



Benjamin C. Waldrep  
526 South Church Street  
Charlotte, NC 28202

Mailing Address:  
Mail Code EC07H / P.O. Box 1006  
Charlotte, NC 28201-1006

704-382-8162

704-382-4541 fax

10 CFR 50.4(b)(5)(iii)  
10 CFR 50.54(q)(5)  
10 CFR 50, Appendix E, Section V

Serial: RA-13-019  
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U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
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BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-325 AND 50-324 / RENEWED LICENSE NOS. DPR-71 AND DPR-62

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT  
DOCKET NO. 50-302 / LICENSE NO. DPR-72

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1  
DOCKET NO. 50-400 / RENEWED LICENSE NO. NPF-63

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261 / RENEWED LICENSE NO. DPR-23

**SUBJECT: TRANSMITTAL OF EMERGENCY PLAN IMPLEMENTING PROCEDURES  
EMG-NGGC-0002, REVISIONS 5 AND 6, EMG-NGGC-0004, REVISIONS 3  
AND 4 AND EMG-NGGC-0005, REVISIONS 3 AND 4**

Ladies and Gentlemen:

In accordance with 10 CFR 50.4(b)(5)(iii), 10 CFR 50.54(q)(5) and 10 CFR 50, Appendix E, Section V, Duke Energy Progress, formerly known as Carolina Power & Light Company (CP&L) and Duke Energy Florida, formerly known as Florida Power Corporation (FPC) are transmitting revised fleet Emergency Plan Implementing Procedures, EMG-NGGC-0002, *Off-site Dose Assessment*, Revisions 5 and 6, EMG-NGGC-0004, *Maintenance of the Emergency Response Organization Notification System*, Revisions 3 and 4 and EMG-NGGC-0005, *Activation of the Emergency Response Organization Notification System*, Revisions 3 and 4. The effective date of EMG-NGGC-0002, Revision 5, EMG-NGGC-0004, Revision 3 and EMG-NGGC-0005, Revision 3 was July 24, 2013. The effective date of EMG-NGGC-0002, Revision 6, EMG-NGGC-0004, Revision 4 and EMG-NGGC-0005, Revision 4 was August 22, 2013. Both the July 24, 2013 and August 22, 2013 revisions have been evaluated in accordance with 10 CFR 50.54(q) and determined not to reduce the effectiveness of the Radiological Emergency Response Plans (Emergency Plans) for the facilities listed above and that the Plans, as changed, continue to meet the standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E.

Enclosures 1a, 1b and 1c provide 10 CFR 50.54(q)(5) analysis summaries for the July 24, 2013 and August 22, 2013 revisions. Enclosures 2a, 2b, 2c, 2d, 2e and 2f provide copies of both the July 24, 2013 and August 22, 2013 revisions.

AX45  
NR

No new commitments have been made in this submittal. If you have additional questions, please call Mike Austin at 980-373-4134.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ben C. Waldrep', with a large, stylized loop at the end.

Benjamin C. Waldrep  
Vice President – Corporate Governance &  
Operations Support

- c: USNRC – Region I
- USNRC – Region II
- USNRC Resident Inspector – BSEP, Unit Nos. 1 and 2
- USNRC Resident Inspector – CR3
- USNRC Resident Inspector – SHNPP, Unit No. 1
- USNRC Resident Inspector – HBRSEP, Unit No. 2
- C. Gratton, NRR Project Manager – BSEP, Unit Nos. 1 and 2; CR3
- A. Hon, NRR Project Manager – SHNPP, Unit No. 1
- S. Lingam, NRR Project Manager – HBRSEP, Unit No. 2

United States Nuclear Regulatory Commission

RA-13-019

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bc: (w/o Enclosure)

Chris Nolan

Julie Olivier

Mike Austin

Kent Crocker

Tony Pilo

Gregg Simmons

Carl Bergstrom

Dave Corlett

Richard Hightower

Lee Grzeck

Daniel Westcott

(w/ Enclosure)

Christine Caudell (For RNP Licensing/Nuclear Records Files)

Frieda Frando (For CR3 Licensing/Nuclear Records Files)

Mike Wallace (For HNP Licensing/Nuclear Records Files)

Bill Murray (For BNP Licensing/Nuclear Records Files)

File: (Corporate)



**Enclosure 1a**

**10 CFR 50.54(q)(5) Analysis Summary for EMG-NGGC-0002, Rev. 5 and 6**

**Brunswick Steam Electric Plant, Unit Nos. 1 and 2  
Docket Nos. 50-325 and 50-324 / Renewed License Nos. DPR-71 and DPR-62**

**Crystal River Unit 3 Nuclear Generating Plant  
Docket No. 50-302 / License No. DPR-72**

**Shearon Harris Nuclear Power Plant, Unit No. 1  
Docket No. 50-400 / Renewed License No. NPF-63**

**H. B. Robinson Steam Electric Plant, Unit No. 2  
Docket No. 50-261 / Renewed License No. DPR-23**

### **10 CFR 50.54(q)(5) Analysis Summary for EMG-NGGC-0002, Rev. 5 and 6**

In accordance with 10 CFR 50.54(q)(5), Duke Energy Progress and Duke Energy Florida are providing an analysis summary for the revised Fleet Emergency Plan Implementing Procedure EMG-NGGC-0002, *Off-site Dose Assessment, Revisions 5 and 6*. The analysis summary for changes associated with program elements, administrative changes, and editorial corrections is described below. Specific procedure changes associated with Revision 5 are included on page 87 of the attached document (Enclosure 2a) and changes associated with Revision 6 are included on page 88 of the attached document (Enclosure 2b).

#### **EMG-NGGC-0002, Revision 5, Change Justifications**

- (1) This revision removes directions in the fleet procedures to access the dose assessment program (RASCAL) as an editorial revision. By removing the software path to access RASCAL, this change could affect the timeliness of performing a Dose Projection, however, not beyond the times currently established in the Emergency Plan. This change continues to comply with planning standards, as described in 10 CFR 50.47(b) and NRC requirements, as described in 10 CFR 50, Appendix E.

#### **EMG-NGGC-0002, Revision 6, Change Justifications**

- (1) This revision adds clarification to Step 3.5.2 of Attachment 8. The step was changed from "SELECT mettower." to "SELECT mettower from the Windows Start Bar."
- (2) This revision restores deleted steps from the previous revision to locate the dose assessment program RASCAL. Duke Energy is in the process of transitioning from the Windows XP operating system to Windows 7 operating system and will begin using the Duke Energy Applications Environment to access programs. As a result of this change, the procedural direction in the corporate fleet procedures to access RASCAL was removed from EMG-NGGC-0002 as an editorial revision. This revision restores the original instructions for Windows XP as well as adds instructions for the Windows 7 pathways to access RASCAL. This change continues to comply with planning standards, as described in 10 CFR 50.47(b) and NRC requirements, as described in 10 CFR 50, Appendix E.

#### **Evaluation Conclusion**

The changes in Revisions 5 and 6 of EMG-NGGC-0002 do not reduce the effectiveness of the Emergency Plans for Brunswick Steam Electric Plant Unit Nos. 1 and 2, Crystal River Unit 3 Nuclear Generating Plant, Harris Nuclear Plant, Unit No. 1, or H.B. Robinson Steam Electric Plant Unit No. 2 and continue to meet NRC requirements, as described in 10 CFR 50.47(b) and 10 CFR 50, Appendix E. These changes do not impact the current Emergency Action Level schemes.

**Enclosure 1b**

**10 CFR 50.54(q)(5) Analysis Summary for EMG-NGGC-0004, Rev. 3 and 4**

**Brunswick Steam Electric Plant, Unit Nos. 1 and 2  
Docket Nos. 50-325 and 50-324 / Renewed License Nos. DPR-71 and DPR-62**

**Crystal River Unit 3 Nuclear Generating Plant  
Docket No. 50-302 / License No. DPR-72**

**Shearon Harris Nuclear Power Plant, Unit No. 1  
Docket No. 50-400 / Renewed License No. NPF-63**

**H. B. Robinson Steam Electric Plant, Unit No. 2  
Docket No. 50-261 / Renewed License No. DPR-23**

### **10 CFR 50.54(q)(5) Analysis Summary for EMG-NGGC-0004, Rev. 3 and 4**

In accordance with 10 CFR 50.54(q)(5), Duke Energy Progress and Duke Energy Florida are providing an analysis summary for the revised Fleet Emergency Plan Implementing Procedure EMG-NGGC-0004, *Maintenance of the Emergency Response Organization Notification System, Revisions 3 and 4*. The analysis summary for changes associated with program elements, administrative changes, and editorial corrections is described below. Specific procedure changes associated with Revision 3 are included on page 21 of the attached document (Enclosure 2c) and specific changes associated with Revision 4 are included on page 22 of the attached document (Enclosure 2d).

#### **EMG-NGGC-0004, Revision 3, Change Justifications**

- (1) This revision removes directions in the fleet procedure to access the Emergency Response Organization Notification System (EverBridge) as an editorial revision. This change continues to comply with planning standards, as described in 10 CFR 50.47(b) and NRC requirements, as described in 10 CFR 50, Appendix E.

#### **EMG-NGGC-0004, Revision 4, Change Justifications**

- (1) This revision restores deleted steps from the previous revision to locate the Emergency Response Organization Notification System (EverBridge). Duke Energy is in the process of transitioning from the Windows XP operating system to Windows 7 operating system and will begin using the Duke Energy Applications Environment to access programs. As a result of this change, the procedural direction in the corporate fleet procedures to access EverBridge was removed from EMG-NGGC-0004 as an editorial revision. Revision 4 of EMG-NGGC-0004 restores the original instructions for Windows XP as well as adds instructions for the Windows 7 pathways to access EverBridge. This change continues to comply with planning standards, as described in 10 CFR 50.47(b) and NRC requirements, as described in 10 CFR 50, Appendix E.

#### **Evaluation Conclusion**

The changes included in Revisions 3 and 4 of EMG-NGGC-0004 do not reduce the effectiveness of the Emergency Plans for Brunswick Steam Electric Plant Unit Nos. 1 and 2, Crystal River Unit 3 Nuclear Generating Plant, Harris Nuclear Plant, Unit No. 1, or H.B. Robinson Steam Electric Plant Unit No. 2 and continue to meet NRC requirements, as described in 10 CFR 50.47(b) and 10 CFR 50, Appendix E. These changes do not impact the current Emergency Action Level schemes.

**Enclosure 1c**

**10 CFR 50.54(q)(5) Analysis Summary for EMG-NGGC-0005, Rev. 3 and 4**

**Brunswick Steam Electric Plant, Unit Nos. 1 and 2  
Docket Nos. 50-325 and 50-324 / Renewed License Nos. DPR-71 and DPR-62**

**Crystal River Unit 3 Nuclear Generating Plant  
Docket No. 50-302 / License No. DPR-72**

**Shearon Harris Nuclear Power Plant, Unit No. 1  
Docket No. 50-400 / Renewed License No. NPF-63**

**H. B. Robinson Steam Electric Plant, Unit No. 2  
Docket No. 50-261 / Renewed License No. DPR-23**

### **10 CFR 50.54(q)(5) Analysis Summary for EMG-NGGC-0005, Rev. 3 and 4**

In accordance with 10 CFR 50.54(q)(5), Duke Energy Progress and Duke Energy Florida are providing an analysis summary for the revised Fleet Emergency Plan Implementing Procedure EMG-NGGC-0005, *Activation of the Emergency Response Organization Notification System, Revisions 3 and 4*. The analysis summary for changes associated with program elements, administrative changes, and editorial corrections is described below. Specific procedure changes associated with Revision 3 are included on page 27 of the attached document (Enclosure 2e) and specific changes associated with Revision 4 are included on page 27 of the attached document (Enclosure 2f).

#### **EMG-NGGC-0005, Revision 3, Change Justifications**

- (1) This revision removes directions in the fleet procedures to access the Emergency Response Organization Notification System (EverBridge) as an editorial revision. This change continues to comply with planning standards, as described in 10 CFR 50.47(b) and NRC requirements, as described in 10 CFR 50, Appendix E.

#### **EMG-NGGC-0005, Revision 4, Change Justifications**

- (1) This revision restores deleted steps from the previous revision to locate the Emergency Response Organization Notification System (EverBridge). Duke Energy is in the process of transitioning from the Windows XP operating system to Windows 7 operating system and will begin using the Duke Energy Applications Environment to access programs. As a result of this change, the procedural direction in the corporate fleet procedures to access EverBridge was removed from EMG-NGGC-0005 as an editorial revision. Revision 4 of EMG-NGGC-0005 restores the original instructions for Windows XP as well as adds instructions for the Windows 7 pathways to access EverBridge. This change continues to comply with planning standards, as described in 10 CFR 50.47(b) and NRC requirements, as described in 10 CFR 50, Appendix E.

#### **Evaluation Conclusion**

The changes included in Revisions 3 and 4 of EMG-NGGC-0005 do not reduce the effectiveness of the Emergency Plans for Brunswick Steam Electric Plant Unit Nos. 1 and 2, Crystal River Unit 3 Nuclear Generating Plant, Harris Nuclear Plant, Unit No. 1, or H.B. Robinson Steam Electric Plant Unit No. 2 and continue to meet NRC requirements, as described in 10 CFR 50.47(b) and 10 CFR 50, Appendix E. These changes do not impact the current Emergency Action Level schemes.

**Enclosure 2a**  
**EMG-NGGC-0002,**  
***Off-site Dose Assessment,***  
**Revision 5**

NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

**EMG-NGGC-0002**

***OFF-SITE DOSE ASSESSMENT***

REVISION 5





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## **1.0 PURPOSE**

- 1.1** The purpose of this procedure is to provide Nuclear Generation Group (NGG) guidance for performing offsite radiological dose assessments from the Technical Support Center or Emergency Operations Facility. This procedure is not for offsite dose assessment by on-shift Control Room Staff.
- 1.2** This procedure is to be used in conjunction with Radiological Assessment System for Consequence Analysis (RASCAL) Version 3.0.5 software during a declared plant emergency involving a release or potential release of airborne radioactive materials to the environment. This procedure should be used for all RASCAL Source Term Options except for Monitored Releases – Mixtures. For monitored releases, the use of RASCAL is described in site procedures as listed in References 2.2.7 through 2.2.10.
- 1.3** This procedure describes an adequate method for assessing actual or potential offsite consequences of a radiological emergency condition as delineated in 10CFR50.47(b)(9).
- 1.4** This procedure is an emergency plan implementing procedure. Any revisions must be carefully considered for emergency plan impact.

## **2.0 REFERENCES**

### **2.1 Developmental**

- 2.1.1** EPA 400 R-92-001, Manual of Protective Action Guides and Protective Actions For Nuclear Incidents
- 2.1.2** NUREG/BR-0150, Volume 1, Revision 4, RTM-96 Response Technical Manual
- 2.1.3** U.S. Department of Health, Education, and Welfare, Radiological Health Handbook, 1970
- 2.1.4** Crystal River NOCS 00387, Method for Transmitting and Radiological Data to the TSC and EOF
- 2.1.5** Crystal River NOCS 40188, Instructions for Accessing Meteorological and Radiological Data to the TSC and EOF
- 2.1.6** R-RP-11-01-F1F - Radiation Protection and Emergency Preparedness personnel have not effectively implemented actions to improve accuracy or timeliness of emergency plan dose projections (NCR 481263)

## **2.2 Implementing**

2.2.1 NUREG-1887, RASCAL 3.0.5: Description of Models and Methods

2.2.2 NUREG-1889, RASCAL 3.0.5 Workbook

2.2.3 Crystal River Nuclear Plant Final Safety Analysis Report (FSAR)

2.2.4 CR-3, Radiological Emergency Response Plan (RERP)

2.2.5 Harris Nuclear Plant FSAR Table 9.4.0-2

2.2.6 Crystal River Engineering Evaluation EEF-00-009, Revision 1 – Radiation Monitor Response Factors

2.2.7 EPRAD-03, H.B. Robinson Steam Electric Plant Dose Projections

2.2.8 PEP-344, HNP Offsite Dose Assessment Based on Monitored Releases

2.2.9 EM-204B, Offsite Dose Assessment During Radiological Emergencies for Monitored Releases – Mixtures (CR3)

2.2.10 OPEP-03.4.8, Brunswick Nuclear Plant Offsite Dose Estimates Based on Monitored Releases

2.2.11 CSP-NGGC-2505, Software Quality Assurance and Configuration Control of Business Computer Systems

## **3.0 DEFINITIONS**

### **3.1 Adverse Met Data**

The worst case meteorological conditions: G stability class and wind speed of 1.0 mph.

### **3.2 Committed Dose Equivalent**

Dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

### **3.3 Committed Effective Dose Equivalent**

Sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues.

### **3.0 DEFINITONS (continued)**

#### **3.4 Core Melt**

Deformation of fuel pellet configuration due to excessive core temperature releasing large quantities of gaseous and particulate fission products.

#### **3.5 Decay Calculator**

The Decay Calculator (DecayCalc) computes radiological decay and daughter ingrowth. It computes the activity remaining after the decay time selected. It includes access to the RASCAL radionuclide database and has the ability to display decay chains as a table or as a graphic. DecayCalc is not linked to any other RASCAL module. Decay calculations are available within the STDose and FMDose models when appropriate. The same decay data and decay calculation routines are used throughout RASCAL.

#### **3.6 Deep Dose Equivalent**

External whole-body exposure at a tissue depth of 1 cm (1000 mg/cm<sup>2</sup>).

#### **3.7 Delta T**

Measurement of the difference in air temperature between two different elevations above ground level. The value provides a measure of the atmospheric stability.

#### **3.8 Depletion**

Reduction of the concentration of the plume (i.e., deposition and dispersion).

#### **3.9 Deposition**

Means of puff depletion that deposits particulate radioactive material on the ground.

#### **3.10 Derived Intervention Level (DIL)**

A value that corresponds to a health effect threshold or Protective Action Guideline (PAG). A DIL can be used to relate environmental measurements or laboratory analyses to the potential for health affects or the need for protective actions.

#### **3.11 Dose Equivalent**

Product of the absorbed dose in rad, a quality factor related to the biological effectiveness of the radiation involved and any other modifying factors. Units are typically in rem.

### **3.0 DEFINITIONS (continued)**

#### **3.12 Early Phase**

The period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required and must be based primarily on predictions of radiological conditions in the environment. This phase may last from hours to days. For the purposes of dose projections, it is assumed to last four (4) days.

#### **3.13 Effective Dose Equivalent**

The sum of the products of the dose equivalent to each organ and a weighting factor, where the weighting factor is the ratio of the risk of mortality from delayed health effects arising from irradiation of a particular organ or tissue to the total risk of mortality from delayed health effects when the whole body is irradiated uniformly to the same dose. This unit in Rem is considered equivalent to the Deep Dose Equivalent for the purposes of dose projections because the external exposures are considered to be uniform across the whole body.

#### **3.14 Field Measurement to Dose – (FMDose)**

The FMDose model computes emergency worker limits and early-phase and intermediate-phase doses and derived intervention levels (DILs) from the analyses of field measurements. The results of the analysis of field measurements may be entered directly in FMDose. All results are presented as tables. The intermediate-phase DILs are also presented graphically. FMDose includes access to the RASCAL radionuclide database and has the ability to display decay chains as a table or as a graphic.

#### **3.15 Gas Gap Failure**

Degradation of the protective cladding around the fuel pellets due to elevated core temperature releasing only radionuclides contained in the space between pellet and the cladding.

#### **3.16 Ground Surface Correction Factor**

The ground surface correction factor is used in the calculation of ground-shine dose. Its value may be from 0.1 to 1.0. It is used to reduce the dose due to the effects of scattering off uneven ground.

### **3.0 DEFINITONS (continued)**

#### **3.17 Intermediate Phase**

The period beginning after the incident source and releases have been brought under control and reliable environmental measurements are available for use as a basis for decisions on additional protective actions and extending until these protective actions are terminated. This phase may overlap the early and late phases and may last from weeks to many months. For the purpose of dose projection, it is assumed to last for one year.

#### **3.18 Late Phase**

The period beginning when recovery action designed to reduce radiation levels in the environment to permanently acceptable levels are commenced, and ending when all recovery actions have been completed. This period may extend from months to years (also referred to as the recovery phase).

#### **3.19 Meteorological Data Processor**

STDose module used for entering meteorological data and preparing the data for use by the atmospheric transport and diffusion models in RASCAL. Meteorological data for the site (release point) and 35 additional meteorological observation points may be entered and processed for use by the STDose models. The model is generally accessed directly from the STDose user interface. This method is common when supporting an event using real-time meteorology. The program may also be run stand alone, directly from Windows. This mode of operation is common when building predefined data sets.

#### **3.20 Partitioning**

Reduction of non-noble gases when the steam generator tube leak is below the water level of the generator. This is highly unlikely at CR3 because most of the tube length in a once-through steam generator is above the secondary level. This is not applicable to BNP.

#### **3.21 Release Duration**

Period of time from the beginning of the release until the end of the release or the projected end of the release. This can be determined by estimating the completion of a damage control mission, performance of a repair to stop the release, or the estimated time until the RCS, Containment Vessel Sump or Steam Generator temperature is below 200<sup>0</sup> F for a pressurized water reactor.

### **3.0 DEFINITIONS (continued)**

#### **3.22 Resuspension Factor**

The resuspension factor is used to calculate air concentrations from ground surface measurements. Its value may be from  $1 \text{ E-11}$  to  $1 \text{ E-2}$ . It is used in all intermediate-phase calculations and in early-phase calculations when measured air concentrations are not used (that is, when "Use Air" is not checked on the Enter Field Data form).

#### **3.23 Seabreeze Effect**

Wind circulation system produced when the land temperature is higher than the ocean temperature causing a lower level wind direction from sea to land. The consequence of a release traveling to sea and returning back to land can impact the projected dose in an upward factor. For BNP the seabreeze effect, if confirmed by a meteorologist, can exist between the  $16^{\circ}$  and  $269^{\circ}$  bearings.

#### **3.24 Sigma-Theta**

Standard deviation of a set of wind range measurements. The value provides a measure of atmospheric stability. The CR3 Sigma-Theta meter automatically calculates and displays the standard deviation of wind range for the previous 15 minutes.

#### **3.25 Source Term to Dose (STDose)**

The STDose of RASCAL provides estimates of the integrated doses and consequences resulting from the accidental release of radionuclides to the atmosphere. The model requires only information that might be available during an emergency. STDose should be used to assess the consequences of potential or ongoing releases. The program is used in conjunction with the Meteorological Data Processor Program.

#### **3.26 Spike Factor**

Rapid decrease in pressure of the primary system causes an increase in the rate at which the radioactive fission products in the fuel rod cladding gap escape into the coolant. The RASCAL default spiking factor of 100 is recommended initially and then adjusted after primary coolant analysis. This is not necessarily an indication of fuel damage.

#### **3.27 Stability Class**

Lettering system from A to G to designate certain atmospheric conditions which affect the dispersion of the plume. Class A indicates rapid dispersion, less concentrated plume (unstable conditions). Class G indicates slow dispersion, more concentrated plume (stable conditions).



### **3.0 DEFINITONS (continued)**

#### **3.28 Total Effective Dose Equivalent (TEDE)**

Early or plume phase TEDE that RASCAL calculates is the sum of the external gamma dose (cloudshine) from the plume, the committed effective dose equivalent (CEDE), and the external dose over a four-day period from radionuclides deposited on the ground (4-day groundshine dose).

#### **3.29 Weathering Factor**

The fraction of radioactivity remaining after being affected by average weather conditions for a specified period of time.

