606 Fuel Pool E*34 606 D/SEP N 8 572 SGTS S 6 572 ROA E 4 572 CRD W 5 572 CRD NW*33 501 Entry NE 7 501 TIP NE*32 471 Elev#1 W 24 471 Valve W 9 422 RHR-A W 10 422 RHR-B N 11 422 RHR-C S 23 422 CRD N 12 422 RCIC E 13 422 HPCS	Q092 mR/hr Q093 mR/hr Q095 R/hr Q086 mR/hr Q096 mR/hr Q094 mR/hr Q095 mR/hr Q084 R/hr Q097 mR/hr Q083 R/hr Q099 mR/hr Q087 mR/hr Q088 mR/hr Q089 mR/hr Q098 mR/hr Q090 mR/hr Q091 mR/hr	TG Exh NG Low NG Mid RW Exh NG Low NG Mid Cntmt NG 1 Part 2 NG 2 Part Treatment Pre-Treat Post-Treat	X198 cfm X409 cpm X394 pmu X366 cfm X408 cpm X393 pmu X469 uCi/cc X470 uCi/cc X398 uCi/cc X413 uCi/cc X073 mR/hr X088 uCi/cc				

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Alternate Method for PRM-RE-1B and PRM-RE-1C

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 monitors PRM-RE-1B and PRM-RE-1C are unavailable. The radiation level readings (in mR/hr) from this Stack Door Monitor (SDM) can be converted to an equivalent PRM-RE-1B (RB Stack Intermediate Range) or PRM-RE-1C (RB Stack High Range) reading (in cps) that 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-02-12-05. The use of the table may be used for Table 3 equivalency if needed.

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 (cps)	Action Notes (based on filtered releases)
8	6000 (B)	PPM 13.1.1 Table 3 Unusual Event EAL threshold*
12,100	400 (C)	PPM 13.1.1 Table 3 Alert EAL threshold*
1.14E5	2,000 (C)	PPM 13.1.1 Table 3 Site Area Emergency EAL threshold*
1.14E6	20,000 (C)	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-4 thru 18, ARM-RIS-20 thru 30, 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, in accordance with ODCM 6.1.2.1.

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, in accordance with ODCM 6.1.2.1.
- 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

Verify Revision Information Prior To Use	Initials	
	Date	

Number: 13.11.12	Use Category: REFERENCE	Major Rev: 031
Title: EOF ENGINEERING MANAGER AND STAFF DUTIES		Minor Rev: N/A
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PLANT PROCEDURES MANUAL	PCN#: N/A
 13.11.12	Effective Date 05/24/17

Number: 13.11.12	Use Category: REFERENCE	Major Rev: 031
Title: EOF ENGINEERING MANAGER AND STAFF DUTIES		Minor Rev: N/A
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DESCRIPTION OF CHANGES

Justification (required for major revision)
Updated procedure to current format and removed references to "INPO Nuclear Network information bulletins" as they are no longer in use. Removed Attachment 7.1.

Page(s)	Description (including summary, reason, initiating document, if applicable)
5	Section 3.5, removed reference to INPO Nuclear Network information bulletins
6	Editorial: Added "Commitment" to References 5.1.2 and 5.1.3 and removed the French brackets with the obsolete RTS number, not located anywhere else in the document.
7	Section 7, removed reference to Attachment 7.1, this attachment is no longer needed
8	Removed Attachment 7.1

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1.0 PURPOSE

This procedure provides instructions and guidance for activities of the EOF Engineering Manager and staff during an emergency.