### **4.0 RESPONSIBILITIES**

#### **4.1 Dose Assessment/Projection Coordinator or Team Leader**

- 4.1.1 Calculate the TEDE and the thyroid CDE, of off-site dose consequences from a release of radioactivity.
- 4.1.2 Report dose projection results to the Radiological Control Manager (RCM) or Radiation Control Coordinator (RCC) /Radiological Control Director (RCD) if the EOF is not activated in a timely manner.
- 4.1.3 Communicate periodically with State and other agency dose assessment representatives to compare and contrast cases and results that were generated. A comparison also provides a means of peer checking input data and assumptions.

#### **4.2 Dose Assessment Team**

- 4.2.1 Implement the steps of this procedure to generate dose projections for review by the Dose Assessment/Projection Coordinator or Team Leader.
- 4.2.2 Solicit input from Accident Assessment personnel as needed for plant conditions.

#### **4.3 Accident Assessment Team**

- 4.3.1 Inform the Dose Assessment Team of plant conditions that may impact a radiological release to the environment such as time of core uncovered, percent fuel damage, etc.

## **5.0 PREREQUISITES**

- 5.1** Personnel performing RASCAL dose assessment during an emergency, drill, or exercise are trained and qualified per station procedures.

## **6.0 PRECAUTIONS AND LIMITATIONS**

- 6.1** If the release pathway is monitored, then the RASCAL Source Term Option for Monitored Releases – Mixtures is the preferred dose projection method. This method requires the use of site specific information and therefore the use of RASCAL for monitored releases is provided in site specific procedures (References 2.2.7 – 2.2.10). Exit this procedure and use the appropriate site procedure.
- 6.2** RASCAL requires stability class to be entered as an alphabetic value (e.g., A, B, C...). OSI/PI and ERFIS report stability class as a numeric value (e.g., 1, 2, 3...). They convert directly, 1=A, 2=B, 3=C, etc.
- 6.3** Several different input models should be run when data permits due to inherent uncertainties associated with generating dose projections using RASCAL. For example, when grab sample release data is available for a stack release, projections may be made using both a release rate model and release concentration model.
- 6.4** The release duration should be based on available information. If release duration information is not known, then use a default value of 1 hour (RNP should use 2 hours). The dose projections should be modified as more accurate information becomes available.
- 6.5** Meteorological conditions should be monitored approximately every 15 minutes for changes and RASCAL dose projections updated accordingly.
- 6.6** RASCAL dose projections should be updated accordingly when new data becomes available for plant, meteorological or event conditions.
- 6.7** Dose projections saved for various source terms may be re-opened and modified as necessary. The re-opened case should be renamed as applicable based on changes to event type, source term, release path, etc.
- 6.8** Consider radiation monitor operability and status prior to use for dose projections.
- 6.9** Sea breeze affect is NOT a specific calculation option for RASCAL; however, the meteorological program will model sea breeze if additional meteorological weather stations are used. Failure to consider the effects of a sea breeze on plume projections could result in large errors in both the projected plume location and intensity. Sea breeze is not a factor for HNP or RNP.

## **6.0 PRECAUTIONS AND LIMITATIONS (continued)**

- 6.10** BNP verification of ERFIS data shall be accomplished by comparing the Control Room readouts in the event the RMS/ERFIS interface multiplexer is in alarm.
- 6.11** CR3, RNP, and HNP normally uses the option of "Not an Isolated Stack" because the release points do NOT meet the height and separation distance requirements of an isolated release point
- 6.12** CR3 recorder AH-1003-TIR Channel 4 indicates total Reactor Building stack flow. AH-294-FT measures Reactor Building purge flow rate only and does NOT include make up flow.
- 6.13** CR3 instrumentation available during a station blackout includes:
- RM-Gs 1, 3, 5, 7, 9, 11, 25, 26, 27, 28, 29, 30
  - RM-Ls 2, 7
  - Primary Meteorological Tower local (at the tower only) readouts
  - RM-A1, RM-A2 control room display units are powered, but pumps, skids and detectors are NOT powered.
- 6.14** RNP specific: RASCAL uses effective release height to model mixed mode releases. A release height of two hundred three (203) feet should be chosen for releases through the plant vent stack. Two hundred three feet is equivalent to the elevated level sensors at sixty-two (62) meters on the site meteorological tower. A release height of 36 feet should be chosen for release points other than the plant vent stack. Thirty-six feet is equivalent to the ground level sensors at eleven (11) meters on the site meteorological tower.
- 6.15** Verification of release mitigation actions being planned or taken is vital to accurate dose projections. Actions such as plume wash down may reduce the amount of radioactive materials released to the public.
- 6.16** Many screens in RASCAL contain a "Help" button. Clicking on the Help button provides useful information from the code developer related to information/options on that screen.
- 6.17** Dose projection results must be approved prior to communicating the information to offsite agencies. This information is typically transmitted via the Emergency Notification Form (ENF) which is approved by the Emergency Operations Facility Command position (e.g., Emergency Response Manager.)
- 6.18** Verify that the correct units and prefixes are selected when entering data. For example: height (feet or meters); prefix (milli, kilo, etc.); activity (becquerel or curie).

## **7.0 SPECIAL TOOLS AND EQUIPMENT**

7.1 RASCAL software version 3.0.5 on compatible computer

## **8.0 ACCEPTANCE CRITERIA**

N/A

## **9.0 INSTRUCTIONS**

Section 9.0 contains steps primarily associated with generic RASCAL operation. A specific Attachment exists for each NGG Site and should be referenced for additional site guidance and parameters.

- Brunswick Unit 1 and 2 (BNP): Attachment 5
- Crystal River 3 (CR3): Attachment 6
- H.B. Robinson (RNP): Attachment 7
- Shearon Harris (HNP): Attachment 8

In addition, RASCAL is a software program and alternate key strokes may be used to obtain the end result. Section 9.0 describes one acceptable method to calculate dose assessments using the RASCAL software. There are multiple options available in RASCAL that may be utilized at the discretion of the user in the calculations of dose assessments

### **9.1 RASCAL Program Startup**

9.1.1 **LOG ON** to the computer designated for RASCAL using your corporate ID and password, if not already operating.

9.1.2 **START** the RASCAL program.

9.1.3 **IF** computer difficulties are experienced when attempting to run RASCAL, **THEN USE** another computer **AND** contact the Technology Service Desk to resolve difficulties.

9.1.5 **WHEN** the RASCAL program starts and displays text showing the version, **THEN SELECT** the "OK" button (lower right) on the screen to initiate projection process.

### **9.2 THIS SECTION DELETED**

### 9.3 Select RASCAL Model

- 9.3.1 **IF** projecting doses from potential or ongoing releases and plant conditions, source term, and meteorological data are available, **THEN SELECT** Source Term to Dose Model (STDose) and proceed to step 9.4. This option is normally used for early phase dose assessment.
- 9.3.2 **IF** projecting doses from a release and at least one ground sample concentration is available, **THEN SELECT** Field Measurement to Dose Model (FMDose) and **PROCEED** to step 9.16. This option is **NOT** normally used for performing early phase dose projections.

### 9.4 Select Event Type

- 9.4.1 **IF** the actual or potential release is from a plant system, **THEN CHOOSE** Nuclear Power Plant **AND GO TO** Step 9.4.5.
- 9.4.2 **IF** the actual or potential release is from the Spent Fuel Pool, **THEN** choose Spent Fuel **AND GO TO** Step 9.4.5.
- 9.4.3 Do **NOT** select Fuel Cycle / UF6 / Criticality. This option is **NOT** currently applicable for NGG.
- 9.4.4 Do **NOT** select Other Radioactive Material Releases. This option is **NOT** currently applicable for NGG.
- 9.4.5 **SELECT** "OK" in the lower right corner of the Event Type Selection window and a ✓ mark will appear in front of Event Type when this step is complete.

### 9.5 Select Event Location

- 9.5.1 In the Site Names drop-down menu box, **CLICK** on the drop-down menu arrow, scroll down to and **SELECT** the applicable Site:
- Brunswick – Unit 1
  - Brunswick – Unit 2
  - Crystal River – Unit 3
  - H. B. Robinson – Unit 2
  - Shearon Harris – Unit 1
- 9.5.2 **SELECT** OK and a ✓ mark will appear in front of Event Location when this step is complete.

## 9.5 Select Event Location (continued)

9.5.3 IF EVENT TYPE is Nuclear Power Plant THEN GO to step 9.6, OTHERWISE GO to step 9.8 for Spent Fuel.

## 9.6 Select Nuclear Power Plant Type Source Term

This section contains options to be used for selecting source term. Sections related to source terms that are not appropriate do NOT need to be completed and the user may proceed to the desired option.

- Time Core is Uncovered - Section 9.6.1
- Ultimate Core Damage State - Section 9.6.2
- Containment Radiation Monitor - Section 9.6.3
- Coolant Sample – Section 9.6.4
- Containment Air Sample – Section 9.6.5
- Effluent Isotopic Release Rates – Section 9.6.6
- Effluent Isotopic Release Concentrations – Section 9.6.7
- Monitored Releases – Mixtures – Go to site specific procedure (References 2.2.7 – 2.2.10)

**NOTE:** Additional guidance related to Source Term and Release Path option selection is provided in Attachment 2 for all sites, Attachment 5 for BNP, Attachment 6 for CR3 and Attachment 8 for HNP.

9.6.1 IF the **Time Core is Uncovered** option is selected, THEN PERFORM the following steps.

1. IF the reactor is shutdown, THEN ENTER the date and time of shutdown.
2. IF the reactor is not shutdown, THEN ENTER the date and time of the start of the release in the "Reactor shutdown" field.
3. IF the reactor core is uncovered, THEN SELECT Yes AND ENTER the date AND time the core was uncovered. Otherwise, SELECT No.

9.6 **Select Nuclear Power Plant Type Source Term** (continued)

4. **IF** the reactor core is recovered, **THEN SELECT** Yes **AND ENTER** the date **AND** time the core was recovered. Otherwise, **SELECT** No. This step is not available if No was selected in 9.6.1.3.
5. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
6. **GO TO** Step 9.7.

9.6.2 **IF** the **Ultimate Core Damage State** option is selected, **THEN PERFORM** the following steps.

1. **IF** the reactor is shutdown, **THEN ENTER** the date and time of shutdown.
2. **IF** the reactor is not shutdown, **THEN ENTER** the date and time of the start of the release in the "Reactor shutdown" field.
3. **SELECT ONE** of the following ultimate core damage states. Read all three before selecting.
  - a. **No core damage - normal coolant activity.** **CHOOSE** this option if no core damage is suspected **AND ENTER** the time of normal coolant release date and time.
  - b. **Increased fuel pin leakage.** **CHOOSE** this option if a rapid shutdown or depressurization has occurred **AND ENTER** the time of increased fuel pin leakage date and time. A coolant contamination spike factor of 100 is appropriate as long as the core remains covered.
  - c. **Cladding failure (gap release) - with percent.** **CHOOSE** this option if the core is uncovered **OR** there is an indication of mechanical damage.
    - (1) **DETERMINE AND ENTER** percentage of gap release using the applicable site specific Attachment or other station procedures.
    - (2) **ENTER** completion of cladding failure date and time.
4. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
5. **GO TO** Step 9.7.

## 9.6 Select Nuclear Power Plant Type Source Term (continued)

9.6.3 **IF** the primary **Containment Radiation Monitor** option is selected, **THEN PERFORM** the following steps. BNP has a primary and secondary containment whereas CR3, HNP and RNP only have one "primary" containment.

1. **IF** the reactor is shutdown, **THEN ENTER** the date and time of shutdown.
2. **IF** the reactor is not shutdown, **THEN ENTER** the date and time of the start of the release in the "Reactor shutdown" field.
3. **IF** the dose assessment is for Brunswick, **THEN SELECT** monitor location for in dry well. BNP does not have a monitor in the wet well and the PWRs only have one option of containment dome for monitor location.
4. **OBTAIN** the radiation monitor reading(s) for the applicable site:
  - a. Brunswick - Unit 1:
    - (1)D22-RM-4195
    - (1)D22-RM-4196
    - (1)D22-RM-4197
    - (1)D22-RM-4198
  - b. Brunswick - Unit 2:
    - (2)D22-RM-4195
    - (2)D22-RM-4196
    - (2)D22-RM-4197
    - (2)D22-RM-4198
  - c. Crystal River - Unit 3: RM-G29 or RM-G30
  - d. H. B. Robinson - Unit 2: R-2, R-32A or R-32B
  - e. Shearon Harris - Unit 1: RM 3589 or RM 3590
5. **ENTER** the following for the radiation monitor:
  - a. Date
  - b. Time
  - c. Radiation monitor reading in R/hr
6. The use of the Add Row, Delete Row and Sort Rows buttons are optional and NOT required. Monitor readings for multiple times may be entered if the reading is changing by selecting the Add Row button. The Sort Row button arranges the readings by time.
7. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
8. **GO TO** Step 9.7.



## **9.6 Select Nuclear Power Plant Type Source Term (continued)**

**9.6.4 IF the Coolant Sample option is selected, THEN PERFORM the following steps.**

1. **ENTER** the Sample ID.
2. **ENTER** the date **AND** time the sample was taken.
3. **VERIFY** the correct sample activity units by clicking on the > symbol **AND REVISE** as necessary.
4. **ENTER** the sample nuclides **AND** activity for each nuclide.
5. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
6. **GO TO** Step 9.7.

**9.6.5 IF the Containment Air Sample option is selected, THEN PERFORM the following steps.**

1. **ENTER** the Sample ID.
2. **ENTER** the date **AND** time the sample was taken.
3. **VERIFY** the correct sample activity units by clicking on the > symbol **AND REVISE** as necessary.
4. **ENTER** the sample radionuclide **AND** activity for each radionuclide.
5. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
6. **GO TO** Step 9.7.

**9.6.6 IF the Effluent Isotopic Release Rates option is selected, THEN PERFORM the following steps.**

1. **ENTER** the measurement location (sample origin).
2. **VERIFY** the correct Effluent release rate units by clicking on the > symbol **AND REVISE** as necessary. **CONVERT** units as necessary.
3. **ENTER** the applicable Start date **AND** Start time for each release period.
4. **ENTER** the applicable Stop date **AND** Stop time for each release period.
5. **ENTER** the nuclides **AND** release rates for each period.

6. **9.6 Select Nuclear Power Plant Type Source Term** (continued)

7. **VERIFY** the percent enrichment is five percent (5%).
8. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
9. **GO TO** Step 9.7 to enter **Release Path** information.

9.6.7 **IF the Effluent Isotopic Release Concentrations option is selected, THEN PERFORM** the following steps.

1. **ENTER** the measurement location (sample origin).
2. **VERIFY** the correct Effluent flow rate units by clicking on the > symbol **AND REVISE** as necessary. **CONVERT** units as necessary.
3. **VERIFY** the correct Effluent concentration units by clicking on the > symbol **AND REVISE** as necessary. Convert units as necessary.
4. **ENTER** the applicable Start date **AND** Start time for each release period.
5. **ENTER** the applicable Stop date **AND** Stop time for each release period.
6. **ENTER** the applicable Effluent flow rate for each release period.
7. **ENTER** the nuclides **AND** concentrations for each period.
8. **VERIFY** the percent enrichment is five percent (5%).
9. **IF** the sample analysis period results are greater than 24 hours prior to the release, **AND** require decay calculation per the RCC/RCD or RCM **THEN SELECT DECAY**.
  - a. **SELECT** the period to decay isotopes.
  - b. **SELECT** the time **AND** units to adjust the source for decay prior to release time.
  - c. **SELECT** OK.
10. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
11. **GO TO** Step 9.7 to enter **Release Path** information.

## 9.7 SELECT Nuclear Power Plant Release Path

This section contains options to be used for selecting a release path. Sections related to release paths that are not appropriate do NOT need to be completed and the user may proceed to the desired option:

- Through the Wet Well - Section 9.7.1
- Through the Dry Well Wall - Section 9.7.2
- Bypass Secondary Containment - Section 9.7.3
- Containment Leakage/Failure – Section 9.7.4
- Steam Generator Tube Rupture – Section 9.7.5
- Containment Bypass – Section 9.7.6
- Direct to Atmosphere – Section 9.7.7

**NOTE:** Additional guidance related to Source Term and Release Path option selection is provided in Attachment 2 for all sites, Attachment 5 for BNP, Attachment 6 for CR3 and Attachment 8 for HNP.

**NOTE:** Sections 9.7.1 – 9.7.3 and section 9.7.7 are used for BNP release pathways. Sections 9.7.4 – 9.7.6 and section 9.7.7 are used for CR3, HNP, and RNP release pathways.

9.7.1 **IF** the **Through the Wet Well** option is selected, **THEN PERFORM** the following steps. This option is **ONLY** applicable to Brunswick Units 1 and 2 and assumes that the release passes by a wet pathway through the suppression pool into the secondary containment wet-well atmosphere. Particulates and aerosols airborne in the secondary containment wet well are reduced by factors to account for their interactions with the suppression pool under subcooled or saturated conditions.

1. **ENTER** a Pathway description.
2. **IF** the release point is through the reactor building, turbine building or radwaste building **THEN SELECT** Not an isolated stack.
  - a. **ENTER** 0 meters for the release height. This is considered a **Ground** release.
  - b. **SELECT YES** for Consider building wake effects.
  - c. **GO TO** Step 9.7.1.4.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

3. IF the release point is through the Main Stack THEN SELECT Isolated stack.
  - a. ENTER 100 meters for the stack height. This is considered an Elevated release.
  - b. IF the ambient air temperatures are not known THEN ENTER NO for Consider plume rise.
  - c. IF the ambient air temperatures are known and will be used in the meteorological data set THEN ENTER YES for Consider plume rise.
  - d. IF desired to edit plume rise settings THEN SELECT Edit Plume Rise Settings and revise:
    - 1) Effluent flow rate and units
    - 2) Stack diameter and units
    - 3) Effluent Temperature and units
4. ENTER the date AND time of the release start to wet well.
5. SELECT the Percent Volume OR Containment Pressure/Hole Size option.
6. ENTER the current date AND current time for each event row used.
  - a. IF the Percent Volume option is selected, THEN SELECT the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Total Failure (100%/hr) Percent Volume in % per day or % per hour Design (0.50%/d)
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Wet Well (OPTIONAL)	Saturated Subcooled

**9.7 SELECT Nuclear Power Plant Release Path (continued)**

- b. IF the Containment Pressure/Hole Size option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Containment pressure and units Hole area or diameter and units
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Wet Well (OPTIONAL)	Saturated Subcooled

7. **SELECT OK** and a ✓ mark will appear in front of Release Path when this step is complete.
8. **GO TO** Step 9.10.
- 9.7.2 **IF the Through the Dry Well Wall option is selected, THEN PERFORM** the following steps. This option is **ONLY** applicable to Brunswick Units 1 and 2 and assumes that the release passes by a dry pathway through the primary system into the secondary containment dry-well atmosphere without passing through the suppression pool. Particulates and aerosols airborne in the secondary containment dry well are reduced by factors to account for the actions of sprays or natural processes.
1. **ENTER** a Pathway description.
  2. **IF** the release point is through the reactor building, turbine building or radwaste building **THEN SELECT** Not an isolated stack.
    - a. **ENTER** 0 meters for the release height. This is considered a **Ground** release.
    - b. **SELECT YES** for Consider building wake effects.
    - c. **ENTER** the date **AND** time of the release start to dry well.
    - d. **GO TO** Step 9.7.2.4.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

3. **IF** the release point is through the Main Stack **THEN SELECT** Isolated stack.
  - a. **ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
  - b. **IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
  - c. **IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
  - d. **IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
    - 1) Effluent flow rate and units
    - 2) Stack diameter and units
    - 3) Effluent Temperature and units
4. **ENTER** the date **AND** time of the release start to dry well.
5. **SELECT** the Percent Volume **OR** Containment Pressure/Hole Size option.
6. **ENTER** the current date **AND** current time for each event row used.
  - a. **IF** the Percent Volume option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Total Failure (100%/hr) Percent Volume in % per day or % per hour Design (0.50%/d)
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Sprays (OPTIONAL)	On Off

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

- b. **IF** the Containment Pressure/Hole Size option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Containment pressure and units Hole area or diameter and units
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Sprays (OPTIONAL)	On Off

7. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.
8. **GO TO** Step 9.10.
- 9.7.3 **IF** the **Bypass Secondary Containment** option is selected, **THEN PERFORM** the following steps. This option is **ONLY** applicable to Brunswick Units 1 and 2.
1. **ENTER** a Pathway description.
  2. **IF** the release point is through the reactor building, turbine building or radwaste building **THEN SELECT** Not an isolated stack.
    - a. **ENTER** 0 meters for the release height. This is considered a **Ground** release.
    - b. **SELECT YES** for Consider building wake effects.
    - c. **GO TO** Step 9.7.3.4.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

3. **IF** the release point is through the Main Stack **THEN SELECT** Isolated stack.
    - a. **ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
    - b. **IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
    - c. **IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
    - d. **IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
      - 1) Effluent flow rate and units
      - 2) Stack diameter and units
      - 3) Effluent Temperature and units.
        - If plume rise is being considered and the effluent temperature is unknown assume the effluent temperature is the same as the ambient outside temperature.
  4. **ENTER** the current date **AND** current time for each event row used.
  5. **SELECT** the Event Setting options based on the following table.
- | Event                | Event Setting Choices   |
|----------------------|---|
| Leak Rate (REQUIRED) | Flow rate for the coolant bypassing the containment and units |
| Filters (OPTIONAL)   | On<br>Off   |
6. **SELECT** OK **AND** a ✓ mark will appear in front of Release Path when this step is complete.
  7. **GO TO** Step 9.10.



## 9.7 SELECT Nuclear Power Plant Release Path (continued)

9.7.4 IF the **Containment Leakage/Failure** option is selected, **THEN PERFORM** the following steps. This option is **NOT** applicable to Brunswick Units 1 and 2.

1. **ENTER** a description for the release pathway.
2. **SELECT** the Not an isolated stack **AND ENTER** the release height as listed below.
  - a. Crystal River – Unit 3: 0 meters
  - b. H. B. Robinson – Unit 2 plant vent: 62 meters or 203 feet
  - c. H. B. Robinson – Unit 2, non-plant vent: 11 meters or 36 feet
  - d. Shearon Harris – Unit 1, See Attachment 8 Section 2.0
3. **SELECT Yes** for Consider building wake effects.
4. **ENTER** the date **AND** time of the release start to containment. This step is **NOT** applicable if the source term is "containment air sample".
5. **SELECT** the Percent Volume **OR** Containment Pressure/Hole Size option.
  - a. IF the Percent Volume option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Sprays	On Off
Leak Rate	Total Failure (100%/hr) Percent Volume in % per day or % per hour Design

- b. IF the Containment Pressure/Hole Size option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Sprays	On Off
Leak Rate	Containment pressure and units Hole area or diameter and units

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

6. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.

7. **GO TO** Step 9.10.

9.7.5 **IF** the **Steam Generator Tube Rupture** option is selected, **THEN PERFORM** the following steps. This option is **NOT** applicable to Brunswick Units 1 and 2.

1. **IF** the release is through a secondary side Pressure Operated Relief Valve (PORV), a safety valve or turbine building exhaust, or directly to atmosphere through a leaking/failed component, **THEN SELECT** the Safety Valve/ADV/Turbine Building exhaust option.

a. **ENTER** the appropriate release height as shown below:

- 1) Crystal River – Unit 3: 0 meters or 0 feet
- 2) H. B. Robinson – Unit 2: 11 meters or 36 feet
- 3) Shearon Harris – Unit 1: See Attachment 8 Section 2.0

b. **GO TO** Step 9.7.5.3

2. **IF** the release is through the condenser to a plant vent via either a Steam Jet Air Ejector or a Condenser Vacuum Pump, **THEN SELECT** Steam Jet Air Ejector.

a. **ENTER** the appropriate release height as shown below:

- 1) Crystal River – Unit 3: 0 meters or 0 feet
- 2) H. B. Robinson – Unit 2: 62 meters or 203 feet
- 3) Shearon Harris – Unit 1: See Attachment 8 Section 2.0

3. **SELECT Yes** to “consider building wake effects”.

4. **ENTER** the Steam Generator water mass **IF** known otherwise use default value of 9.30 E+04 lb.

5. **ENTER** the Steaming rate **IF** known otherwise use default value of 7.50E+04 lb/h.

6. **ENTER** the current date **AND** current time for each event row used.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

**NOTE:** In RASCAL, charging flow is a generic term used to describe the leak through the tubes. The charging flow is the value that quantifies the leak or net flow.

7. **SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate into SG (REQUIRED)	Number of ruptured tubes Charging flow and units
SG Condition	Partitioned – it is partitioned if the break is under the secondary side water in the steam generator.  Not Partitioned – it is not partitioned if the break is above the secondary side water or the secondary side is solid due to in-leakage of primary coolant.

8. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.

9. **GO TO** Step 9.10.

9.7.6 **IF** the **Containment Bypass** option is chosen, **THEN PERFORM** the following steps. This option is **NOT** applicable to Brunswick Units 1 and 2.

1. **ENTER** a description for the release pathway.
2. **SELECT** the Not an isolated stack **AND ENTER** the release height as shown below:
  - a. Crystal River – Unit 3: 0 feet
  - b. H. B. Robinson – Unit 2
    - Plant Vent Stack: 62 meters or 203 feet
    - Non-Plant Vent Stack Pathway: 11 meters or 36 feet
  - c. Shearon Harris – Unit 1: See Attachment 8 Section 2.0
3. **SELECT** Yes to Consider building wake effects.
4. **ENTER** the current date **AND** current time for each event row used.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

5. **SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Flow rate for the coolant bypassing the containment and units
Filters (OPTIONAL)	On Off

6. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.

7. **GO TO** Step 9.10.

9.7.7 **IF** the release is **Direct to Atmosphere THEN PERFORM** the following steps. This release pathway is applicable to all Plants and is used automatically for the following source term options:

- Effluent Isotopic Release Rates
- Effluent Isotopic Release Concentrations
- Monitored Releases – Mixtures

1. **IF** the release point is through the **Brunswick Unit 1 or 2 Main Stack THEN SELECT** Isolated stack.

- a. **ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
- b. **IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
- c. **IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
- d. **IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
  - 1) Effluent flow rate and units
  - 2) Stack diameter and units
  - 3) Effluent Temperature and units

## 9.7 **SELECT Nuclear Power Plant Release Path** (continued)

- e. **GO TO** Step 9.7.7.4.
2. **SELECT** the Not an isolated stack **AND ENTER** the release height as listed below for all releases except from Brunswick Unit 1 or 2 Main Stack:
  - a. Brunswick – Unit 1 and Unit 2: 0 meters
  - b. Crystal River – Unit 3: 0 meters
  - c. H. B. Robinson – Unit 2 plant vent: 62 meters or 203 feet
  - d. H. B. Robinson – Unit 2, non-plant vent: 11 meters or 36 feet
  - e. Shearon Harris – See Attachment 8, Section 2.0
3. **SELECT Yes** for Consider building wake effects.
4. **ENTER** the start date **AND** time of the release to atmosphere.
5. **ENTER** End of release to atmosphere data by using one of the two options below:
  - a. **IF** the End time is known for the release period **THEN ENTER** the stop date **AND** time of the release to atmosphere.
  - b. **IF** the Release duration option is selected **THEN ENTER** the days, hours and minutes.
6. **SELECT OK** and a ✓ mark will appear in front of Release Path when this step is complete.
7. **GO TO** Step 9.10.

## 9.8 **SELECT Spent Fuel Type Source Term**

This section contains options to be used for selecting source terms for Spent Fuel accidents. Sections related to source terms that are not appropriate do NOT need to be completed and the user may proceed to the desired option.

- Pool Storage - Uncovered Fuel - Section 9.8.1
- Pool Storage – Damaged Assembly Under Water - Section 9.8.2
- Dry Storage Cask Release - Section 9.8.3

## 9.8 SELECT Spent Fuel Type Source Term (continued)

**NOTE:** Attachment 2 provides a summary of available source term selection criteria.

9.8.1 **IF** the spent fuel pool has been drained **OR** spent fuel has been uncovered > 2 hours, **THEN SELECT** Pool Storage – Uncovered Fuel **AND PERFORM** the following steps.

1. **SELECT HIGH** for Density of fuel pool racking. This step is **NOT** applicable to Brunswick Unit 1 and 2.

**NOTE:** For a fuel uncovered event, material is not considered available for release until two (2) hours after uncovered time. All fuel is considered to be damaged.

2. **SPECIFY** the amount of fuel in the pool. **IF** the Number of batches is selected for Amount of fuel in the pool **THEN ENTER** the number of batches in the pool since last irradiation as applicable for the Site location.
  - a. Brunswick – Unit 1 and 2: < 180 days, 180+ days
  - b. Crystal River – Unit 3:
    - 1) **IF** the refuel outage occurred <1 year ago, **THEN ENTER** <1 year =1; 1-2 years = 0; >2 years = last refuel number -1.
    - 2) **IF** the refuel outage occurred 1-2 years ago, **THEN ENTER** <1 year = 0; 1-2 years = 1; >2 years = last refuel number -1.
    - 3) **IF** the refuel outage occurred >2 years ago, **THEN ENTER** <1 year = 0; 1-2 years = 0; >2 years = last refuel number.
  - c. H. B. Robinson – Unit 2: <1 year, 1-2 years, and >2 years
  - d. Shearon Harris – Unit 1: <1 year, 1-2 years, and >2 years
3. **IF** the Number of assemblies is selected for Amount of Fuel in the pool **THEN ENTER** the number of assemblies in the pool since last irradiation as applicable for the Site location.
  - a. Brunswick – Unit 1 and 2: < 180 days, 180+ days
  - b. Crystal River – Unit 3: <1 year, 1-2 years, and >2 years
  - c. H. B. Robinson – Unit 2: <1 year, 1-2 years, and >2 years
  - d. Shearon Harris – Unit 1: <1 year, 1-2 years, and >2 years

**9.8 SELECT Spent Fuel Type Source Term (continued)**

4. **ENTER** the date and time of fuel uncovered.
5. **IF** the pool is totally drained, **THEN SELECT YES AND ENTER** the date and time pool was drained. Otherwise, **SELECT NO**.
6. **IF** the fuel is recovered, **THEN SELECT YES AND ENTER** the date and time fuel is recovered. Otherwise, **SELECT NO**.
7. **SELECT OK** to proceed with case development and a ✓ mark will appear in front of Source Term when this step is complete.
8. **GO** to Step 9.9.

**9.8.2 IF fuel assemblies have been damaged during handling, THEN SELECT Pool Storage – Damaged Assembly Under Water AND PERFORM** the following steps.

1. **ENTER** the number of damaged assemblies.
2. **ENTER** the Last date of irradiation **OR ENTER** how long, in years and days the damaged assemblies have been in storage.
3. **ENTER** the date and time the damage occurred to the fuel.
4. **SELECT OK** and a ✓ mark will appear in front of Source Term when this step is complete.
5. **GO** to Step 9.9.

**9.8.3 IF the spent fuel is damaged due to a dry storage cask event, THEN SELECT dry fuel storage cask event AND PERFORM** the following steps.

1. **SELECT** the type of cask if known **OTHERWISE, SELECT UNKNOWN AND ENTER** the number of fuel assemblies in a cask.
2. **ENTER** the Last date of irradiation **OR ENTER** how long, in years the damaged assemblies have been in storage.

## 9.8 SELECT Spent Fuel Type Source Term (continued)

**NOTES:** 1. No release is projected for a loss of cask cooling less than 24 hours of the thermal limit. Another event type must be selected.

2. A very minimal or no release is projected for a cask engulfed in fire. Another event type must be selected.

3. **ENTER** the type of event as major damage **AND ENTER** percent of fuel elements damaged **OTHERWISE SELECT** Loss of cooling greater than 24 hours (thermal limit).
4. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.

## 9.9 SELECT the Spent Fuel Release Path

9.9.1 **IF** the release point is through the **Brunswick Unit 1 or 2** Main Stack **THEN SELECT** Isolated stack. **OTHERWISE GO** to step 9.9.2.

1. **ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
2. **IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
3. **IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
4. **IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
  - a. Effluent flow rate and units
  - b. Stack diameter and units
  - c. Effluent Temperature and units
5. **GO TO** Step 9.9.4.

9.9.2 **ENTER** the Pathway Description



**9.9 SELECT the Spent Fuel Release Path (continued)**

**9.9.3 SELECT the NOT an isolated stack AND ENTER the release height as listed below.**

1. Brunswick – Unit 1 and Unit 2: 0 meters
2. Crystal River – Unit 3: 0 meters
3. H. B. Robinson – Unit 2 plant vent: 62 meters or 203 feet
4. H. B. Robinson – Unit 2, unmonitored or dry fuel cask event: 11 meters or 36 feet
5. Shearon Harris – Unit 1:
  - a. Stack 1: 27.4 meters (90 feet)
  - b. Stack 3: 19.2 meters (63 feet)
  - c. Stack 5: 24.1 meters (79 feet)
  - d. Stack 5A: 18.3 meters (60 feet)

**9.9.4 SELECT Yes** for Consider building wake effects.

**9.9.5 ENTER** the start date **AND** time of the release to atmosphere.

**9.9.6 ENTER End** of release to atmosphere data by using one of the two options below.

1. **IF** the End time is known for the release period **THEN ENTER** the stop date **AND** time of the release to atmosphere.
2. **IF** the Release duration option is selected **THEN ENTER** the days, hours and minutes.

**9.9.7 IF** the building with the fuel damage accident is intact, and the operating ventilation system provides filtered releases (they do not have to be safety grade filters) **THEN ENTER YES** to filtered pathway condition if the filter system includes both HEPA and charcoal. If the system only includes HEPA filters only select YES if all fuel had decayed for more than 3 months. Otherwise, **ENTER** no for all other conditions.

**9.9.8 SELECT** the Leak rate to atmosphere as Total failure **OR** Percent volume. Total failure default is 100% since this is essentially the fastest rate at which the fission products can escape the building.

1. **IF** Percent volume is selected **THEN** enter the leak rate in % per hour.

**9.9.9 SELECT OK** and a ✓ mark will appear in front of Release Path when this step is complete.

## 9.10 SELECT Meteorology

### NOTES:

1. Meteorological data should be obtained from the appropriate source. ERFIS or PICS (CR3) should be used as the primary source for meteorological data. Every effort should be made to obtain on site meteorological data. The National Weather Service, Weather Services International (wsi.com), etc. may also be used to obtain meteorological data.
2. The pre-defined (non site specific) meteorological data may also be used if ERFIS data is unavailable. The pre-defined meteorological data is based on visual observation of existing weather conditions. **Example:** Summer-Afternoon-Rainy should be chosen if visual observation of the weather support the conditions.
3. (HNP) All release points at HNP are considered to be a ground level release due to the stack height being less than 2.5 times the height of any surrounding building. Therefore, the 12.5 m wind direction and speeds are used as input into the meteorological data.

9.10.1 **OBTAIN** meteorological data for the desired Site by referring to Attachment 3 and the applicable site specific Attachment. Attachment 3 contains standard nomenclature for weather report symbols, model classes and intensities if a weather forecast is provided by an offsite weather agency.

- Brunswick Unit 1 and 2 (BNP): Attachment 5
- Crystal River 3 (CR3): Attachment 6
- H.B. Robinson (RNP): Attachment 7
- Shearon Harris (HNP): Attachment 8

9.10.2 **CONTINUE** to 9.11 to input meteorological data.

## 9.11 INPUT Meteorology

9.11.1 **SELECT** Actual Observations and Forecasts **IF** available **OTHERWISE PROCEED** to step 9.11.2.

1. **SELECT** Create New OR **SELECT** Edit Existing.
2. **SELECT** Enter Data.
3. **SELECT** OBS for observed data OR FCST for forecast data TYPE as appropriate.

### CAUTION

RASCAL rounds meteorological data times to the nearest quarter hour. If the meteorological data time is the same as the release time and both are in the second half of a quarter hour (e.g., 0008-0014), RASCAL rounds the meteorological data time to 0015 which is after the release time and causes an error. To prevent this error, meteorological time should be adjusted to the first half of the quarter hour (e.g., 0000-0007).

4. **ENTER** the date and time for each data set.
5. **ENTER** the Direction "From" in degrees for each data set.
  - a. **IF** the instrument reading is greater than 360, **THEN** subtract 360 from the reading and enter.
6. **ENTER** the speed in mph.
  - a. **IF** an adverse met data dose projection is being performed, **THEN ENTER** a speed of 1 mph. (HNP)
7. **ENTER** stability class using the drop-down list selection.
  - a. **IF** an adverse met data dose projection is being performed **THEN ENTER** a stability class of G. (HNP)
8. **ENTER** the Precipitation type using the drop-down list selection.
  - No precipitation: <0.01 in/hr.
  - Light rain: 0.01 to 0.04 in/hr.
  - Rain: >0.04 to 0.2 in/hr.
  - Heavy rain: >0.2 in/hr.

## 9.11 INPUT Meteorology (continued)

9. **ENTER** OPTIONAL parameters if desired but they are NOT required:
  - a. Air Temperature in degrees Fahrenheit
  - b. Air Pressure (mb)
  - c. Dew Point in degrees Fahrenheit
10. **IF** an additional record is going to be added **SELECT** Add record.
  - a. **REPEAT** steps 9.11.1.3 – 9.11.1.10.
11. **SELECT** “OK” in the bottom right of the screen.
12. **SELECT** “Save and Process Data”.
13. **ENTER** a name for the meteorological observation data set. This allows for repeated updating of new met data saved under different names for future retrieval.

**Example:** 090108 1100 (Date and time)

**NOTE:** The parameters listed below are not normally changed from the computer specified default values but the option is available. The RCC/RCD or RCM should be consulted prior to changing.

14. **VERIFY** the following options are selected **AND EDIT** as necessary.
  - a. Data set description: Created automatically from first site data record
  - b. Save data set as: Event-specific data set
  - c. Data processing options – Estimate missing stability using: Wind speed, time of day, etc. (recommended)
  - d. Adjust stability for consistency: Yes (recommended)
  - e. Modify winds for topography: Yes
15. **SELECT** OK.
16. **SELECT** Return.
17. **SELECT** OK and a ✓ mark will appear in front of Meteorology when this step is complete.

### 9.11 INPUT Meteorology (continued)

18. **GO TO** Step 9.12.

9.11.2 **IF** no actual observation or forecast data is available **SELECT** Predefined Data (Non Site-specific).

1. **SELECT** the available data set that most resembles current weather conditions at the site.
2. **SELECT** OK and a ✓ mark will appear in front of Meteorology when this step is complete.

### 9.12 SELECT Calculate Doses

9.12.1 **SELECT** the appropriate distances for calculations. Typically the "Close in + out to 10 miles" option is chosen to supply the required results.

9.12.2 **IF** the dose assessment is for Brunswick Unit 1 or 2 **GO TO** step 9.12.6.

9.12.3 **SELECT** user defined distances **AND** Set Close Distances.

9.12.4 **ENTER** the applicable site boundary distance of the non-UF6 Release as applicable:

1. Crystal River 3: **REPLACE** 1.000 mile with 0.83 miles.
2. Harris Plant: **REPLACE** 0.500 miles with 0.47 miles.
3. Robinson Plant: **REPLACE** 0.200 miles with 0.265 miles.

9.12.5 **SELECT** OK.

#### CAUTION

The "Start of release to atmosphere plus" value is NOT the same as the release duration. The "Start of release to atmosphere plus" provides for a time duration long enough for the entire plume to pass over the region of interest. This time includes the release duration plus enough time for the entire plume to cover the area of interest. The wind speed needs to be taken into account.

9.12.6 **COMPLETE** the "End Calculations at" field.

1. **SELECT** "Start of release to atmosphere plus" **THEN ENTER** the number of hours. The default is 6 hours and is sufficient during the early phases of a release, **OR**
2. **SELECT** User specified time **THEN ENTER** the date and time. This option is normally used as additional information becomes available.

## 9.12 SELECT Calculate Doses (continued)

9.12.7 **ENTER** the Case description. A case description is required for identification of variations of case input data. **SELECT** OK to begin calculations and a ✓ mark will appear in front of Calculate Doses when this step is complete.

## 9.13 REVIEW Detailed Results

This step is **optional** and can be used to view detailed results that are useful in comparing projections with field team data. However critical information shall not be delayed to perform review details.

9.13.1 **SELECT** Detailed Results.

9.13.2 **SELECT** the desired options on the Detailed Results of Dose Calculations screen.

9.13.3 **SELECT** Display Selected Result button and the graphic display of plume footprint for the calculated case is presented on screen. **POSITION** cursor over cell to view specific bearing, distance, or dose.

9.13.4 **SELECT** OK, then **EXIT** to return to primary screen for completing a dose assessment.

## 9.14 Dose Projection Results

### CAUTION

Time is of the essence when conducting and approving dose projections. Dose projection results may escalate **OR** preclude emergency action level declarations.

**NOTE:** Projections developed when there is no release in progress and using "what if" data parameters are not required to be reviewed and approved. "What if" scenarios should not be disseminated to ERO personnel excluding the RCM or RCC or RCD.

9.14.1 **SELECT AND PRINT** the reports from the Maximum Dose Values tab **AND** the Source Term Summary tab.

#### 9.14 Dose Projection Results (continued)

**NOTE:** The appropriate printer must be selected in the Print Setup option under the RASCAL File menu. This is in addition to the Windows default printer selection.

9.14.2 **PEER CHECK** the dose assessment with the assistance of another dose assessment team member, leader, RCC, RCD or RCM. The peer check shall at a minimum provide verification that:

- a. Release parameters are correct
- b. The results do not affect the current EAL classification
- c. The results do not change any Protective Action Recommendations

9.14.3 **COMPARE** dose projection results with alternate methods of dose projection, if available. These include:

- a. Comparison with field monitoring. The RASCAL detailed results provides the capability to determine location and time specific values for dose rates and airborne concentrations. These detailed results should be compared with actual field measurements and adjustments made as necessary. Field measurements may be available from utility teams, state teams, or federal teams, including fly-over surveys.
- b. Comparison with state or NRC dose projection results. Share dose projection results with state and NRC dose projection personnel. Attempt to explain any significant differences as time permits.

9.14.4 **IF** the dose projection is incorrect, **THEN** develop a new dose projection.

#### 9.14 Dose Projection Results (continued)

9.14.5 **IF** the projection is correct, **THEN** provide the RCM the projection print-outs for approval.

**NOTE:** Dose projection results must be approved prior to communicating the information to offsite agencies. This information is typically transmitted via the Emergency Notification Form (ENF) which is approved by the Emergency Operations Facility Command position (e.g., Emergency Response Manager.)

9.14.6 The RCM shall **REVIEW AND APPROVE** the projection. Approval is to acknowledge the:

- Dose projection is accurate.
- PARs are developed.
- Information is communicated for ENF transmittal. Dose information from the Maximum Dose Values Report should be converted from Rem to mRem prior to entering it on the ENF.

9.14.7 The RCM shall **SIGN AND DATE** the dose projection to denote approval.

9.14.8 The RCM shall **IMMEDIATELY COMMUNICATE** dose projection results for evaluation of an EAL classification impact to the Site Emergency Coordinator.

9.14.9 The RCM shall **COMMUNICATE** dose projection results **IMMEDIATELY** to the EOF if PARs are impacted OR no later than the next EOF briefing if PARs are not impacted.

9.14.10 **PROVIDE** a copy to the RASCAL Case Summary to State Dose Projection personnel at the State EOC and/or EOF for each projection released on the Emergency Notification Form (ENF).

9.14.11 **IF** the dose calculation is for **CRYSTAL RIVER 3** **THEN** fill in the blank projection duration (Item 14) of the Florida Nuclear Plant Emergency Notification Form with the correct time frame.



#### 9.14 Dose Projection Results (continued)

**NOTE:** If an approved computer application is available for transferring dose projection information to the ENF electronically, then this application should be used.

- 9.14.12 **ENTER** the Noble Gas Activity and the Iodine Activity in Curies for Release Magnitude on Line 14 of the ENF using the Source Term Summary Report. The total activity is acceptable for reporting purposes unless a specific breakdown is requested by local State or county emergency management personnel. This step is NOT applicable to CR3.
- 9.14.13 **CONVERT** the RASCAL results in REM to mRem **AND ENTER** the Total Effective Dose Equivalent (TEDE) in mRem for the following distances in the appropriate blocks of the ENF using the Maximum Dose Values Report:
- site boundary
  - 2.0 mile
  - 5.0 mile, and
  - 10 mile
- 9.14.14 **CONVERT** the RASCAL results in REM to mRem **AND ENTER** the Thyroid Committed Dose Equivalent (CDE) in mRem for the following distances in the appropriate blocks of the ENF using the Maximum Dose Values Report:
- site boundary,
  - 2.0 mile
  - 5.0 mile, and
  - 10 mile

## 9.15 Save the Case

9.15.1 **SELECT** Save Case to save the projection for future review or revision. Consider the following:

1. The user creates the file name and RASCAL saves the projection file with a .STD extension.
2. The default folder for saved cases is C:\Program Files\RASCAL3\Save Case\.
3. The user may create a new subfolder for a group of projections for the current event. The recommended location for a new subfolder on the C: drive is under the default Save Case folder.
4. The case may be saved to a shared folder to allow both the TSC and EOF access. The recommended location for a shared folder is in the applicable site drive:\Shared\RASCAL\. For example Crystal River 3 would use L:\Shared\RASCAL\. Subfolders may be created in the shared directory if desired.
5. The case may be saved to a specific file that is used for direct input to the Emergency Notification Form via WEBEOC. The case should only be saved here after approval by the RCM. The file name must remain as exists (e.g., don't add a date). Saving the case to this file will delete the previous case saved in this location. The specific location for each site is:
  - a. BNP K:\SHARED\EP\ENF DATA\BNP WEBEOC.STD
  - b. CR3 Does not have direct transfer to ENF capability
  - c. HNP Y:\Shared\Emergency Preparedness\ENF\_Data\ HNP Unit 1 WebEOC.STD
  - d. RNP V:\Shared\Emergency Preparedness\ENF DATA\RNP Dose.STD

9.15.2 **IF** the default folder is not going to be used **THEN CHANGE** the directory as applicable.

9.15.3 **ENTER** a File Name.

**NOTE:** If the shared case is to be modified, it needs to be copied back to the C:\RASCAL\Save Case\ folder on the hard drive. Otherwise, an error is encountered when editing met data.

9.15.4 **SELECT** Save.

## 9.16 Field Measurements to Dose Model (FMDose)

The Field Measurement to Dose model would normally be used after releases had ended to determine whether the area is habitable or do residents need long-term relocation. The model estimates doses based upon measurement of ground contamination.

9.16.1 **IF** projecting doses from a release and at least one ground sample concentration for that sample location is available, **THEN** select Field Measurement to Dose Model (FMDose). This option is **NOT** normally used for performing early phase dose projections.

9.16.2 **SELECT** Event Description.

1. **ENTER** the Event name.
2. The following information is OPTIONAL and not required. **ENTER** the following as desired.
  - a. Date **AND** time the release started.
  - b. Release location in latitude **AND** longitude degrees.
3. **SELECT** OK and a ✓ mark will appear in front of Event Description when this step is complete.

9.16.3 **SELECT** Sample Data.