2.0 DISCUSSION

None

3.0 RESPONSIBILITIES

3.1 All ERO Members

- 3.1.1 Perform position turnover for protracted events
- 3.1.2 Respond as directed when notified of a declared event
- 3.1.3 Maintain personal event logs and records in support of the after action report
- 3.1.4 Restore area and materials upon event termination
- 3.1.5 Apply fundamental ERO knowledge in the performance of your ERO duties
- 3.1.6 Properly use ERO procedures and checklists in the performance of your ERO duties
- 3.1.7 Acquire & maintain qualification in your assigned ERO position
- 3.1.8 Apply human performance error reduction techniques in the performance of your ERO duties

3.2 EOF Engineering Manager

- 3.2.1 Manage the technical assessment and monitoring group in the EOF
- 3.2.2 Perform accident assessment in support of event determination and mitigation actions
- 3.2.3 Coordinate outside engineering support
- 3.2.4 Provide input for facility briefs and updates

3.3 State / County Technical Liaison

- 3.3.1 Monitor plant conditions and event response activities
- 3.3.2 Provide information updates to and addresses questions and support requests from the EOC representatives

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3.4 Energy Northwest Representatives to State / County EOCs

3.4.1 Provide technical support and information to state and county EOCs

3.4.2 Communicate state and county actions and decisions to the EOF

3.5 INPO Network Coordinator

Prepare and provide event information to INPO.

3.6 EOF PDIS Analyst

3.6.1 Activate ERDS

3.6.2 Display and monitor the PDIS data

3.7 Radiation Detection Systems Engineer

3.7.1 Display and monitor the radiation monitoring system status for input used in dose assessment and in-plant radiological conditions

3.7.2 Assist the Radiation Emergency Manager (REM) in briefing outside responders to the EOF on radiological conditions

4.0 PROCEDURE

4.1 EOF Engineering Manager

Perform appropriate actions using guidance in form 26538, EOF Engineering Manager Checklist, upon declaration of an emergency.

4.2 State / County Technical Liaison

Perform appropriate actions using guidance in form 26541, State / County Technical Liaison Checklist, upon declaration of an emergency.

4.3 Energy Northwest Representatives to State / County EOCs

Perform appropriate actions using guidance in form 26551, Energy Northwest Representatives to State / County EOCs Checklist, upon declaration of an emergency.

4.4 INPO Network Coordinator

Perform appropriate actions using guidance in form 26545, INPO Network Coordinator Checklist, upon declaration of an emergency.

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4.5 EOF PDIS Analyst

Perform appropriate actions using guidance in form 26540, Computer System PDIS Analyst Checklist, upon declaration of an emergency.

4.6 Radiation Detection Systems Engineer

Perform appropriate actions using guidance in form 26539, Radiation Detection Systems Engineer Checklist, upon declaration of an emergency.

5.0 REFERENCES

5.1 Regulatory / Licensing Documents

5.1.1 FSAR, Chapter 13.3, Emergency Plan, Sections 2, 3, and 6

5.1.2 Commitment, 10CFR50, Appendix E (VI), Emergency Response Data System (ERDS)

5.1.3 Commitment, 10CFR50.72, Immediate Notification Requirements for Operating Power Reactors

5.2 Procedures

5.2.1 PPM 13.2.2, Determining Protective Action Recommendations

5.2.2 PPM 13.13.2, Emergency Event Termination and Recovery Operations

5.2.3 PPM 13.13.4, After Action Reporting

5.3 Forms

5.3.1 EOF Engineering Manager Checklist, Form 26538

5.3.2 State / County Technical Checklist, Form 26541

5.3.3 Energy Northwest Representative to State / County EOCs Checklist, Form 26551

5.3.4 INPO Network Coordinator Checklist, Form 26545

5.3.5 EOF PDIS Analyst Checklist, Form 26540

5.3.6 Radiation Detection Systems Engineer Checklist, Form 26539

5.3.7 Emergency Response Log, Form 23895

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5.4 Correspondence / Other

5.4.1 OER SIL324R6, BWR Emergency Support Program

5.4.2 Work Release Order C-0875

5.4.3 Plant Data Information System (PDIS) Users Manual

5.4.4 Tech Memo 2117, Core Thermal or Reactor Engineer

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.

7.0 ATTACHMENTS

None