1. **ENTER** the Sample ID.
2. **ENTER** the Date **AND** time the sample was analyzed.
3. **VERIFY** the correct sample ground concentration units by clicking on the > symbol **AND REVISE** as necessary.
4. **ENTER** the sample nuclide **AND** ground concentration for each radionuclide.
5. The following information is OPTIONAL and not required. **ENTER** the following as desired.
  - a. Sample location in latitude **AND** longitude degrees.
  - b. Sample description.
6. **SELECT** OK and a ✓ mark will appear in front of Sample Data when this step is complete.

## 9.16 Field Measurements to Dose Model (FMDose) (continued)

9.16.4 **SELECT** Calculation Options **AND REVISE** the following parameters as necessary.

1. Intermediate Phase
  - a. Reentry delay in days
  - b. Select the DIL marker nuclide. The DIL marker is a single radionuclide contained in deposition or a sample that is easily identified in the field. It is used to determine areas of concern before performing a comprehensive isotopic analysis.
2. Factors used with Ground Concentrations
  - a. Ground roughness correction factor
  - b. Initial resuspension factor per meter
  - c. Inadvertent ingestion rate in  $\text{cm}^2$  per day
  - d. Occupancy time in hours per week
  - e. Calculation settings in the desired units.
3. **SELECT** OK and a ✓ mark will appear in front of Calculation Options when this step is complete.

9.16.5 **SELECT** Compute Doses.

1. **SELECT** the desired data to review. Options include:
  - Intermediate Phase Doses
  - Deposition Exposure Rate DILs
  - Marker Nuclide Concentration DILs
2. **SELECT** Print as desired.

9.16.6 **SAVE** the case per Section 9.15.

## 9.17 Multiple Release Points

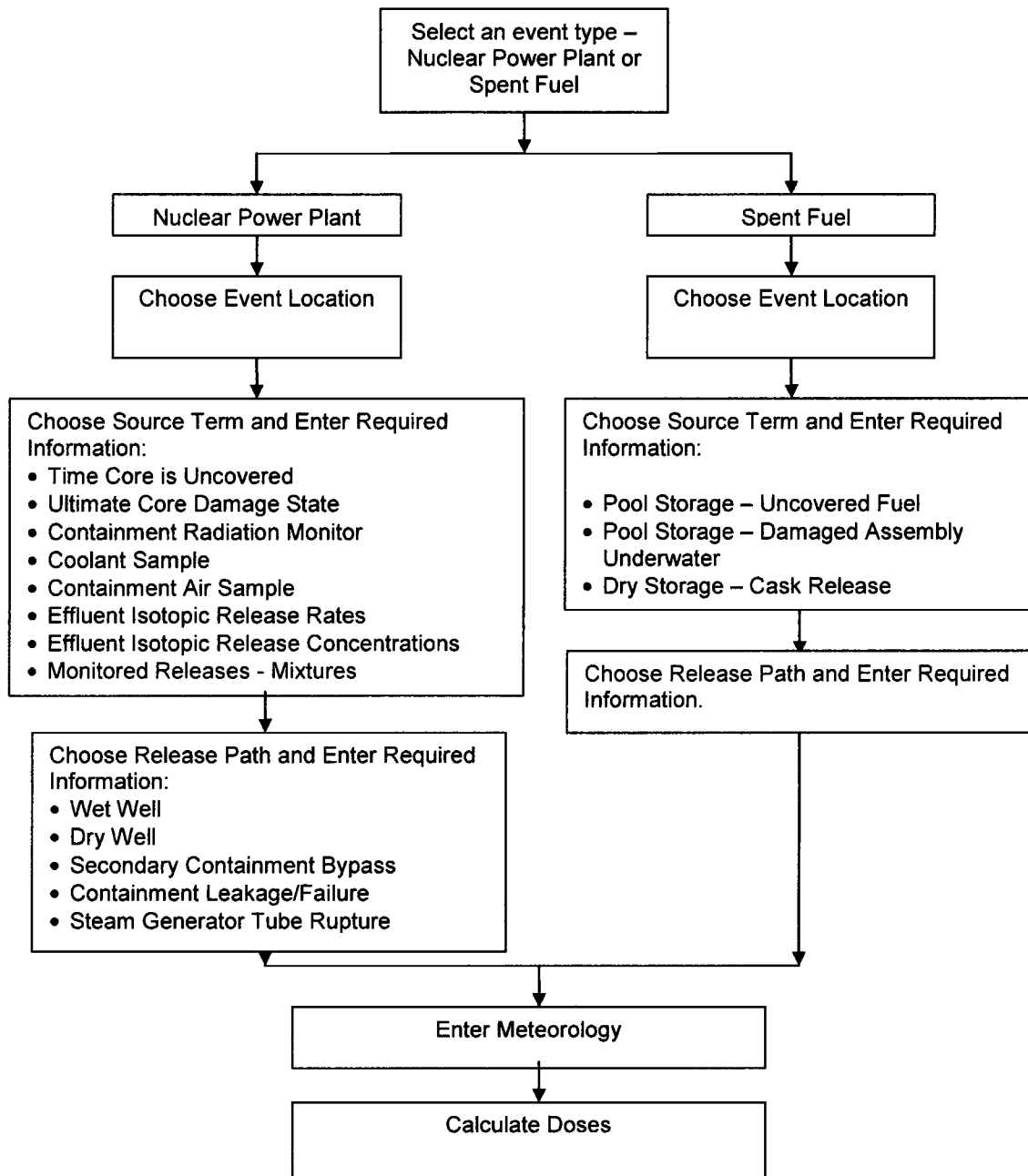
9.17.1 **PERFORM** a separate RASCAL dose projection run for each release point.

9.17.2 Attachment 4, Multiple Release Point Calculation Sheet can be used as an aid for radioactive material releases from multiple plant locations.

## 10.0 RECORDS

Records generated as a result of the performance of this procedure shall be submitted to Emergency Preparedness for retention in the plant vault.

**ATTACHMENT 1**  
**Sheet 1 of 1**  
**RASCAL General Flowpath**



**ATTACHMENT 2**  
**Sheet 1 of 2**  
**Source Term Type Selection Guide**

This table lists all the source term types available for nuclear power plant accidents, guidance on when to use each type and the source terms available.

Source Term Type	When Used	Data Needed	Available Release Paths
<b>Time Core Uncovered</b> (Procedure Step 9.6.1)	Use when you can estimate how long the core will be uncovered and you want RASCAL to estimate the core damage that will result. Catastrophic event/release. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Reactor Shutdown? Date/Time Core Uncovered? Date/Time Core Recovered? Date/Time	<b>BWR:</b> Wet Well Dry Well Secondary Containment Bypass <b>PWR:</b> Containment leakage/failure Steam generator tube rupture Containment bypass
<b>Ultimate Core Damage State</b> (Procedure Step 9.6.2)	Use this option when you believe you can make a valid estimate of the amount of core damage that has occurred. It can also be used for "what if" analyses. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Reactor Shutdown? Date/Time Core Damage state No damage Fuel pin leakage Cladding failure  Time/Date coolant release	<b>BWR:</b> Wet Well Dry Well Secondary Containment Bypass <b>PWR:</b> Containment leakage/failure Steam generator tube rupture Containment bypass
<b>Containment Radiation Monitor</b> (Procedure Step 9.6.3)	Use containment radiation monitor when you have readings from the containment monitor, you want the code to estimate the core damage from the readings. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Reactor Shutdown? Date/Time Core Uncovered? Date/Time Containment Monitor Reading/Date/Time	<b>BWR:</b> Wet Well Dry Well <b>PWR:</b> Containment leakage/failure
<b>Coolant Sample</b> (Procedure Step 9.6.4)	Use coolant sample when you know the coolant activity and coolant will be released to the atmosphere. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Sample ID Date/Time Activity (Isotopic)	<b>BWR:</b> Secondary Containment Bypass <b>PWR:</b> Steam generator tube rupture Containment bypass
<b>Containment Air Sample</b> (Procedure Step 9.6.5)	Use air sample when you know the activity in the containment air and it will be released to the atmosphere via Containment leakage or failure. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Sample ID Date/Time Activity (Isotopic)	<b>BWR:</b> Wet Well Dry Well Secondary Containment Bypass <b>PWR:</b> Containment leakage/failure

**ATTACHMENT 2**  
**Sheet 2 of 2**  
**Source Term Type Selection Guide**

Source Term Type	When Used	Data Needed	Available Release Paths
<b>Effluent Isotopic Release Rates</b> (Procedure Step 9.6.6)	Use the effluent rate when the release is through a sampled pathway that allows determination of the release rate of nuclides in terms of activity per unit time.	Release Location Release Period(s) Date/Time Activity (Isotopic)/unit time	Release direct to atmosphere
<b>Effluent Isotopic Release Concentrations</b> (Procedure Step 9.6.7)	Use the effluent concentration when the release is through a sampled pathway that allows determination of the release flow rate and the concentrations of nuclides in terms of activity per unit volume.	Release Location Release Period(s) Date/Time Activity (Isotopic)/volume	Release direct to atmosphere
<b>Monitored Releases – Mixtures</b> (Site specific procedures) BNP: OPEP-03.4.8 CR3: EM-204B HNP: PEP-344 RNP: EPRAD-03	Use the gross concentration method when you know the concentration of the activity being released, but you do not know the composition by nuclide. Site procedures provide the method to calculate release rates (Ci/sec) for noble gases, iodines and particulates using radiation monitor and flow rate information.	Reactor Shutdown? Date/Time Date/Time Sample Date/Time Release Rate Unit Release rates for: noble gases iodines particulates	Release direct to atmosphere
<b>Pool Storage – Uncovered Fuel</b> (Procedure step 9.8.1)	Use this source term when fuel is exposed above the water.	Density of fuel pool racking Number or batches of assemblies irradiated within 1,2 and 3 years Fuel uncovered? Date/Time Pool totally drained? Yes/No Fuel recovered? Yes/No	Spent fuel release pathway
<b>Pool Storage – Damaged Assembly Underwater</b> (Procedure step 9.8.2)	Use this source term when there are damaged assemblies underwater.	Number of damaged assemblies Age of damaged assemblies or how long damaged assemblies have been in storage When damage occurred – Date/Time	Spent fuel release pathway
<b>Dry Storage – Cask Release</b> (procedure step 9.8.3)	Use this source term when there are damaged assemblies in a cask.	Type of Cask Age of damaged assemblies Type of Event	Spent fuel release pathway

**ATTACHMENT 3**  
**Sheet 1 of 1**  
**Weather Report Symbol, Model Class, and Intensity**

The following table lists typical nomenclature used by offsite weather agencies to report actual and forecast meteorological data. The table can be used to aid in interpretation of offsite meteorological information received.

<b>WEATHER REPORT SYMBOL</b>	<b>MODEL CLASS</b>	<b>INTENSITY</b>
None	NONE	- - -
A	SNOW	Moderate
IC-, IP-	SNOW	Light
IC, IP	SNOW	Moderate
IC+, IP+	SNOW	Heavy
L-, L, L+	RAIN	Light
R-, RW-	RAIN	Light
R, RW	RAIN	Moderate
R+, RW+	RAIN	Heavy
S-, SG-, SP-, SW-	SNOW	Light
S, SG, SP, SW	SNOW	Moderate
S+, SG+, SP+, SW+	SNOW	Heavy
ZL-, ZL, ZL+, ZR-	RAIN	Light
ZR	RAIN	Moderate
ZR+	RAIN	Heavy



**ATTACHMENT 4**  
**Sheet 1 of 1**  
**Multiple Release Point Calculation Sheet**

RELEASE CHARACTERISTIC	TIME	TEDE (Site Boundary)	TEDE (2 Mile)	TEDE ( 5 Mile )	TEDE (10 Mile)	Total Curies
Main Stack						
Turbine Building						
Reactor or Auxiliary Building						
Torus Vent						
Other						
(1) TEDE SUM TOTAL						
(2) CURIE SUM TOTAL						(2)
	TIME	Thyroid CDE (Site Boundary )	Thyroid CDE (2 Mile)	Thyroid CDE ( 5 Mile )	Thyroid CDE (10 Mile)	
Main Stack						
Turbine Building						
Reactor or Auxiliary Building						
Torus Vent						
Other						
(3) Thyroid CDE TOTAL						

NOTE: TEDE and Thyroid CDE Summation are in units of REM and must be converted to Units of mrem prior to entering the information onto the Emergency Notification Form ( (1) or (3) \_\_\_ Rem x 1000 = \_\_\_ mrem)

- (1) Each TEDE Column Total corresponds to the TEDE line of the Emergency Notification Form.
- (2) Enter the Sum of Total Curies on line 14 MAGNITUDE: (Other) of the Emergency Notification Form (BNP, HNP and RNP only).
- (3) Thyroid CDE Column Total corresponds to line 16 (Thyroid CDE) of the Emergency Notification Form (BNP, HNP and RNP only).

**ATTACHMENT 5**  
**Sheet 1 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

This attachment contains the following sections:

- 1.0 Brunswick Unit 1 and 2 Default Data
- 2.0 Data Sheet for Dose Projections
- 3.0 Meteorology
- 4.0 BNP Pathway/Source Term Option Guidance

**1.0 Brunswick Unit 1 and 2 Default Data**

**Unit 1:**

<b>Average reactor power MW(th)</b>	2923	<b>Coolant volume (gal)</b>	3.379E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	30000
<b>Number of assemblies in core</b>	560	<b>Containment volume (ft<sup>3</sup>)</b>	1.641E+05	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	50000

**Unit 2:**

<b>Average reactor power MW(th)</b>	2923	<b>Coolant volume (gal)</b>	3.218E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	30000
<b>Number of assemblies in core</b>	560	<b>Containment volume (ft<sup>3</sup>)</b>	1.641E+05	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	50000

**ATTACHMENT 5**  
**Sheet 2 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**2.0 Data Sheet for Dose Projections**

CHARACTERISTIC	TIME						
Main Stack	Release Rate ( $\mu$ Ci/cc)						
	Flow Rate (CFM)						
Turbine Building	#1 Release Rate ( $\mu$ Ci/cc)						
	#1 Flow Rate (CFM)						
	#2 Release Rate ( $\mu$ Ci/cc)						
	#2 Flow Rate (CFM)						
Reactor Building	Release Rate ( $\mu$ Ci/cc)						
	Flow Rate (CFM)						
Torus Vent	Release Rate ( $\mu$ Ci/cc)						
Core Uncovered	Time (1) lost/ (2) Returned						
Effective Filtration	Yes / No						
Release Height	Ground						
	Elevated						
Release Duration	Anticipated Length of Time						
Shutdown	Date						
	Time						
Met Data Wind Speed	Upper						
	Lower						
Met Data Direction	Upper						
	Lower						
Stability	Class						
Seabreeze	Yes / No						

**ATTACHMENT 5**  
**Sheet 3 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

**3.1 IF** available **ACQUIRE** meteorological data by ERFIS.

3.1.1 **PRESS** the RETURN <CR> key a couple of times to awake the terminal.

3.1.2 **IF** the Terminal server port has been Logged-Off, **THEN ENTER** your name when prompted, **AND PRESS** RETURN <CR>. Any name will do, such as your last name.

**NOTES:**

1. The server prompt looks like "local>" or "DSVRxx" where xx is one of many ERFIS terminal server numbers.
2. Several of the connect messages may have to be tried to find an active connection.
3. Use Connect Sim for link to Simulator. This provides canned data. The other four will connect to live met data.

3.1.3 **IF** terminal is not in the above prompt condition at start of entry, **THEN CONTACT** ERFIS duty pager.

3.1.4 **TYPE** any one of the following at the keyboard, **WHEN** either of the prompts are displayed:

- CONNECT SIM <CR> For the Simulator Computer.
- CONNECT ECO1A <CR> For the U1 ERFIS Computer TRA.
- CONNECT ECO1B <CR> For the U1 ERFIS Computer RTAD.
- CONNECT ECO2A <CR> For the U2 ERFIS Computer TRA.
- CONNECT ECO2B <CR> For the U2 ERFIS Computer RTAD.

3.1.5 **TYPE** your assigned USERNAME at the next LOGIN prompt. For example:  
USERNAME: xxxxxxxxxx gepacuser <CR>

3.1.6 **TYPE** your assigned PASSWORD at the next LOGIN prompt. For example:  
PASSWORD: xxxxxxxxxx gepac <CR>**IF** your next prompt is "Enter your last Name:" For example: xxxxxx <CR>

**ATTACHMENT 5**  
**Sheet 4 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

- 3.1.7 **TYPE** your last name or work group, for example OPS, CHEMISTRY etc. **THEN** the Computer Node prompt will appear (i.e., \$, ECO1A::>, ECO1B::>, ECO2A::>, or ECO2B::>).
- 3.1.8 **TYPE W <CR>** and the ERFIS computer will display your WEATHER for the previous 15 minutes. The W\*EATHER is a logical name assigned to all the computers listed above.

**NOTES:**

1. Typing W <CR> is all that is necessary because no other DIGITAL Command starts with this letter.
2. Weather is obtained by modem from the ERFIS computer to the MET Tower every 15 minutes. Always use the Logical W\*EATHER for update to obtain the latest information.

- 3.1.9 **TYPE LOG <CR>** to end the connection to any of the above Computers, **AND TERMINATE** the process.

- 3.2 IF** ERFIS data is unavailable **THEN OBTAIN** Brunswick Nuclear Power Plant (BNP) Meteorological Data from the National Weather Service **OR** Wilmington National Weather Service data by phone. (See EPL-001, Emergency Phone List, for the telephone number).

- 3.3 DETERMINE** the Sea Breeze Potential.

- 3.3.1 **IF** all of the following conditions are present, **THEN** the potential for a Sea Breeze Effect exists:

1. BNP wind direction is between 16° and 269°, **AND**
2. BNP Stability class of A, B, or C
3. Meteorological Data Record time is between 0700 and 1900 hours, **AND**
4. Meteorological Data Record date and date of Sea Breeze onset time are the same.

**ATTACHMENT 5**  
**Sheet 5 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

**3.4 IF** a Sea Breeze is present, **THEN** RASCAL projections may underestimate the dose by a factor of 2.5, and the plume behavior may be erratic. Entering additional weather station data will improve the accuracy of modeling a sea breeze condition.

3.4.1 **IF** Sea Breeze conditions exist during the case calculations, **THEN CONSPICUOUSLY MARK** printed reports as such.

3.4.2 **POINT** this out **AND COMMUNICATE** to the RCD, RCM, and other dose projection coordinators, when the reports are made available to them.

**3.5 OBTAIN** stability class from the Met Tower.

**3.6 DETERMINE** the stability class.

3.6.1 **IF** available **OBTAIN** data for stability class from the Met Tower.

3.6.2 **IF** stability class data is not available from the Met Tower **THEN CALL** the National Weather Service to obtain the data.

3.6.3 **IF** stability class data is not available from the Met Tower or National Weather Service **THEN DETERMINE** the class using the following steps.

**NOTES:**

1. **Delta T** - (Preferred method of determination) - Temperature difference between the 10m and 100m measuring points on the Met tower. Normally a negative number, but could be positive if a temperature inversion exists.
2. **Sigma theta** - (Secondary method of determination) -Standard deviation of the horizontal wind direction fluctuation.

1. **IF** meteorological data is available **THEN OBTAIN** Delta T1 and Delta T2.

a. **CALCULATE** the Differential Temperature **BY SUMMING** Delta T1 and Delta T2 **THEN DIVIDING** by 2. See equation below:

$$\frac{DT1+DT2}{2} = \text{_____} \text{ C/100M}$$

**ATTACHMENT 5**  
**Sheet 6 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

- b. **COMPARE** the differential temperature in the table below to the Pasquill categories to determine the stability class.

STABILITY CLASSIFICATION	PASQUILL CATEGORIES	Differential Temperature C/100M
Extremely Unstable	A	<-1.9
Moderately Unstable	B	-1.9 TO -1.7
Slightly Unstable	C	-1.7 TO -1.5
Neutral	D	-1.5 TO -0.5
Slightly Stable	E	-.05 TO +1.5
Moderately Stable	F	+1.5 TO +4.0
Extremely Stable	G	> +4.0

2. **IF** there is no stability class data readily available, **AND** it is raining **THEN ASSUME** the stability class is D, **OTHERWISE ESTIMATE** the current Atmospheric Stability Class by visual observation using the following table:

	SUNNY DAY	CLOUDY DAY	CLOUDY NIGHT	CLEAR NIGHT
LIGHT WIND/OR CALM ≤ 4 m/sec or 8.9 mph	B	C	E	F
MODERATELY STRONG WIND ≥ 4 m/sec or 8.9 mph	C	D	D	D

**ATTACHMENT 5**  
**Sheet 7 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

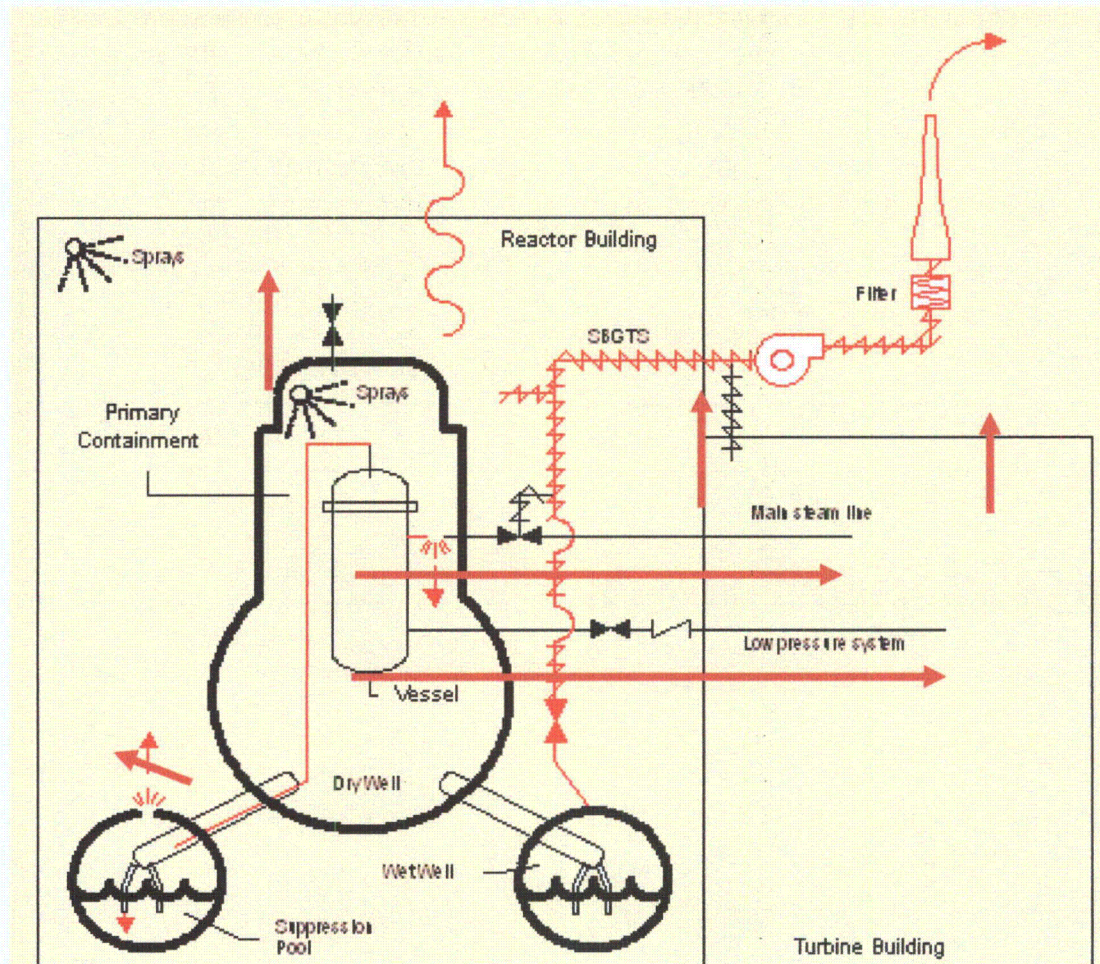
3.6.4 **REFER** to the following table when an elevated release exists since, maximum radiological exposures may occur beyond the site boundary depending on Stability Class. For example:

STABILITY CLASS	DOWNWIND DISTANCE
A	0.27 MILES
B	0.45 MILES
C	0.76 MILES
D	1.8 MILES
E	3.5 MILES
F	9 MILES
G	33 MILES



**ATTACHMENT 5**  
**Sheet 8 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**4.0 BNP PATHWAY/SOURCE TERM OPTION GUIDANCE**



**Pathways**

Vessel ---Drywell-----	Environment-----	pathway 1	unmonitored			
Vessel--- Drywell ----	Reactor Building-----	Environment-----	pathway 2	monitored		
Vessel---Drywell--	Reactor Building	SSGTS--stack--	Environment--	pathway 3	monitored	
Vessel---Torus-----	Environment-----			pathway 4	unmonitored	
Vessel--- Torus---	Reactor Building--	SSGT--	stack--	Environment---	pathway 5	monitored
Vessel--- Torus---	Reactor Building-----	Environment-----		pathway 6	monitored	
Vessel---Turbine Building---	Environment-----			pathway 7	unmonitored	
Vessel---Turbine Building---	Environment-----			pathway 8	monitored	
Vessel---Turbine Building---	SSGT----	stack-----		pathway 9	monitored	

**ATTACHMENT 5**  
**Sheet 9 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**Source Term**

Pathway 1-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 2-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 3-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 4-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 5-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 6-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 7-----Time Core is Uncovered  
Ultimate Core Damage State  
Coolant Sample

Pathway 8-----Time Core is Uncovered  
Ultimate Core Damage State  
Coolant Sample

Pathway 9-----Time Core is Uncovered  
Ultimate Core Damage State  
Coolant Sample

**ATTACHMENT 6**  
**Sheet 1 of 10**  
**Crystal River Specific Actions and Parameters**

This attachment contains:

- 1.0 Crystal River 3 Default Data – Sheet 1
- 2.0 CR3 Accident Types With Rascal Source Term/Release Path Options – Sheet 2  
This sheet provides guidance for selecting RASCAL source term and release path options. Assumptions should be verified with the Technical Support Team and/or the Accident Assessment Team.
- 3.0 Site Boundary (0.83 miles) Dose Estimate Credibility Evaluation – Sheet 3
- 4.0 Meteorological Data Input Sheet – Sheet 5
- 5.0 Radiological Data Input Sheet - Sheet 6
- 6.0 Alternate Methods For Determining Meteorological Data – Sheet 7
- 7.0 Methods For Determining Core Damage - Sheet 8

**1.0 Crystal River 3 Default Data (Edit plant parameters as necessary.)**

<b>Average reactor power MW(th)</b>	2609	<b>Coolant volume (gal)</b>	9.401E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	42000
<b>Number of assemblies in core</b>	177	<b>Containment volume (ft<sup>3</sup>)</b>	2.000E+06	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	35000

**ATTACHMENT 6**  
**Sheet 2 of 10**  
**Crystal River Specific Actions and Parameters**

**2.0 CR3 ACCIDENT TYPES WITH RASCAL SOURCE TERM / RELEASE PATH OPTIONS**

ACCIDENT TYPE	RELEASE POINT	RASCAL SOURCE TERM OPTIONS	RASCAL RELEASE PATH OPTIONS
LOCA in containment	Containment to atmosphere	Ultimate Core Damage State	Containment Leakage/Failure with pressure/hole size selected OR percent volume selected for Design Basis Leakage
		Containment Rad Monitor	
		Containment Air Sample	
		Time Core is Uncovered	
	Containment to Intermediate Bldg	Ultimate Core Damage State	Containment Leakage/Failure with pressure/hole size selected
		Containment Rad Monitor	
		Containment Air Sample	
		Time Core is Uncovered	
	Containment to Aux Bldg	Refer to LOCA in Aux Bldg	Refer to LOCA in Aux Bldg
	Post-accident venting	Monitored Release – Mixture*	Release Direct to Atmosphere
		Coolant Sample	Containment Bypass or Containment Leakage/Failure selected
		Ultimate Core Damage State	
		Time Core is Uncovered	
LOCA in Aux Bldg	Aux Bldg	Monitored Release – Mixture*	Release Direct to Atmosphere
		Effluent Isotopic Release Conc	Containment Bypass or Containment Leakage/Failure selected
		Ultimate Core Damage State	
		Containment Rad Monitor	
Steam Gen Tube Rupture	Steaming to atmosphere	Coolant Sample	Steam Generator Tube Rupture
		Ultimate Core Damage State	
	Condenser to Aux Bldg vent	Monitored Release – Mixture*	Release Direct to Atmosphere
		Ultimate Core Damage State	Steam Generator Tube Rupture
Fuel Handling	Aux Bldg	Pool Storage – Damage Underwater	Spent Fuel Release Path
		Pool Storage – Fuel Uncovered	
		Monitored Release – Mixture*	Release Direct to Atmosphere
Waste Gas Decay Tank	Aux Bldg	Monitored Release – Mixture*	Release Direct to Atmosphere
		Effluent Isotopic Release Conc	
		Effluent Isotopic Release Rate	

\* Monitored Release – Mixture is the preferred option if the release is monitored

**ATTACHMENT 6**  
**Sheet 3 of 10**  
**Crystal River Specific Actions and Parameters**

**3.0 Site Boundary (0.83 miles) Dose Estimate Credibility Evaluation**

Dose estimates in the first hour of a release may be compared with estimates in this table as a credibility check; however, actual dose rates could vary by orders of magnitude depending on plant conditions. Row 1 for extended shutdown conditions, all other rows for on-line conditions.

Monitor Reading or Accident Type	Type of Source Term Estimate	Notes	Thyroid mR per one hour	TEDE mR per one hour	Gas Ci/sec	Iodine Ci/sec
<b>Extended Shutdown:</b> RM-A2 Accident Range at 10 Ci/sec (0.45 $\mu$ Ci/cc)	RASCAL ST	12	730	1000		
<b>RM-A1 Accident Range</b> at 1 Ci/sec (4.3E-2 $\mu$ Ci/cc)	Worksht ST	1, 3	2.6	1.8		
<b>RM-A2 Accident Range</b> at 1 Ci/sec (1.4E-2 $\mu$ Ci/cc)	Worksht ST	1, 3	2.6	1.8		
<b>RM-G29/30</b> at 100 R/hr	Worksht ST	3, 4	280	12		
	RASCAL ST	2, 4	12	0.6		
<b>LOCAN</b> <u>NO</u> Core Damage	CR3 Default	3, 5	< 0.1	< 0.1	1.0E-5	1.0E-7
	RASCAL ST	6	0.2	0.5		
<b>LOCAG</b> Clad Failure	CR3 Default	3, 5	15	1.8	0.7	0.01
	RASCAL ST	7	770	38		
<b>LOCAC</b> Fuel Melting	CR3 Default	3, 5	130	29	14	0.086
	RASCAL ST	7	6300	350		
<b>WGDTR</b>	CR3 Default	3, 5	9	0.1	5.4	4.2E-5
<b>FHA</b>	CR3 Default	3, 5	11	110	68	6.7E-3
	RASCAL ST	8	< 0.1	0.1		
<b>SGTRN</b> <u>NO</u> Core Damage	CR3 Default	3, 5	24	1	0.016	0.016
	RASCAL ST	9	< 0.1	< 0.1		
	Typical RCS	10	< 0.1	< 0.1		
<b>SGTRG</b> Clad Failure	CR3 Default	3, 5, 11	2.7E5	1.3E4	1100	180
	RASCAL ST	9	100	5		
<b>SGTRC</b> Fuel Melt	CR3 Default	3, 5, 11	2.1E6	1.2E5	2.2E4	1400
	RASCAL ST	9	730	42		



**ATTACHMENT 6**  
**Sheet 4 of 10**  
**Crystal River Specific Actions and Parameters**

**3.0 Continued**

Standard Assumptions:

RASCAL model, NO holdup time, release height 0, building wake Yes, E stability class, 1 m/sec wind, NO rain, RB cfm=50,000; AB cfm=156,000

Assumption Notes From Table:

1. Base I/NG Ratio=1, Iodine DFs: Partitioning=1, Plateout=3, Sprays=10, Filters=20  
Base P/NG Ratio=0.1, Particulate DFs: Partitioning=1, Plateout=10, Sprays=10, Filters=100
2. RASCAL options: Containment Radiation Monitor, Containment Leakage/Failure
3. RASCAL options: Monitored Release – Mixtures, Release Direct to Atmosphere. The site boundary doses for RM-A1 and RM-A2 are equal because both monitors are assumed at 1 Ci/sec. However, because of the higher flow rate on RM-A2, less  $\mu\text{Ci/cc}$  is required to achieve 1 Ci/sec.
4. 30 psig, 1 square inch hole, spray off
5. 2001 default Ci/sec calculations were used to derive total  $\mu\text{Ci/cc}$  and allocation percentages for noble gases and halogens.
6. RASCAL options: Ultimate Core Damage State, Containment Bypass, 100 gpm
7. RASCAL options: Ultimate Core Damage State, Containment Leakage/Failure, Design Basis Leakage
8. 1 assembly damaged, 1 month old, RASCAL options: Assembly Damaged Underwater, Release Direct Atmosphere, 100% / hr
9. RASCAL options: Ultimate Core Damage State, Steam Generator Tube Rupture, 100 gpm
10. RASCAL options: Coolant Sample (typical on-line concentrations), Steam Generator Tube Rupture, 100 gpm
11. There is a huge disparity between the CR3 default doses and doses derived using the standard RASCAL source terms. The RASCAL source terms should be considered more credible. The CR3 default doses should be viewed as the upper limit doses bounding a SGTR event with core damage.
12. The TEDE dose is the EM-202 EAL 1.4 Protective Action Guideline (PAG) threshold value for extended shutdown conditions as documented in Calculation N12-0001.

**ATTACHMENT 6**  
**Sheet 5 of 10**  
**Crystal River Specific Actions and Parameters**

**4.0 METEOROLOGICAL DATA INPUT SHEET**

DATE/TIME OF TRIP: \_\_\_\_\_ DATE/TIME OF RELEASE: \_\_\_\_\_

Sources listed by priority – enter number of source data used in each column heading

1. 33ft Primary Tower
2. 175ft Primary Tower
3. 33ft Alternate Tower
4. Other \_\_\_\_\_

**METEOROLOGICAL DATA**

Rec	Obs Or Fcst	Date	Data Time	Wind Direction From Deg	Wind Speed mph	Sigma Theta Deg or Wind Range Deg or Delta T Deg F	Stability Class	Rain Inches Per 15 min	Air Temp Deg F

**ATTACHMENT 6**  
**Sheet 6 of 10**  
**Crystal River Specific Actions and Parameters**

**5.0 RADIOLOGICAL DATA SHEET**

Projection Number	Date	Data Time	Accident Type	Release Start Time	Release Stop Time	Release Flow Rate CFM/GPM	Gas µCi/cc	Iodine µCi/cc	Release Filtered Yes/No	Sprays On/Off



**ATTACHMENT 6**  
**Sheet 7 of 10**  
**Crystal River Specific Actions and Parameters**

**6.0 ALTERNATE METHODS FOR DETERMINING METEOROLOGICAL DATA:** The following steps are **OPTIONAL** and may be used as needed to obtain data.

**6.1 ESTIMATE** wind direction, wind speed, and wind range **BY OBSERVING** cooling tower vapor, flags, fossil stack smoke, etc.

**6.2 DETERMINE** Stability class by using Sigma Theta (preferred), Delta T, or wind range. Wind range is the difference (in degrees) between the highest and lowest wind direction tracing on the recorder for a 15 minute period.

SIGMA THETA (degrees)	DELTA T (DEGREES)	WIND RANGE (degrees)	STABILITY CLASS
$\geq 22.5$	$\leq -1.46$	$\geq 135$	A (most dispersed plume)
< 22.5 to 17.5	-1.45 to -1.31	134 to 105	B
< 17.5 to 12.5	-1.30 to -1.16	104 to 75	C
< 12.5 to 7.5	-1.15 to -0.39	74 to 45	D
< 7.5 to 3.8	-0.38 to 1.15	44 to 23	E
< 3.8 to 2.1	1.16 to 3.07	22 to 13	F
< 2.1	$\geq 3.08$	$\leq 12$	G (most concentrated plume)

**6.3 DETERMINE** wind direction by estimating the average value of the tracing for a 15 minute period.

**6.4 OBTAIN** weather data via the intra/internet by **CHOOSING** sites as required listed below.

6.4.1 **GO TO** AccuWeather.com. **ENTER** zip code 34428 **AND** hour-by-hour.

6.4.2 **GO TO** Weather.com. **ENTER** zip code 34428 **AND** select hourly.

6.4.3 **GO TO** Energy Control Center: Progress Net, Business Units and Departments, Energy Control Center Florida, Forecasts, Real Time Weather, Zone City Forecasts, **THEN CLICK** west central Florida area on map.

**ATTACHMENT 6**  
**Sheet 8 of 10**  
**Crystal River Specific Actions and Parameters**

**6.5 OBTAIN** meteorological data from the following sources if desired, however, non-local backup sources may NOT be representative. Phone numbers are in the Off-site Support Directory.

- Primary Backup - FAA Flight Service Station in Gainesville, FL.
- Secondary Backup - Tampa Weather Service in Ruskin, FL.

**6.6 REFER** to the following table to **DETERMINE** sectors affected based on the wind from direction.

<u>DEGREES</u>	<u>SECTORS</u>		<u>DEGREES</u>	<u>SECTORS</u>		<u>DEGREES</u>	<u>SECTORS</u>
349-11 (349-371)	H J K		102-123 (462-483)	N P Q		214-236	B C D
12-33 (372-393)	J K L		124-146 (484-506)	P Q R		237-258	C D E
34-56 (394-416)	K L M		147-168 (507-528)	Q R A		259-281	D E F
57-78 (417-438)	L M N		169-191 (529-540)	R A B		282-303	E F G
79-101 (439-461)	M N P		192-213	A B C		304-326	F G H
						327-348	G H J

## **7.0 METHODS FOR DETERMINING CORE DAMAGE**

This section lists three methods of selecting accident type based on the level of core damage. Each method has advantages and disadvantages. Use the most appropriate method (or combination) to predict the level of core damage. Methods are:

- Based on RM-G29 and RM-G30 readings
- Based on Iodine ratio
- Based on RCS pressure and temperature

**ATTACHMENT 6**  
**Sheet 9 of 10**  
**Crystal River Specific Actions and Parameters**

**7.1 DETERMINE BASED ON RM-G29 AND RM-G30**

**NOTE:** This method can be performed quickly, but requires a breach of the Reactor Coolant System. The monitor readings assume thorough mixing of the Reactor Building atmosphere which may take several hours. Earlier readings will likely be higher (conservative).

**7.1.1 OBTAIN RM-G29 and RM-G30 readings.**

- **IGNORE** spikes **AND ESTIMATE** the sustained monitor reading.
- **DETERMINE** accident type using the estimated value and the following data:

<u>RM-G29/30 R/HR</u>	<u>ACCIDENT TYPE</u>
<100	Normal Coolant
100 - 25000 WITH RB SPRAY	Gas Gap Damage
100 - 75000 WITHOUT RB SPRAY	Gas Gap Damage
>25000 WITH RB SPRAY	Core Melt
>75000 WITHOUT RB SPRAY	Core Melt

**7.2 DETERMINE BASED ON IODINE RATIOS.**

**NOTE:** This method requires a gamma isotopic of a grab sample, which must be performed offsite.

There is NO way to distinguish between a gap release and a core melt release using iodine ratios.

**7.2.1 ANALYZE** a liquid or gas sample representative of the post-accident source term.

**7.2.2 DETERMINE** the ratio of I-131 to Total Iodine.

- **IF** I-131/Total Iodine is < 0.05 **THEN ASSUME** LOCAN or SGTRN.
- **IF** I-131/Total Iodine is  $\geq$  0.05 **THEN ASSUME** LOCAG or SGTRG.

**ATTACHMENT 6**  
**Sheet 10 of 10**  
**Crystal River Specific Actions and Parameters**

**7.3 DETERMINE BASED ON RCS PRESSURE AND TEMPERATURE**

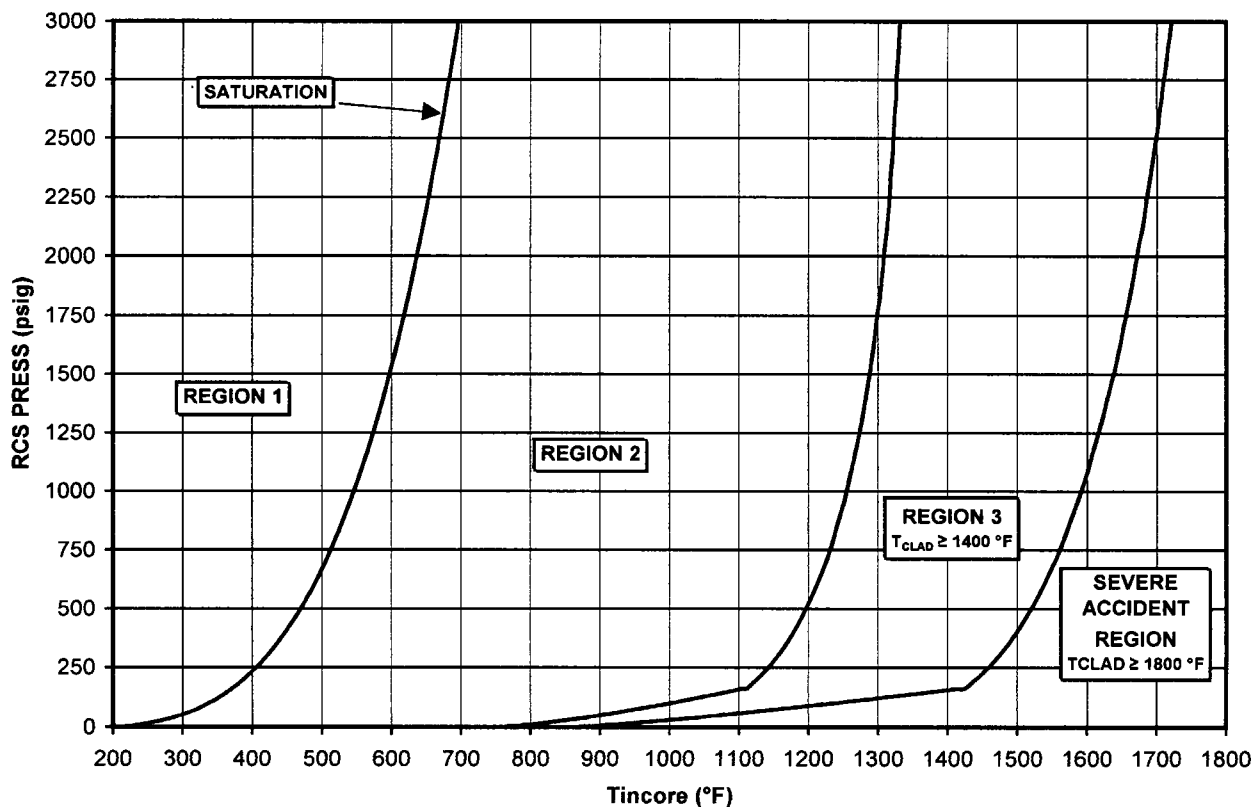
**NOTE:** This method can be performed quickly, but will NOT indicate mechanically-induced core damage. The intersection of pressure from the Y axis and temperature from the X axis is the level of core damage. (Regions are from the Inadequate Core.)

7.3.1 **LOCATE** the region on the graph where the RCS Pressure (psig) and the T<sub>incore</sub> (degrees F) intersect.

7.3.2 **IF** intersection is Region 1 **OR** Region 2 **THEN** NO fuel damage exists. RCS activity is considered normal.

7.3.3 **IF** intersection is Region 3 **THEN** possible gas gap failure exists.

7.3.4 **IF** intersection is Severe Accident Region **THEN** possible core melt exists.



**ATTACHMENT 7**  
**Sheet 1 of 1**  
**H.B. Robinson Specific Actions and Parameters**

**1.0 H.B. Robinson Default Data**

<b>Average reactor power MW(th)</b>	2339	<b>Coolant volume (gal)</b>	4.468E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	30000
<b>Number of assemblies in core</b>	157	<b>Containment volume (ft<sup>3</sup>)</b>	2.100E+06	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	50000

**2.0 Release Height Parameters**

**USE** the following height for radiological release points to the environment:

- Plant Vent Stack: 62 meters (203 feet)
- Other non-vent stack releases: 11 meters (36 feet)

Thirty-six (36) feet is equivalent to the ground level sensors at eleven (11) meters on the site meteorological tower.

**3.0 Meteorological Data**

- 3.1 **OBTAIN** met data from the appropriate source (OSI/PI, ERFIS, National Weather Service, Weather Services International (WSI), etc.).
- 3.2 **IF** a weather agency provides a written weather report, Attachment 3 provides information for weather report symbols. The minimum met data required for dose projection model is wind speed and direction.
- 3.3 **IF** OSI/PI and ERFIS are unavailable **THEN REFER** to EPRAD-03 for further guidance to obtain meteorological data.

**ATTACHMENT 8**  
**Sheet 1 of 16**  
**Shearon Harris Specific Actions and Parameters**

This attachment contains the following sections:

- 1.0 Shearon Harris Default Data – Sheet 1
- 2.0 Effective Release Heights – Sheet 1
- 3.0 Meteorological Data – Sheet 2
- 4.0 Calculate Dose Equivalent Activity – Sheet 7
- 5.0 HNP Source Term Type Selection Guide – Sheet 11

**1.0 Shearon Harris Default Data**

- 1.1 Following R17, when comparing RASCAL results with other agencies, it will be important to communicate the changes from the default values in the plant parameter table.
- 1.2 Following R17, **VERIFY** that the HNP Plant Parameters match the value in the following table, **IF** not **THEN** adjust to those values

Average reactor power MW(th)	2948*	Coolant volume (gal)	7.710E+04	Avg. fuel burnup- MWD/MTU (in reactor)	39,870**
Number of assemblies in core	157	Containment volume (ft <sup>3</sup> )	2.344E+06	Avg. fuel burnup- MWD/MTU (in spent fuel storage)	59,800**

\*From EC 74914 IMPLEMENT LICENSE CHANGE FOR THE MUR UPRATE, B.1.2 Table 1

\*\*From EC75840 HNP CYCLE 18 CORE DESIGN AND SAFETY ANALYSIS, Table B.1: Cycle 18 Neutronics Results. Avg. Fuel burnup (in reactor) parameter is based upon two-thirds of the EC 75840 value per NUREG 1887 Section 1.1.6

**2.0 Effective Release Heights** (enter the release height of the release point)

- 2.1 Use the following height for stack releases.

- Stack 1 (RAB & FHB) 27.4 meters (90 feet)
- Stack 3 (TB) 19.2 meters (63 feet)
- Stack 5 (WPB) 24.1 meters (79 feet)
- Stack 5A (WPB) 18.3 meters (60 feet)

## ATTACHMENT 8

### Sheet 2 of 16

#### Shearon Harris Specific Actions and Parameters

2.2 Use the following height for non-stack releases.

- Steam dumps 18.3 meters (60 feet)
- PORVs 14.9 meters (49 feet)
- Main Steam Safeties 15.9 meters (52 feet)
- CVPETS (TB Stack) 19.2 meters (63 feet)

2.3 If the release is not from one of the fixed sources noted above, then enter the actual height of the release point.

### 3.0 Meteorological Data

3.1 **OBTAIN** met data from the appropriate source (OSI/PI, ERFIS, National Weather Service, Weather Services International (WSI), etc.). For guidance on obtaining data from ERFIS, see the EP Training Module EP-08, ERFIS located at: <http://nggweb/hnppassportdm/Mgen/EP-MODULEEP08.pdf>

**NOTE:** All release points at HNP are considered to be a ground level release due to the stack height being less than 2.5 times the height of any surrounding building. Therefore, the 12.5 m wind direction and speeds are used as input into the meteorological data.

3.2 The HNP Site Meteorological Data inputs from ERFIS are:

- a. Wind Direction (from) in degrees (ERFIS ID MMT1014 Avg. Wind Direction @ 12.5 m)
- b. Speed (mph) (ERFIS ID MMT1008 Avg. Wind Speed @ 12.5 m)

3.3 **IF** a weather agency provides a written weather report, Attachment 3 provides information for weather report symbols. The minimum met data required for dose projection model is wind speed and direction.

3.4 The default data set for HNP is HARR – Shearon Harris. Other data sets based on met data monitoring locations applicable for performing complex calculations are:

- BUY – Burlington
- FAY – Fayetteville
- HARR – Shearon Harris (Default)
- GSO – Greensboro
- IGX – Chapel Hill
- MEB - Maxton
- RDU – Raleigh-Durham

3.5 **IF** OSI/PI and ERFIS are unavailable **THEN ACCESS** met data via modem connection.

**ATTACHMENT 8**  
**Sheet 3 of 16**  
**Shearon Harris Specific Actions and Parameters**

**CAUTION**

For cyber security reasons, the phone line connection at the modem must only be connected while the EOF is activated.

- 3.5.1 **CONNECT** phone line to the modem.
- 3.5.2 **SELECT** mettower.
- 3.5.3 **WAIT** for Windows to display the CONNECT TO box.
- 3.5.4 **SELECT** OK.
- 3.5.5 **WAIT** for Windows to display the CONNECT box.
- 3.5.6 **SELECT** the DIAL.
- 3.5.7 **WAIT** for the HyperTerminal screen to be displayed. The display will have a clear screen.
- 3.5.8 **VERIFY** the Caps Lock is off **OTHERWISE** turn the Caps Lock off.
- 3.5.9 **TYPE** in "u" **THEN CLICK** the Enter key. The "u" will NOT be seen but the following display will appear.

**USER MENU**

- |                                  |                              |
|----------------------------------|------------------------------|
| <b>(C)</b> Communications Menu   | <b>(T)</b> Test Menu         |
| <b>(F)</b> System Functions Menu | <b>(Z)</b> Zeno Program Menu |
| <b>(S)</b> Sample Period Menu    | <b>(Q)</b> Quit              |
| <b>(D)</b> Data Retrieval Menu   | <b>(H)</b> Help              |



**ATTACHMENT 8**  
**Sheet 4 of 16**  
**Shearon Harris Specific Actions and Parameters**

3.5.10 **TYPE** in "d" **THEN CLICK** the Enter key. The following display will appear.

**DATA RETRIEVAL MENU**

- |  |                                     |
|--|-------------------------------------|
| <b>(A)</b> Show Records AFTER Specified Time | <b>(F)</b> Flash Memory Information |
| <b>(B)</b> Show Records BETWEEN Timespan     | <b>(D)</b> Delete All Data Records  |
| <b>(Ln)</b> Show LAST n Records<br>Logged    | <b>(N)</b> Number Of Records        |
| <b>(*)</b> Show ALL Data Records             | <b>(U)</b> User Menu                |
| <b>(@n)</b> Show n Unmarked Records          | <b>(Q)</b> Quit                     |
| <b>(M)</b> Mark Recently Shown Data          | <b>(H)</b> Help                     |
| <b>(C)</b> Compute Data Logging Capacity     |                                     |

Precede Any "Show Data" Command With An 'X' For X-Modem Transfer

(e.g. Enter 'X\*' To Send All Data Sets Via X-Modem)

3.5.11 **TYPE** in l1 (NOTE: this is a small "l" and a "1") **THEN CLICK** the Enter key.  
The following display of the last 15-minute average Met data will appear.  
Sample display:

**NOTE:** Lines 2 and 3 below provide the data codes. Lines 4 and 5 provide the respective values. For example, the first value in line 2 (DATE) corresponds to the first value in line 4 (02/04/10), the third value in line 2 (AT\_11\_1\_av) corresponds to the third value in line 4 (63.57), etc. Each data code in lines 2 and 3 has a corresponding value in lines 4 and 5. The table on the next page explains the codes on lines 2 and 3.

Line 2 and Line 3 Code	Description	ERFIS ID
DATE	Date	N/A
TIME	Time	N/A
AT_11_1_av		
WSPD_61_av	Avg. Wind Speed @ 61.4 m	MMT1010
WVAR_61_av	Avg. Wind Direction Variance @ 61.4 m	MMT1012
WDIR_61_av	Avg. Wind Direction @ 61.4 m	MMT1013
WDIR_12_av	Avg. Wind Direction @ 12.5 m	MMT1014
WVAR_12_av	Avg. Wind Direction Variance @ 12.5 m	MMT1009
WSPD_12_av	Avg. Wind Speed @ 12.5 m	MMT1008
AT_60_1_av		
RH_11_av	Avg. Relative Humidity	MMT1018
DT_1_av	Avg. Delta Temperature 1 C/100 m	MMT1005
DT_2_av	Avg. Delta Temperature 2 C/100 m	MMT1004
RAIN	Precipitation, 15 min	MMT1003
BP_av	Avg. Barometric Pressure	MMT1002
SOLAR-av	Avg. Solar Radiation Langley/Min	MMT1001
DP-av	Avg. Dew Point. °F	MMT1000

**ATTACHMENT 8**  
**Sheet 6 of 16**  
**Shearon Harris Specific Actions and Parameters**

**DATA RETRIEVAL MENU**

- |  |                                     |
|--|-------------------------------------|
| <b>(A)</b> Show Records AFTER Specified Time | <b>(F)</b> Flash Memory Information |
| <b>(B)</b> Show Records BETWEEN Timespan     | <b>(D)</b> Delete All Data Records  |
| <b>(Ln)</b> Show LAST n Records              | <b>(N)</b> Number Of Records Logged |
| <b>(*)</b> Show ALL Data Records             | <b>(U)</b> User Menu                |
| <b>(@n)</b> Show n Unmarked Records          | <b>(Q)</b> Quit                     |
| <b>(M)</b> Mark Recently Shown Data          | <b>(H)</b> Help                     |
| <b>(C)</b> Compute Data Logging Capacity     |                                     |

Precede Any "Show Data" Command With An 'X' For X-Modem Transfer  
(e.g. Enter 'X\*' To Send All Data Sets Via X-Modem)

3.5.12 **TYPE** in "q" **THEN CLICK** the Enter key to quit the Met menu.

3.5.13 **SELECT** the CALL dropdown **AND THEN** the DISCONNECT option on the HyperTerminal Command Bar at the top to terminate the modem connection to the Met Tower.

3.5.14 **IF** there is an extended period of inactivity **THEN** the Met Tower processor will automatically terminate the User interface menu.

1. At this point data may be retrieved again by going to step 4.4.6 if this attachment.

3.5.15 **VERIFY** the phone line is disconnected at the modem when the EOF is deactivated.

3.6 **USE** the following ERFIS Points if needed for met data:

- Speed in mph – MMT1008
- Stability Class – MMT1017

3.7 **IF** OSI/PI and ERFIS are not available to provide the stability class **THEN** an alternate method that may be used is shown below.

3.7.1 **IF** only one ERFIS  $\Delta T$  channel is available (computer point MMT 1004 or MMT 1005), **THEN USE** the following table to determine the stability class.

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**Sheet 7 of 16**  
**Shearon Harris Specific Actions and Parameters**  
**Stability Classes**

$\Delta T$ in °C/100m	Class
$\leq -1.9^\circ$	A or 1
$> -1.9^\circ$ to $\leq -1.7^\circ$	B or 2
$> -1.7^\circ$ to $\leq -1.5^\circ$	C or 3
$> -1.5^\circ$ to $\leq -0.5^\circ$	D or 4
$> -0.5^\circ$ to $\leq +1.5^\circ$	E or 5
$> +1.5^\circ$ to $\leq +4.0^\circ$	F or 6
$> +4.0^\circ$	G or 7

3.7.2 IF the stability class is not available **THEN USE** the following table to choose the appropriate value:

Surface Wind Speed (mph)	Daytime Solar Radiation (For moderate cloud cover move one column to the right)			Nighttime Conditions		Day or Night
	Summer\ Clear Sky	Spring & Fall Clear Sky	Winter	Thin overcast ( $> 1/2$ cloud cover)	$< 3/8$ cloud cover	Heavy Overcast or Rain
$< 4.5$	A	A-B	B	E	F	D
$\geq 4.5$ to 9.0	A-B	B	C	E	F	D
$> 9.0$ to 13.5	B	B-C	C	D	E	D
$> 13.5$	C	C-D	D	D	D	D

**ATTACHMENT 8**  
**Sheet 8 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

IF requested **CALCULATE** Dose Equivalent Activity for noble gas, halogen and particulates using the following tables.

**4.1 CALCULATE Xe-133 (Noble Gas) Dose Equivalent.**

<b>Nuclide</b>	<b>Activity (Ci)</b>	<b>X</b>	<b><math>\frac{DCF_i}{DCF_{Xe-133}}</math></b>	<b>=</b>	<b>Xe-133 Equivalent</b>
Kr-85		X	6.5E-02	=	
Kr-85m		X	4.7E+00	=	
Kr-87		X	2.6E+01	=	
Kr-88		X	6.5E+01	=	
Xe-131m		X	2.5E-01	=	
Xe-133		X	1.0E+00	=	
Xe-133m		X	8.5E-01	=	
Xe-135		X	7.0E+00	=	
Xe-135m		X	1.3E+01	=	
Xe-138		X	3.6E+01	=	
				•	

**4.2 CALCULATE I-131 (Halogen) Dose Equivalent.**

<b>Nuclide</b>	<b>Activity (Ci)</b>	<b>X</b>	<b><math>\frac{DCF_i}{DCF_{I-131}}</math></b>	<b>=</b>	<b>I-131 Equivalent</b>
I-131		X	1.0E+00	=	
I-132		X	5.9E-03	=	
I-133		X	1.7E-01	=	
I-134		X	1.0E-03	=	
I-135		X	2.9E-02	=	
				•	

**ATTACHMENT 8**  
**Sheet 9 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

**4.3 CALCULATE Cs-137 (Particulate) Dose Equivalent.**

<b>Nuclide</b>	<b>Activity (Ci)</b>	<b>X</b>	<b><math>\frac{DCF_i}{DCF_{Cs-137}}</math></b>	<b>=</b>	<b>Xe-133 Equivalent</b>
Cs-134		X	1.5E+00	=	
Cs-136		X	4.4E-01	=	
Cs-137		X	1.0E+00	=	
Sb-127		X	2.3E-01	=	
Sb-129		X	4.9E-02	=	
Te-129m		X	7.1E-01	=	
Te-131m		X	2.1E-01	=	
Te-132		X	2.9E-01	=	
Sr-89		X	1.2E+00	=	
Sr-90		X	3.9E+01	=	
Sr-91		X	5.9E-02	=	
Ba-140		X	1.3E-01	=	
Mo-99		X	1.3E-01	=	
Ru-103		X	3.2E-01	=	
Y-91		X	1.4E+00	=	
La-140		X	2.7E-01	=	
				•	

**ATTACHMENT 8**  
**Sheet 10 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

4.4 The following table and calculations provide insight for the Dose Equivalent activities calculated above.

**NOTE:** The Dose Conversion Factors (DCF) in the following equations are taken from Tables 5-1 and 5-2 of EPA 400-92-01, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents. The DCFs for the Xe-133 noble gas equivalent and the Cs-137 particulate equivalent are combined exposure pathway DCFs from Table 5-1. The DCFs for the I-131 halogen equivalent are from Table 5-2.

**Dose Conversion Factors mrem (DCF<sub>i</sub>)**

Isotope	DCF	Isotope	DCF	Isotope	DCF
Kr-85	1.3E+00	I-133	2.2E+05	Sr-89	5.0E+04
Kr-85m	9.3E+01	I-134	1.3E+03	Sr-90	1.6E+06
Kr-87	5.1E+02	I-135	3.8E+04	Sr-91	2.4E+03
Kr-88	1.3E+03	Cs-134	6.3E+04	Ba-140	5.3E+03
Xe-131m	4.9E+00	Cs-136	1.8E+04	Mo-99	5.2E+03
Xe-133	2.0E+01	Cs-137	4.1E+04	Ru-103	1.3E+04
Xe-133m	1.7E+01	Sb-127	9.5E+03	Y-91	5.9E+04
Xe-135	1.4E+02	Sb-129	2.0E+03	La-140	1.1E+04
Xe-135m	2.5E+02	Te-129m	2.9E+04		
Xe-138	7.2E+02	Te-131m	8.6E+03		
I-131	1.3E+06	Te-132	1.2E+04		
I-132	7.7E+03				

Equivalent activities are derived by the summation of multiplying the activity of the isotope times the ratio of the DCF for each isotope to the target isotope. Formulas for determining equivalent values are:

**ATTACHMENT 8**  
**Sheet 11 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

4.5 The following table and calculations provide insight for the Dose Equivalent activities calculated above. (Continued)

**Xe-133 equivalent (Noble Gases)**

$$Xe^{133}_{TEDE} = \sum \frac{A_i x DCF_i}{DCF_{Xe-133}}$$

Where:  $A_i$  = Activity of the isotope.

$DCF_i$  = DCF of the isotope.

$DCF_{Xe-133}$  = DCF for  $Xe^{133}$

**I-131 Equivalent (Halogens)**

$$I^{131}_{CDE} = \sum \frac{A_i x DCF_i}{DCF_{I-131}}$$

Where:  $A_i$  = Activity of the isotope.

$DCF_i$  = DCF of the isotope.

$DCF_{I-131}$  = DCF for  $I^{131}$

**Cs-137 equivalent (Particulates)**

$$Cs^{137}_{TEDE} = \sum \frac{A_i x DCF_i}{DCF_{Cs-137}}$$

Where:  $A_i$  = Activity of the isotope.

$DCF_i$  = DCF of the isotope.

$DCF_{Cs-137}$  = DCF for  $Cs^{137}$



**ATTACHMENT 8**  
**Sheet 12 of 16**  
**Shearon Harris Specific Actions and Parameters**

**5.0 HNP Source Term Type Selection Guide**

This table lists all the source term types available for HNP accidents, guidance on when to use each type and the source terms available and where to obtain the required data for RASCAL inputs.

Source Term Type	When Used	Source Data Needed	Obtain From	Available Release Paths Data	Obtain From
<b>Time Core Uncovered</b> (Procedure Step 9.6.1)	Use when you can estimate how long the core will be uncovered and you want RASCAL to estimate the core damage that will result. Catastrophic event/release.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Reactor Shutdown? Date/Time  Core Uncovered? Date/Time  Core Recovered? Date/Time	EOF SRO  EOF SRO  EOF SRO	Containment leakage/failure (RCB Leak Rate by percent volume or RCB pressure/hole size)  Steam generator tube rupture by # of ruptured tubes or by charging flow  Containment bypass (RCS leak rate into RAB; Filters – Yes if building normal filtered or emergency filtered exhaust systems are operating)  Not an Isolated Stack Release Height	EOF AAT  EOF AAT EOF SRO/ERFIS  EOF SRO  Attachment 8 Section 2.0
<b>Ultimate Core Damage State</b> (Procedure Step 9.6.2)	Use this option when you believe you can make a valid estimate of the amount of core damage that has occurred. It can also be used for "what if" analyses.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Reactor Shutdown? Date/Time  Core Damage state No damage Fuel pin leakage Cladding failure  Time/Date coolant release	EOF SRO  EOF AAT  EOF AAT	Steam generator tube rupture by # of ruptured tubes or by charging flow  Containment bypass (RCS leak rate into RAB; Filters – Yes if building normal filtered or emergency filtered exhaust systems are operating)  Not an Isolated Stack Release Height	EOF AAT EOF SRO/ERFIS  EOF SRO  Attachment 8 Section 2.0

**ATTACHMENT 8**  
**Sheet 13 of 16**  
**Shearon Harris Specific Actions and Parameters**

<b>Containment Radiation Monitor</b> (Procedure Step 9.6.3)	Use containment radiation monitor when you have readings from the containment monitor, you want the code to estimate the core damage from the readings.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Reactor Shutdown? Date/Time Core Uncovered? Date/Time  Containment Monitor Reading/Date/Time (RM-01CR-3589-SA/SB)	EOF SRO   ERFIS/ MCR HP- RMS Tech	Containment leakage/failure (RCB Leak Rate by percent volume or RCB pressure/hole size)  Not an Isolated Stack Release Height	EOF AAT  Attachment 8 Section 2.0
<b>Coolant Sample</b> (Procedure Step 9.6.4)	Use coolant sample when you know the coolant activity and coolant will be released to the atmosphere.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Sample ID Date/Time  Activity (Isotopic – verify units Chemistry reports in $\mu\text{Ci/ml}$ )	OSC Chemistry Coord.  OSC Chemistry Coord.	Steam generator tube rupture by # of ruptured tubes or by charging flow  Containment bypass (RCS leak rate into RAB; Filters – Yes if building normal filtered or emergency filtered exhaust systems are operating)  Not an Isolated Stack Release Height	EOF AAT EOF SRO/ERFIS  EOF SRO  Attachment 8 Section 2.0

**ATTACHMENT 8**  
**Sheet 14 of 16**  
**Shearon Harris Specific Actions and Parameters**

<b>Containment Air Sample</b> (Procedure Step 9.6.5)	Use air sample when you know the activity in the containment air and it will be released to the atmosphere via Containment leakage or failure.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Sample ID Date/Time  Activity (Isotopic – verify units Chemistry reports in $\mu\text{Ci/ml}$ )	OSC Chemistry Coord.  OSC Chemistry Coord.	Containment leakage/failure (RCB Leak Rate by percent volume or RCB pressure/hole size)  Not an Isolated Stack Release Height	EOF AAT  Attachment 8 Section 2.0
<b>Effluent Isotopic Release Rates</b> (Procedure Step 9.6.6)	Use the effluent rate when the release is through a sampled pathway that allows determination of the release rate of nuclides in terms of activity per unit time.	Release Location Release Period(s) Date/Time Activity (Isotopic)/unit time (Need to calculate release rate: $A(\mu\text{Ci/ml}) \times F(\text{ft}^3/\text{min}) \times 4.7\text{E}(-4) = R (\text{Ci/sec})$  Isotopic Activity – Plant Vent Stack, TB or WPB Vent Stack Air Sample - verify units Chemistry reports in $\mu\text{Ci/ml}$  Flow Rate - Plant Vent Stack, TB or WPB Vent Stack Process Flow Rate - verify units plant data in $\text{ft}^3/\text{min}$	ERFIS/ MCR HP- RMS Tech  OSC Chemistry Coord.  EOF SRO/ MCR HP- RMS Tech	Release direct to atmosphere  Not an Isolated Stack Release Height	Attachment 8 Section 2.0

**ATTACHMENT 8**  
**Sheet 15 of 16**  
**Shearon Harris Specific Actions and Parameters**

<b>Effluent Isotopic Release Concentrations</b> (Procedure Step 9.6.7)	Use the effluent concentration when the release is through a sampled pathway that allows determination of the release flow rate and the concentrations of nuclides in terms of activity per unit volume.	Release Location Release Period(s) Date/Time Isotopic Activity – Plant Vent Stack, TB or WPB Vent Stack Air Sample - verify units Chemistry reports in $\mu\text{Ci/ml}$ ) Flow Rate – WRGM Eff. Channel Plant Vent Stack 3509-1,; WPB Stack 5 3546-1; WPB Stack 5A 3547-1; or TB Stack 3 3536-1 Process Flow Rate - verify units plant data in $\text{ft}^3/\text{min}$	ERFIS/ MCR HP- RMS Tech  OSC Chemistry Coord.  EOF SRO/ MCR HP- RMS Tech	Release direct to atmosphere  Not an Isolated Stack Release Height	Attachment 8 Section 2.0
<b>Monitored Releases – Mixtures</b> (Site specific procedure)	Use the gross concentration method when you know the concentration of the activity being released, but you do not know the composition by nuclide. Site procedures provide the method to calculate release rates (Ci/sec) for noble gases, iodines and particulates using radiation monitor and flow rate information.	See Procedure PEP-344 for data needed		See Procedure PEP-344 for data needed	
<b>Pool Storage – Uncovered Fuel</b> (Procedure step 9.8.1)	Use this source term when fuel is exposed above the water.	Density of fuel pool racking Number or batches of assemblies irradiated within 1,2 and 3 years  Fuel uncovered? Date/Time Pool totally drained? Yes/No Fuel recovered? Yes/No	EOF AAT   EOF SRO	Spent fuel release pathway  Not an Isolated Stack Release Height  Filtered if E12 or E13 is operating	Attachment 8 Section 2.0  EOF SRO

**ATTACHMENT 8**  
**Sheet 16 of 16**  
**Shearon Harris Specific Actions and Parameters**

<b>Pool Storage – Damaged Assembly Underwater</b> (Procedure step 9.8.2)	Use this source term when there are damaged assemblies underwater.	Number of damaged assemblies Age of damaged assemblies or how long damaged assemblies have been in storage When damage occurred – Date/Time	EOF AAT	Spent fuel release pathway  Not an Isolated Stack Release Height  Filtered if E12 or E13 is operating	Attachment 8 Section 2.0  EOF SRO
<b>Dry Storage – Cask Release</b> (procedure step 9.8.3)	Use this source term when there are damaged assemblies in a cask.	Not applicable to HNP		Not applicable to HNP	

## SUMMARY OF CHANGES

PRR 6176154

SECTION/STEP	CHANGES
3.5.2, Old 9.1.3, 9.1.2	Removed program location description for WIN7 implementation. (Editorial)

**Enclosure 2b**  
**EMG-NGGC-0002,**  
***Off-site Dose Assessment,***  
**Revision 6**

NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

**EMG-NGGC-0002**

***OFF-SITE DOSE ASSESSMENT***

REVISION 6



**NGG** Nuclear  
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## **1.0 PURPOSE**

- 1.1** The purpose of this procedure is to provide Nuclear Generation Group (NGG) guidance for performing offsite radiological dose assessments from the Technical Support Center or Emergency Operations Facility. This procedure is not for offsite dose assessment by on-shift Control Room Staff.
- 1.2** This procedure is to be used in conjunction with Radiological Assessment System for Consequence Analysis (RASCAL) Version 3.0.5 software during a declared plant emergency involving a release or potential release of airborne radioactive materials to the environment. This procedure should be used for all RASCAL Source Term Options except for Monitored Releases – Mixtures. For monitored releases, the use of RASCAL is described in site procedures as listed in References 2.2.7 through 2.2.10.
- 1.3** This procedure describes an adequate method for assessing actual or potential offsite consequences of a radiological emergency condition as delineated in 10CFR50.47(b)(9).
- 1.4** This procedure is an emergency plan implementing procedure. Any revisions must be carefully considered for emergency plan impact.

## **2.0 REFERENCES**

### **2.1 Developmental**

- 2.1.1** EPA 400 R-92-001, Manual of Protective Action Guides and Protective Actions For Nuclear Incidents
- 2.1.2** NUREG/BR-0150, Volume 1, Revision 4, RTM-96 Response Technical Manual
- 2.1.3** U.S. Department of Health, Education, and Welfare, Radiological Health Handbook, 1970
- 2.1.4** Crystal River NOCS 00387, Method for Transmitting and Radiological Data to the TSC and EOF
- 2.1.5** Crystal River NOCS 40188, Instructions for Accessing Meteorological and Radiological Data to the TSC and EOF
- 2.1.6** R-RP-11-01-F1F - Radiation Protection and Emergency Preparedness personnel have not effectively implemented actions to improve accuracy or timeliness of emergency plan dose projections (NCR 481263)

## **2.2 Implementing**

2.2.1 NUREG-1887, RASCAL 3.0.5: Description of Models and Methods

2.2.2 NUREG-1889, RASCAL 3.0.5 Workbook

2.2.3 Crystal River Nuclear Plant Final Safety Analysis Report (FSAR)

2.2.4 CR-3, Radiological Emergency Response Plan (RERP)

2.2.5 Harris Nuclear Plant FSAR Table 9.4.0-2

2.2.6 Crystal River Engineering Evaluation EEF-00-009, Revision 1 – Radiation Monitor Response Factors

2.2.7 EPRAD-03, H.B. Robinson Steam Electric Plant Dose Projections

2.2.8 PEP-344, HNP Offsite Dose Assessment Based on Monitored Releases

2.2.9 EM-204B, Offsite Dose Assessment During Radiological Emergencies for Monitored Releases – Mixtures (CR3)

2.2.10 OPEP-03.4.8, Brunswick Nuclear Plant Offsite Dose Estimates Based on Monitored Releases

2.2.11 CSP-NGGC-2505, Software Quality Assurance and Configuration Control of Business Computer Systems

## **3.0 DEFINITIONS**

### **3.1 Adverse Met Data**

The worst case meteorological conditions: G stability class and wind speed of 1.0 mph.

### **3.2 Committed Dose Equivalent**

Dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

### **3.3 Committed Effective Dose Equivalent**

Sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues.

### **3.0 DEFINITIONS (continued)**

#### **3.4 Core Melt**

Deformation of fuel pellet configuration due to excessive core temperature releasing large quantities of gaseous and particulate fission products.

#### **3.5 Decay Calculator**

The Decay Calculator (DecayCalc) computes radiological decay and daughter ingrowth. It computes the activity remaining after the decay time selected. It includes access to the RASCAL radionuclide database and has the ability to display decay chains as a table or as a graphic. DecayCalc is not linked to any other RASCAL module. Decay calculations are available within the STDose and FMDose models when appropriate. The same decay data and decay calculation routines are used throughout RASCAL.

#### **3.6 Deep Dose Equivalent**

External whole-body exposure at a tissue depth of 1 cm (1000 mg/cm<sup>2</sup>).

#### **3.7 Delta T**

Measurement of the difference in air temperature between two different elevations above ground level. The value provides a measure of the atmospheric stability.

#### **3.8 Depletion**

Reduction of the concentration of the plume (i.e., deposition and dispersion).

#### **3.9 Deposition**

Means of puff depletion that deposits particulate radioactive material on the ground.

#### **3.10 Derived Intervention Level (DIL)**

A value that corresponds to a health effect threshold or Protective Action Guideline (PAG). A DIL can be used to relate environmental measurements or laboratory analyses to the potential for health effects or the need for protective actions.

#### **3.11 Dose Equivalent**

Product of the absorbed dose in rad, a quality factor related to the biological effectiveness of the radiation involved and any other modifying factors. Units are typically in rem.

### **3.0 DEFINITIONS (continued)**

#### **3.12 Early Phase**

The period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required and must be based primarily on predictions of radiological conditions in the environment. This phase may last from hours to days. For the purposes of dose projections, it is assumed to last four (4) days.

#### **3.13 Effective Dose Equivalent**

The sum of the products of the dose equivalent to each organ and a weighting factor, where the weighting factor is the ratio of the risk of mortality from delayed health effects arising from irradiation of a particular organ or tissue to the total risk of mortality from delayed health effects when the whole body is irradiated uniformly to the same dose. This unit in Rem is considered equivalent to the Deep Dose Equivalent for the purposes of dose projections because the external exposures are considered to be uniform across the whole body.

#### **3.14 Field Measurement to Dose – (FMDose)**

The FMDose model computes emergency worker limits and early-phase and intermediate-phase doses and derived intervention levels (DILs) from the analyses of field measurements. The results of the analysis of field measurements may be entered directly in FMDose. All results are presented as tables. The intermediate-phase DILs are also presented graphically. FMDose includes access to the RASCAL radionuclide database and has the ability to display decay chains as a table or as a graphic.

#### **3.15 Gas Gap Failure**

Degradation of the protective cladding around the fuel pellets due to elevated core temperature releasing only radionuclides contained in the space between pellet and the cladding.

#### **3.16 Ground Surface Correction Factor**

The ground surface correction factor is used in the calculation of ground-shine dose. Its value may be from 0.1 to 1.0. It is used to reduce the dose due to the effects of scattering off uneven ground.

### **3.0 DEFINITONS (continued)**

#### **3.17 Intermediate Phase**

The period beginning after the incident source and releases have been brought under control and reliable environmental measurements are available for use as a basis for decisions on additional protective actions and extending until these protective actions are terminated. This phase may overlap the early and late phases and may last from weeks to many months. For the purpose of dose projection, it is assumed to last for one year.

#### **3.18 Late Phase**

The period beginning when recovery action designed to reduce radiation levels in the environment to permanently acceptable levels are commenced, and ending when all recovery actions have been completed. This period may extend from months to years (also referred to as the recovery phase).

#### **3.19 Meteorological Data Processor**

STDose module used for entering meteorological data and preparing the data for use by the atmospheric transport and diffusion models in RASCAL. Meteorological data for the site (release point) and 35 additional meteorological observation points may be entered and processed for use by the STDose models. The model is generally accessed directly from the STDose user interface. This method is common when supporting an event using real-time meteorology. The program may also be run stand alone, directly from Windows. This mode of operation is common when building predefined data sets.

#### **3.20 Partitioning**

Reduction of non-noble gases when the steam generator tube leak is below the water level of the generator. This is highly unlikely at CR3 because most of the tube length in a once-through steam generator is above the secondary level. This is not applicable to BNP.

#### **3.21 Release Duration**

Period of time from the beginning of the release until the end of the release or the projected end of the release. This can be determined by estimating the completion of a damage control mission, performance of a repair to stop the release, or the estimated time until the RCS, Containment Vessel Sump or Steam Generator temperature is below 200<sup>0</sup> F for a pressurized water reactor.

### **3.0 DEFINITIONS (continued)**

#### **3.22 Resuspension Factor**

The resuspension factor is used to calculate air concentrations from ground surface measurements. Its value may be from  $1 \text{ E-}11$  to  $1 \text{ E-}2$ . It is used in all intermediate-phase calculations and in early-phase calculations when measured air concentrations are not used (that is, when "Use Air" is not checked on the Enter Field Data form).

#### **3.23 Seabreeze Effect**

Wind circulation system produced when the land temperature is higher than the ocean temperature causing a lower level wind direction from sea to land. The consequence of a release traveling to sea and returning back to land can impact the projected dose in an upward factor. For BNP the seabreeze effect, if confirmed by a meteorologist, can exist between the  $16^{\circ}$  and  $269^{\circ}$  bearings.

#### **3.24 Sigma-Theta**

Standard deviation of a set of wind range measurements. The value provides a measure of atmospheric stability. The CR3 Sigma-Theta meter automatically calculates and displays the standard deviation of wind range for the previous 15 minutes.

#### **3.25 Source Term to Dose (STDose)**

The STDose of RASCAL provides estimates of the integrated doses and consequences resulting from the accidental release of radionuclides to the atmosphere. The model requires only information that might be available during an emergency. STDose should be used to assess the consequences of potential or ongoing releases. The program is used in conjunction with the Meteorological Data Processor Program.

#### **3.26 Spike Factor**

Rapid decrease in pressure of the primary system causes an increase in the rate at which the radioactive fission products in the fuel rod cladding gap escape into the coolant. The RASCAL default spiking factor of 100 is recommended initially and then adjusted after primary coolant analysis. This is not necessarily an indication of fuel damage.

#### **3.27 Stability Class**

Lettering system from A to G to designate certain atmospheric conditions which affect the dispersion of the plume. Class A indicates rapid dispersion, less concentrated plume (unstable conditions). Class G indicates slow dispersion, more concentrated plume (stable conditions).



### **3.0 DEFINITONS (continued)**

#### **3.28 Total Effective Dose Equivalent (TEDE)**

Early or plume phase TEDE that RASCAL calculates is the sum of the external gamma dose (cloudshine) from the plume, the committed effective dose equivalent (CEDE), and the external dose over a four-day period from radionuclides deposited on the ground (4-day groundshine dose).

#### **3.29 Weathering Factor**

The fraction of radioactivity remaining after being affected by average weather conditions for a specified period of time.

### **4.0 RESPONSIBILITIES**

#### **4.1 Dose Assessment/Projection Coordinator or Team Leader**

- 4.1.1 Calculate the TEDE and the thyroid CDE, of off-site dose consequences from a release of radioactivity.
- 4.1.2 Report dose projection results to the Radiological Control Manager (RCM) or Radiation Control Coordinator (RCC) /Radiological Control Director (RCD) if the EOF is not activated in a timely manner.
- 4.1.3 Communicate periodically with State and other agency dose assessment representatives to compare and contrast cases and results that were generated. A comparison also provides a means of peer checking input data and assumptions.

#### **4.2 Dose Assessment Team**

- 4.2.1 Implement the steps of this procedure to generate dose projections for review by the Dose Assessment/Projection Coordinator or Team Leader.
- 4.2.2 Solicit input from Accident Assessment personnel as needed for plant conditions.

#### **4.3 Accident Assessment Team**

- 4.3.1 Inform the Dose Assessment Team of plant conditions that may impact a radiological release to the environment such as time of core uncovered, percent fuel damage, etc.

## **5.0 PREREQUISITES**

- 5.1** Personnel performing RASCAL dose assessment during an emergency, drill, or exercise are trained and qualified per station procedures.

## **6.0 PRECAUTIONS AND LIMITATIONS**

- 6.1** If the release pathway is monitored, then the RASCAL Source Term Option for Monitored Releases – Mixtures is the preferred dose projection method. This method requires the use of site specific information and therefore the use of RASCAL for monitored releases is provided in site specific procedures (References 2.2.7 – 2.2.10). Exit this procedure and use the appropriate site procedure.
- 6.2** RASCAL requires stability class to be entered as an alphabetic value (e.g., A, B, C...). OSI/PI and ERFIS report stability class as a numeric value (e.g., 1, 2, 3...). They convert directly, 1=A, 2=B, 3=C, etc.
- 6.3** Several different input models should be run when data permits due to inherent uncertainties associated with generating dose projections using RASCAL. For example, when grab sample release data is available for a stack release, projections may be made using both a release rate model and release concentration model.
- 6.4** The release duration should be based on available information. If release duration information is not known, then use a default value of 1 hour (RNP should use 2 hours). The dose projections should be modified as more accurate information becomes available.
- 6.5** Meteorological conditions should be monitored approximately every 15 minutes for changes and RASCAL dose projections updated accordingly.
- 6.6** RASCAL dose projections should be updated accordingly when new data becomes available for plant, meteorological or event conditions.
- 6.7** Dose projections saved for various source terms may be re-opened and modified as necessary. The re-opened case should be renamed as applicable based on changes to event type, source term, release path, etc.
- 6.8** Consider radiation monitor operability and status prior to use for dose projections.
- 6.9** Sea breeze affect is NOT a specific calculation option for RASCAL; however, the meteorological program will model sea breeze if additional meteorological weather stations are used. Failure to consider the effects of a sea breeze on plume projections could result in large errors in both the projected plume location and intensity. Sea breeze is not a factor for HNP or RNP.

## **6.0 PRECAUTIONS AND LIMITATIONS (continued)**

- 6.10** BNP verification of ERFIS data shall be accomplished by comparing the Control Room readouts in the event the RMS/ERFIS interface multiplexer is in alarm.
- 6.11** CR3, RNP, and HNP normally uses the option of "Not an Isolated Stack" because the release points do NOT meet the height and separation distance requirements of an isolated release point
- 6.12** CR3 recorder AH-1003-TIR Channel 4 indicates total Reactor Building stack flow. AH-294-FT measures Reactor Building purge flow rate only and does NOT include make up flow.
- 6.13** CR3 instrumentation available during a station blackout includes:
- RM-Gs 1, 3, 5, 7, 9, 11, 25, 26, 27, 28, 29, 30
  - RM-Ls 2, 7
  - Primary Meteorological Tower local (at the tower only) readouts
  - RM-A1, RM-A2 control room display units are powered, but pumps, skids and detectors are NOT powered.
- 6.14** RNP specific: RASCAL uses effective release height to model mixed mode releases. A release height of two hundred three (203) feet should be chosen for releases through the plant vent stack. Two hundred three feet is equivalent to the elevated level sensors at sixty-two (62) meters on the site meteorological tower. A release height of 36 feet should be chosen for release points other than the plant vent stack. Thirty-six feet is equivalent to the ground level sensors at eleven (11) meters on the site meteorological tower.
- 6.15** Verification of release mitigation actions being planned or taken is vital to accurate dose projections. Actions such as plume wash down may reduce the amount of radioactive materials released to the public.
- 6.16** Many screens in RASCAL contain a "Help" button. Clicking on the Help button provides useful information from the code developer related to information/options on that screen.
- 6.17** Dose projection results must be approved prior to communicating the information to offsite agencies. This information is typically transmitted via the Emergency Notification Form (ENF) which is approved by the Emergency Operations Facility Command position (e.g., Emergency Response Manager.)
- 6.18** Verify that the correct units and prefixes are selected when entering data. For example: height (feet or meters); prefix (milli, kilo, etc.); activity (becquerel or curie).

## 7.0 SPECIAL TOOLS AND EQUIPMENT

7.1 RASCAL software version 3.0.5 on compatible computer.

## 8.0 ACCEPTANCE CRITERIA

N/A

## 9.0 INSTRUCTIONS

Section 9.0 contains steps primarily associated with generic RASCAL operation. A specific Attachment exists for each NGG Site and should be referenced for additional site guidance and parameters.

- Brunswick Unit 1 and 2 (BNP): Attachment 5
- Crystal River 3 (CR3): Attachment 6
- H.B. Robinson (RNP): Attachment 7
- Shearon Harris (HNP): Attachment 8

In addition, RASCAL is a software program and alternate key strokes may be used to obtain the end result. Section 9.0 describes one acceptable method to calculate dose assessments using the RASCAL software. There are multiple options available in RASCAL that may be utilized at the discretion of the user in the calculations of dose assessments

### 9.1 RASCAL Program Startup

9.1.1 **IF** not already operating, **THEN LOG ON** to the computer designated for RASCAL using your corporate ID and password with one of the following options:

- Double click on the RASCAL desktop icon
- **IF** using a Windows XP Desktop, **THEN SELECT** Start>Programs>Emergency Preparedness >RASCAL 3.0.5.
- **IF** using a Windows 7 Desktop, **THEN SELECT** Start>All Programs>DAE>Shortcuts Tab>Search RASCAL 3.0.5>Select RASCAL 3.0.5 and Run Application.

9.1.2 **IF** computer difficulties are experienced when attempting to run RASCAL, **THEN USE** another computer **AND** contact the Technology Service Desk to resolve difficulties.

9.1.3 **WHEN** the RASCAL program starts and displays text showing the version, **THEN SELECT** the "OK" button (lower right) on the screen to initiate projection process.

**9.2 THIS SECTION DELETED**

### 9.3 Select RASCAL Model

- 9.3.1 IF projecting doses from potential or ongoing releases and plant conditions, source term, and meteorological data are available, **THEN SELECT** Source Term to Dose Model (STDose) and proceed to step 9.4. This option is normally used for early phase dose assessment.
- 9.3.2 IF projecting doses from a release and at least one ground sample concentration is available, **THEN SELECT** Field Measurement to Dose Model (FMDose) and **PROCEED** to step 9.16. This option is **NOT** normally used for performing early phase dose projections.

### 9.4 Select Event Type

- 9.4.1 IF the actual or potential release is from a plant system, **THEN CHOOSE** Nuclear Power Plant **AND GO TO** Step 9.4.5.
- 9.4.2 IF the actual or potential release is from the Spent Fuel Pool, **THEN** choose Spent Fuel **AND GO TO** Step 9.4.5.
- 9.4.3 Do **NOT** select Fuel Cycle / UF6 / Criticality. This option is **NOT** currently applicable for NGG.
- 9.4.4 Do **NOT** select Other Radioactive Material Releases. This option is **NOT** currently applicable for NGG.
- 9.4.5 **SELECT** "OK" in the lower right corner of the Event Type Selection window and a ✓ mark will appear in front of Event Type when this step is complete.

### 9.5 Select Event Location

- 9.5.1 In the Site Names drop-down menu box, **CLICK** on the drop-down menu arrow, scroll down to and **SELECT** the applicable Site:
- Brunswick – Unit 1
  - Brunswick – Unit 2
  - Crystal River – Unit 3
  - H. B. Robinson – Unit 2
  - Shearon Harris – Unit 1
- 9.5.2 **SELECT** OK and a ✓ mark will appear in front of Event Location when this step is complete.

## **9.5 Select Event Location (continued)**

**9.5.3 IF EVENT TYPE is Nuclear Power Plant THEN GO to step 9.6, OTHERWISE GO to step 9.8 for Spent Fuel.**

## **9.6 Select Nuclear Power Plant Type Source Term**

This section contains options to be used for selecting source term. Sections related to source terms that are not appropriate do NOT need to be completed and the user may proceed to the desired option.

- Time Core is Uncovered - Section 9.6.1
- Ultimate Core Damage State - Section 9.6.2
- Containment Radiation Monitor - Section 9.6.3
- Coolant Sample – Section 9.6.4
- Containment Air Sample – Section 9.6.5
- Effluent Isotopic Release Rates – Section 9.6.6
- Effluent Isotopic Release Concentrations – Section 9.6.7
- Monitored Releases – Mixtures – Go to site specific procedure (References 2.2.7 – 2.2.10)

**NOTE:** Additional guidance related to Source Term and Release Path option selection is provided in Attachment 2 for all sites, Attachment 5 for BNP, Attachment 6 for CR3 and Attachment 8 for HNP.

**9.6.1 IF the Time Core is Uncovered option is selected, THEN PERFORM the following steps.**

1. **IF the reactor is shutdown, THEN ENTER the date and time of shutdown.**
2. **IF the reactor is not shutdown, THEN ENTER the date and time of the start of the release in the "Reactor shutdown" field.**
3. **IF the reactor core is uncovered, THEN SELECT Yes AND ENTER the date AND time the core was uncovered. Otherwise, SELECT No.**

9.6 **Select Nuclear Power Plant Type Source Term** (continued)

4. **IF** the reactor core is recovered, **THEN SELECT Yes AND ENTER** the date **AND** time the core was recovered. Otherwise, **SELECT No**. This step is not available if No was selected in 9.6.1.3.
5. **SELECT OK** and a ✓ mark will appear in front of Source Term when this step is complete.
6. **GO TO** Step 9.7.

9.6.2 **IF the Ultimate Core Damage State option is selected, THEN PERFORM** the following steps.

1. **IF** the reactor is shutdown, **THEN ENTER** the date and time of shutdown.
2. **IF** the reactor is not shutdown, **THEN ENTER** the date and time of the start of the release in the "Reactor shutdown" field.
3. **SELECT ONE** of the following ultimate core damage states. Read all three before selecting.
  - a. **No core damage - normal coolant activity. CHOOSE** this option if no core damage is suspected **AND ENTER** the time of normal coolant release date and time.
  - b. **Increased fuel pin leakage. CHOOSE** this option if a rapid shutdown or depressurization has occurred **AND ENTER** the time of increased fuel pin leakage date and time. A coolant contamination spike factor of 100 is appropriate as long as the core remains covered.
  - c. **Cladding failure (gap release) - with percent. CHOOSE** this option if the core is uncovered **OR** there is an indication of mechanical damage.
    - (1) **DETERMINE AND ENTER** percentage of gap release using the applicable site specific Attachment or other station procedures.
    - (2) **ENTER** completion of cladding failure date and time.
4. **SELECT OK** and a ✓ mark will appear in front of Source Term when this step is complete.
5. **GO TO** Step 9.7.



## 9.6 Select Nuclear Power Plant Type Source Term (continued)

9.6.3 IF the primary **Containment Radiation Monitor** option is selected, **THEN PERFORM** the following steps. BNP has a primary and secondary containment whereas CR3, HNP and RNP only have one "primary" containment.

1. IF the reactor is shutdown, **THEN ENTER** the date and time of shutdown.
2. IF the reactor is not shutdown, **THEN ENTER** the date and time of the start of the release in the "Reactor shutdown" field.
3. IF the dose assessment is for Brunswick, **THEN SELECT** monitor location for in dry well. BNP does not have a monitor in the wet well and the PWRs only have one option of containment dome for monitor location.
4. **OBTAIN** the radiation monitor reading(s) for the applicable site:
  - a. Brunswick - Unit 1:
    - (1)D22-RM-4195
    - (1)D22-RM-4196
    - (1)D22-RM-4197
    - (1)D22-RM-4198
  - b. Brunswick - Unit 2:
    - (2)D22-RM-4195
    - (2)D22-RM-4196
    - (2)D22-RM-4197
    - (2)D22-RM-4198
  - c. Crystal River - Unit 3: RM-G29 or RM-G30
  - d. H. B. Robinson - Unit 2: R-2, R-32A or R-32B
  - e. Shearon Harris - Unit 1: RM 3589 or RM 3590
5. **ENTER** the following for the radiation monitor:
  - a. Date
  - b. Time
  - c. Radiation monitor reading in R/hr
6. The use of the Add Row, Delete Row and Sort Rows buttons are optional and NOT required. Monitor readings for multiple times may be entered if the reading is changing by selecting the Add Row button. The Sort Row button arranges the readings by time.
7. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
8. **GO TO** Step 9.7.

## 9.6 Select Nuclear Power Plant Type Source Term (continued)

9.6.4 IF the **Coolant Sample** option is selected, **THEN PERFORM** the following steps:

1. **ENTER** the Sample ID.
2. **ENTER** the date **AND** time the sample was taken.
3. **VERIFY** the correct sample activity units by clicking on the > symbol **AND REVISE** as necessary.
4. **ENTER** the sample nuclides **AND** activity for each nuclide.
5. **SELECT** OK and a ✓mark will appear in front of Source Term when this step is complete.
6. **GO TO** Step 9.7.

9.6.5 IF the **Containment Air Sample** option is selected, **THEN PERFORM** the following steps:

1. **ENTER** the Sample ID.
2. **ENTER** the date **AND** time the sample was taken.
3. **VERIFY** the correct sample activity units by clicking on the > symbol **AND REVISE** as necessary.
4. **ENTER** the sample radionuclide **AND** activity for each radionuclide.
5. **SELECT** OK and a ✓mark will appear in front of Source Term when this step is complete.
6. **GO TO** Step 9.7.

9.6.6 IF the **Effluent Isotopic Release Rates** option is selected, **THEN PERFORM** the following steps:

1. **ENTER** the measurement location (sample origin).
2. **VERIFY** the correct Effluent release rate units by clicking on the > symbol **AND REVISE** as necessary. **CONVERT** units as necessary.
3. **ENTER** the applicable Start date **AND** Start time for each release period.
4. **ENTER** the applicable Stop date **AND** Stop time for each release period.
5. **ENTER** the nuclides **AND** release rates for each period.

6. **9.6 Select Nuclear Power Plant Type Source Term** (continued)

7. **VERIFY** the percent enrichment is five percent (5%).
8. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
9. **GO TO** Step 9.7 to enter **Release Path** information.

9.6.7 **IF** the **Effluent Isotopic Release Concentrations** option is selected, **THEN** **PERFORM** the following steps.

1. **ENTER** the measurement location (sample origin).
2. **VERIFY** the correct Effluent flow rate units by clicking on the > symbol **AND** **REVISE** as necessary. **CONVERT** units as necessary.
3. **VERIFY** the correct Effluent concentration units by clicking on the > symbol **AND** **REVISE** as necessary. Convert units as necessary.
4. **ENTER** the applicable Start date **AND** Start time for each release period.
5. **ENTER** the applicable Stop date **AND** Stop time for each release period.
6. **ENTER** the applicable Effluent flow rate for each release period.
7. **ENTER** the nuclides **AND** concentrations for each period.
8. **VERIFY** the percent enrichment is five percent (5%).
9. **IF** the sample analysis period results are greater than 24 hours prior to the release, **AND** require decay calculation per the RCC/RCD or RCM **THEN** **SELECT** DECAY.
  - a. **SELECT** the period to decay isotopes.
  - b. **SELECT** the time **AND** units to adjust the source for decay prior to release time.
  - c. **SELECT** OK.
10. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.
11. **GO TO** Step 9.7 to enter **Release Path** information.

## 9.7 SELECT Nuclear Power Plant Release Path

This section contains options to be used for selecting a release path. Sections related to release paths that are not appropriate do NOT need to be completed and the user may proceed to the desired option:

- Through the Wet Well - Section 9.7.1
- Through the Dry Well Wall - Section 9.7.2
- Bypass Secondary Containment - Section 9.7.3
- Containment Leakage/Failure – Section 9.7.4
- Steam Generator Tube Rupture – Section 9.7.5
- Containment Bypass – Section 9.7.6
- Direct to Atmosphere – Section 9.7.7

**NOTE:** Additional guidance related to Source Term and Release Path option selection is provided in Attachment 2 for all sites, Attachment 5 for BNP, Attachment 6 for CR3 and Attachment 8 for HNP.

**NOTE:** Sections 9.7.1 – 9.7.3 and section 9.7.7 are used for BNP release pathways. Sections 9.7.4 – 9.7.6 and section 9.7.7 are used for CR3, HNP, and RNP release pathways.

9.7.1 **IF the Through the Wet Well option is selected, THEN PERFORM** the following steps. This option is **ONLY** applicable to Brunswick Units 1 and 2 and assumes that the release passes by a wet pathway through the suppression pool into the secondary containment wet-well atmosphere. Particulates and aerosols airborne in the secondary containment wet well are reduced by factors to account for their interactions with the suppression pool under subcooled or saturated conditions.

1. **ENTER** a Pathway description.
2. **IF** the release point is through the reactor building, turbine building or radwaste building **THEN SELECT** Not an isolated stack.
  - a. **ENTER** 0 meters for the release height. This is considered a **Ground** release.
  - b. **SELECT YES** for Consider building wake effects.
  - c. **GO TO** Step 9.7.1.4.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

3. **IF** the release point is through the Main Stack **THEN SELECT** Isolated stack.
  - a. **ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
  - b. **IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
  - c. **IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
  - d. **IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
    - 1) Effluent flow rate and units
    - 2) Stack diameter and units
    - 3) Effluent Temperature and units
4. **ENTER** the date **AND** time of the release start to wet well.
5. **SELECT** the Percent Volume **OR** Containment Pressure/Hole Size option.
6. **ENTER** the current date **AND** current time for each event row used.
  - a. **IF** the Percent Volume option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Total Failure (100%/hr) Percent Volume in % per day or % per hour Design (0.50%/d)
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Wet Well (OPTIONAL)	Saturated Subcooled

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

- b. IF the Containment Pressure/Hole Size option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Containment pressure and units Hole area or diameter and units
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Wet Well (OPTIONAL)	Saturated Subcooled

7. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.
8. **GO TO** Step 9.10.

9.7.2 IF the **Through the Dry Well Wall** option is selected, **THEN PERFORM** the following steps. This option is **ONLY** applicable to Brunswick Units 1 and 2 and assumes that the release passes by a dry pathway through the primary system into the secondary containment dry-well atmosphere without passing through the suppression pool. Particulates and aerosols airborne in the secondary containment dry well are reduced by factors to account for the actions of sprays or natural processes.

1. **ENTER** a Pathway description.
2. IF the release point is through the reactor building, turbine building or radwaste building **THEN SELECT** Not an isolated stack.
  - a. **ENTER** 0 meters for the release height. This is considered a **Ground** release.
  - b. **SELECT YES** for Consider building wake effects.
  - c. **ENTER** the date **AND** time of the release start to dry well.
  - d. **GO TO** Step 9.7.2.4.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

3. IF the release point is through the Main Stack THEN SELECT Isolated stack.
  - a. ENTER 100 meters for the stack height. This is considered an Elevated release.
  - b. IF the ambient air temperatures are not known THEN ENTER NO for Consider plume rise.
  - c. IF the ambient air temperatures are known and will be used in the meteorological data set THEN ENTER YES for Consider plume rise.
  - d. IF desired to edit plume rise settings THEN SELECT Edit Plume Rise Settings and revise:
    - 1) Effluent flow rate and units
    - 2) Stack diameter and units
    - 3) Effluent Temperature and units
4. ENTER the date AND time of the release start to dry well.
5. SELECT the Percent Volume OR Containment Pressure/Hole Size option.
6. ENTER the current date AND current time for each event row used.
  - a. IF the Percent Volume option is selected, THEN SELECT the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Total Failure (100%/hr) Percent Volume in % per day or % per hour Design (0.50%/d)
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Sprays (OPTIONAL)	On Off

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

- b. **IF** the Containment Pressure/Hole Size option is selected, **THEN SELECT** the Event Setting options based on the following table:

Event	Event Setting Choices
Leak Rate (REQUIRED)	Containment pressure and units Hole area or diameter and units
Filters (OPTIONAL)	On Off
Filter Rel Frac (Filter Release Fractions) (OPTIONAL)	Noble gases Halogens Other radionuclides
Sprays (OPTIONAL)	On Off

7. **SELECT OK** and a ✓ mark will appear in front of Release Path when this step is complete.
8. **GO TO** Step 9.10.

9.7.3 **IF** the **Bypass Secondary Containment** option is selected, **THEN PERFORM** the following steps. This option is **ONLY** applicable to Brunswick Units 1 and 2.

1. **ENTER** a Pathway description.
2. **IF** the release point is through the reactor building, turbine building or radwaste building **THEN SELECT** Not an isolated stack.
  - a. **ENTER** 0 meters for the release height. This is considered a **Ground** release.
  - b. **SELECT YES** for Consider building wake effects.
  - c. **GO TO** Step 9.7.3.4.



## 9.7 SELECT Nuclear Power Plant Release Path (continued)

3. **IF** the release point is through the Main Stack **THEN SELECT** Isolated stack.
  - a. **ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
  - b. **IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
  - c. **IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
  - d. **IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
    - 1) Effluent flow rate and units
    - 2) Stack diameter and units
    - 3) Effluent Temperature and units.
      - If plume rise is being considered and the effluent temperature is unknown assume the effluent temperature is the same as the ambient outside temperature.

4. **ENTER** the current date **AND** current time for each event row used.

5. **SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Flow rate for the coolant bypassing the containment and units
Filters (OPTIONAL)	On Off

6. **SELECT** OK **AND** a ✓ mark will appear in front of Release Path when this step is complete.

7. **GO TO** Step 9.10.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

9.7.4 IF the **Containment Leakage/Failure** option is selected, **THEN PERFORM** the following steps. This option is **NOT** applicable to Brunswick Units 1 and 2.

1. **ENTER** a description for the release pathway.
2. **SELECT** the Not an isolated stack **AND ENTER** the release height as listed below.
  - a. Crystal River – Unit 3: 0 meters
  - b. H. B. Robinson – Unit 2 plant vent: 62 meters or 203 feet
  - c. H. B. Robinson – Unit 2, non-plant vent: 11 meters or 36 feet
  - d. Shearon Harris – Unit 1, See Attachment 8 Section 2.0
3. **SELECT Yes** for Consider building wake effects.
4. **ENTER** the date **AND** time of the release start to containment. This step is **NOT** applicable if the source term is "containment air sample".
5. **SELECT** the Percent Volume **OR** Containment Pressure/Hole Size option.
  - a. IF the Percent Volume option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Sprays	On Off
Leak Rate	Total Failure (100%/hr) Percent Volume in % per day or % per hour Design

- b. IF the Containment Pressure/Hole Size option is selected, **THEN SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Sprays	On Off
Leak Rate	Containment pressure and units Hole area or diameter and units

**9.7 SELECT Nuclear Power Plant Release Path (continued)**

6. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.
7. **GO TO** Step 9.10.

9.7.5 **IF** the **Steam Generator Tube Rupture** option is selected, **THEN PERFORM** the following steps. This option is **NOT** applicable to Brunswick Units 1 and 2.

1. **IF** the release is through a secondary side Pressure Operated Relief Valve (PORV), a safety valve or turbine building exhaust, or directly to atmosphere through a leaking/failed component, **THEN SELECT** the Safety Valve/ADV/Turbine Building exhaust option.
  - a. **ENTER** the appropriate release height as shown below:
    - 1) Crystal River – Unit 3: 0 meters or 0 feet
    - 2) H. B. Robinson – Unit 2: 11 meters or 36 feet
    - 3) Shearon Harris – Unit 1: See Attachment 8 Section 2.0
  - b. **GO TO** Step 9.7.5.3
2. **IF** the release is through the condenser to a plant vent via either a Steam Jet Air Ejector or a Condenser Vacuum Pump, **THEN SELECT** Steam Jet Air Ejector.
  - a. **ENTER** the appropriate release height as shown below:
    - 1) Crystal River – Unit 3: 0 meters or 0 feet
    - 2) H. B. Robinson – Unit 2: 62 meters or 203 feet
    - 3) Shearon Harris – Unit 1: See Attachment 8 Section 2.0
3. **SELECT Yes** to “consider building wake effects”.
4. **ENTER** the Steam Generator water mass **IF** known otherwise use default value of 9.30 E+04 lb.
5. **ENTER** the Steaming rate **IF** known otherwise use default value of 7.50E+04 lb/h.
6. **ENTER** the current date **AND** current time for each event row used.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

**NOTE:** In RASCAL, charging flow is a generic term used to describe the leak through the tubes. The charging flow is the value that quantifies the leak or net flow.

7. **SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate into SG (REQUIRED)	Number of ruptured tubes Charging flow and units
SG Condition	Partitioned – it is partitioned if the break is under the secondary side water in the steam generator.  Not Partitioned – it is not partitioned if the break is above the secondary side water or the secondary side is solid due to in-leakage of primary coolant.

8. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.

9. **GO TO** Step 9.10.

9.7.6 **IF** the **Containment Bypass** option is chosen, **THEN PERFORM** the following steps. This option is **NOT** applicable to Brunswick Units 1 and 2.

1. **ENTER** a description for the release pathway.
2. **SELECT** the Not an isolated stack **AND ENTER** the release height as shown below:
  - a. Crystal River – Unit 3: 0 feet
  - b. H. B. Robinson – Unit 2
    - Plant Vent Stack: 62 meters or 203 feet
    - Non-Plant Vent Stack Pathway: 11 meters or 36 feet
  - c. Shearon Harris – Unit 1: See Attachment 8 Section 2.0
3. **SELECT** Yes to Consider building wake effects.
4. **ENTER** the current date **AND** current time for each event row used.

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

5. **SELECT** the Event Setting options based on the following table.

Event	Event Setting Choices
Leak Rate (REQUIRED)	Flow rate for the coolant bypassing the containment and units
Filters (OPTIONAL)	On Off

6. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.

7. **GO TO** Step 9.10.

9.7.7 **IF** the release is **Direct to Atmosphere** **THEN PERFORM** the following steps: This release pathway is applicable to all Plants and is used automatically for the following source term options:

- Effluent Isotopic Release Rates
- Effluent Isotopic Release Concentrations
- Monitored Releases – Mixtures

1. **IF** the release point is through the **Brunswick Unit 1 or 2 Main Stack** **THEN SELECT** Isolated stack.

- ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
- IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
- IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
- IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
  - 1) Effluent flow rate and units
  - 2) Stack diameter and units
  - 3) Effluent Temperature and units

## 9.7 SELECT Nuclear Power Plant Release Path (continued)

- e. **GO TO** Step 9.7.7.4.
2. **SELECT** the Not an isolated stack **AND ENTER** the release height as listed below for all releases except from Brunswick Unit 1 or 2 Main Stack:
  - a. Brunswick – Unit 1 and Unit 2: 0 meters
  - b. Crystal River – Unit 3: 0 meters
  - c. H. B. Robinson – Unit 2 plant vent: 62 meters or 203 feet
  - d. H. B. Robinson – Unit 2, non-plant vent: 11 meters or 36 feet
  - e. Shearon Harris – See Attachment 8, Section 2.0
3. **SELECT** Yes for Consider building wake effects.
4. **ENTER** the start date **AND** time of the release to atmosphere.
5. **ENTER** End of release to atmosphere data by using one of the two options below:
  - a. **IF** the End time is known for the release period **THEN ENTER** the stop date **AND** time of the release to atmosphere.
  - b. **IF** the Release duration option is selected **THEN ENTER** the days, hours and minutes.
6. **SELECT** OK and a ✓ mark will appear in front of Release Path when this step is complete.
7. **GO TO** Step 9.10.

## 9.8 SELECT Spent Fuel Type Source Term

This section contains options to be used for selecting source terms for Spent Fuel accidents. Sections related to source terms that are not appropriate do NOT need to be completed and the user may proceed to the desired option.

- Pool Storage - Uncovered Fuel - Section 9.8.1
- Pool Storage – Damaged Assembly Under Water - Section 9.8.2
- Dry Storage Cask Release - Section 9.8.3

## 9.8 SELECT Spent Fuel Type Source Term (continued)

**NOTE:** Attachment 2 provides a summary of available source term selection criteria.

9.8.1 **IF** the spent fuel pool has been drained **OR** spent fuel has been uncovered > 2 hours, **THEN SELECT** Pool Storage – Uncovered Fuel **AND PERFORM** the following steps.

1. **SELECT HIGH** for Density of fuel pool racking. This step is **NOT** applicable to Brunswick Unit 1 and 2.

**NOTE:** For a fuel uncovered event, material is not considered available for release until two (2) hours after uncovered time. All fuel is considered to be damaged.

2. **SPECIFY** the amount of fuel in the pool. **IF** the Number of batches is selected for Amount of fuel in the pool **THEN ENTER** the number of batches in the pool since last irradiation as applicable for the Site location.
  - a. Brunswick – Unit 1 and 2: < 180 days, 180+ days
  - b. Crystal River – Unit 3:
    - 1) **IF** the refuel outage occurred <1 year ago, **THEN ENTER** <1 year = 1; 1-2 years = 0; >2 years = last refuel number -1.
    - 2) **IF** the refuel outage occurred 1-2 years ago, **THEN ENTER** <1 year = 0; 1-2 years = 1; >2 years = last refuel number -1.
    - 3) **IF** the refuel outage occurred >2 years ago, **THEN ENTER** <1 year = 0; 1-2 years = 0; >2 years = last refuel number.
  - c. H. B. Robinson – Unit 2: <1 year, 1-2 years, and >2 years
  - d. Shearon Harris – Unit 1: <1 year, 1-2 years, and >2 years
3. **IF** the Number of assemblies is selected for Amount of Fuel in the pool **THEN ENTER** the number of assemblies in the pool since last irradiation as applicable for the Site location.
  - a. Brunswick – Unit 1 and 2: < 180 days, 180+ days
  - b. Crystal River – Unit 3: <1 year, 1-2 years, and >2 years
  - c. H. B. Robinson – Unit 2: <1 year, 1-2 years, and >2 years
  - d. Shearon Harris – Unit 1: <1 year, 1-2 years, and >2 years

## 9.8 SELECT Spent Fuel Type Source Term (continued)

4. **ENTER** the date and time of fuel uncovered.
5. **IF** the pool is totally drained, **THEN SELECT YES AND ENTER** the date and time pool was drained. Otherwise, **SELECT NO**.
6. **IF** the fuel is recovered, **THEN SELECT YES AND ENTER** the date and time fuel is recovered. Otherwise, **SELECT NO**.
7. **SELECT OK** to proceed with case development and a ✓ mark will appear in front of Source Term when this step is complete.
8. **GO** to Step 9.9.

9.8.2 **IF** fuel assemblies have been damaged during handling, **THEN SELECT** Pool Storage – Damaged Assembly Under Water **AND PERFORM** the following steps.

1. **ENTER** the number of damaged assemblies.
2. **ENTER** the Last date of irradiation **OR ENTER** how long, in years and days the damaged assemblies have been in storage.
3. **ENTER** the date and time the damage occurred to the fuel.
4. **SELECT OK** and a ✓ mark will appear in front of Source Term when this step is complete.
5. **GO** to Step 9.9.

9.8.3 **IF** the spent fuel is damaged due to a dry storage cask event, **THEN SELECT** dry fuel storage cask event **AND PERFORM** the following steps.

1. **SELECT** the type of cask if known **OTHERWISE, SELECT UNKNOWN AND ENTER** the number of fuel assemblies in a cask.
2. **ENTER** the Last date of irradiation **OR ENTER** how long, in years the damaged assemblies have been in storage.



## 9.8 SELECT Spent Fuel Type Source Term (continued)

- NOTES:**
1. No release is projected for a loss of cask cooling less than 24 hours of the thermal limit. Another event type must be selected.
  2. A very minimal or no release is projected for a cask engulfed in fire. Another event type must be selected.

3. **ENTER** the type of event as major damage **AND ENTER** percent of fuel elements damaged **OTHERWISE SELECT** Loss of cooling greater than 24 hours (thermal limit).
4. **SELECT** OK and a ✓ mark will appear in front of Source Term when this step is complete.

## 9.9 SELECT the Spent Fuel Release Path

9.9.1 **IF** the release point is through the **Brunswick Unit 1 or 2 Main Stack THEN SELECT** Isolated stack. **OTHERWISE GO** to step 9.9.2.

1. **ENTER** 100 meters for the stack height. This is considered an **Elevated** release.
2. **IF** the ambient air temperatures are not known **THEN ENTER** NO for Consider plume rise.
3. **IF** the ambient air temperatures are known and will be used in the meteorological data set **THEN ENTER** YES for Consider plume rise.
4. **IF** desired to edit plume rise settings **THEN SELECT** Edit Plume Rise Settings and revise:
  - a. Effluent flow rate and units
  - b. Stack diameter and units
  - c. Effluent Temperature and units
5. **GO TO** Step 9.9.4.

## 9.9.2 ENTER the Pathway Description

## 9.9 SELECT the Spent Fuel Release Path (continued)

9.9.3 **SELECT** the **NOT** an isolated stack **AND ENTER** the release height as listed below.

1. Brunswick – Unit 1 and Unit 2: 0 meters
2. Crystal River – Unit 3: 0 meters
3. H. B. Robinson – Unit 2 plant vent: 62 meters or 203 feet
4. H. B. Robinson – Unit 2, unmonitored or dry fuel cask event: 11 meters or 36 feet
5. Shearon Harris – Unit 1:
  - a. Stack 1: 27.4 meters (90 feet)
  - b. Stack 3: 19.2 meters (63 feet)
  - c. Stack 5: 24.1 meters (79 feet)
  - d. Stack 5A: 18.3 meters (60 feet)

9.9.4 **SELECT Yes** for Consider building wake effects.

9.9.5 **ENTER** the start date **AND** time of the release to atmosphere.

9.9.6 **ENTER End** of release to atmosphere data by using one of the two options below.

1. **IF** the End time is known for the release period **THEN ENTER** the stop date **AND** time of the release to atmosphere.
2. **IF** the Release duration option is selected **THEN ENTER** the days, hours and minutes.

9.9.7 **IF** the building with the fuel damage accident is intact, and the operating ventilation system provides filtered releases (they do not have to be safety grade filters) **THEN ENTER YES** to filtered pathway condition if the filter system includes both HEPA and charcoal. If the system only includes HEPA filters only select YES if all fuel had decayed for more than 3 months. Otherwise, **ENTER** no for all other conditions.

9.9.8 **SELECT** the Leak rate to atmosphere as Total failure **OR** Percent volume. Total failure default is 100% since this is essentially the fastest rate at which the fission products can escape the building.

1. **IF** Percent volume is selected **THEN** enter the leak rate in % per hour.

9.9.9 **SELECT OK** and a ✓ mark will appear in front of Release Path when this step is complete.

## 9.10 SELECT Meteorology

### NOTES:

1. Meteorological data should be obtained from the appropriate source. ERFIS or PICS (CR3) should be used as the primary source for meteorological data. Every effort should be made to obtain on site meteorological data. The National Weather Service, Weather Services International (wsi.com), etc. may also be used to obtain meteorological data.
2. The pre-defined (non site specific) meteorological data may also be used if ERFIS data is unavailable. The pre-defined meteorological data is based on visual observation of existing weather conditions. **Example:** Summer-Afternoon-Rainy should be chosen if visual observation of the weather support the conditions.
3. (HNP) All release points at HNP are considered to be a ground level release due to the stack height being less than 2.5 times the height of any surrounding building. Therefore, the 12.5 m wind direction and speeds are used as input into the meteorological data.

9.10.1 **OBTAIN** meteorological data for the desired Site by referring to Attachment 3 and the applicable site specific Attachment. Attachment 3 contains standard nomenclature for weather report symbols, model classes and intensities if a weather forecast is provided by an offsite weather agency.

- Brunswick Unit 1 and 2 (BNP): Attachment 5
- Crystal River 3 (CR3): Attachment 6
- H.B. Robinson (RNP): Attachment 7
- Shearon Harris (HNP): Attachment 8

9.10.2 **CONTINUE** to 9.11 to input meteorological data.

## 9.11 INPUT Meteorology

9.11.1 **SELECT** Actual Observations and Forecasts **IF** available **OTHERWISE PROCEED** to step 9.11.2.

1. **SELECT** Create New OR **SELECT** Edit Existing.
2. **SELECT** Enter Data.
3. **SELECT** OBS for observed data OR FCST for forecast data TYPE as appropriate.

### CAUTION

RASCAL rounds meteorological data times to the nearest quarter hour. If the meteorological data time is the same as the release time and both are in the second half of a quarter hour (e.g., 0008-0014), RASCAL rounds the meteorological data time to 0015 which is after the release time and causes an error. To prevent this error, meteorological time should be adjusted to the first half of the quarter hour (e.g., 0000-0007).

4. **ENTER** the date and time for each data set.
5. **ENTER** the Direction "From" in degrees for each data set.
  - a. **IF** the instrument reading is greater than 360, **THEN** subtract 360 from the reading and enter.
6. **ENTER** the speed in mph.
  - a. **IF** an adverse met data dose projection is being performed, **THEN ENTER** a speed of 1 mph. (HNP)
7. **ENTER** stability class using the drop-down list selection.
  - a. **IF** an adverse met data dose projection is being performed **THEN ENTER** a stability class of G. (HNP)
8. **ENTER** the Precipitation type using the drop-down list selection.
  - No precipitation: <0.01 in/hr.
  - Light rain: 0.01 to 0.04 in/hr.
  - Rain: >0.04 to 0.2 in/hr.
  - Heavy rain: >0.2 in/hr.

## 9.11 INPUT Meteorology (continued)

9. **ENTER** OPTIONAL parameters if desired but they are NOT required:
  - a. Air Temperature in degrees Fahrenheit
  - b. Air Pressure (mb)
  - c. Dew Point in degrees Fahrenheit
10. **IF** an additional record is going to be added **SELECT** Add record.
  - a. **REPEAT** steps 9.11.1.3 – 9.11.1.10.
11. **SELECT** "OK" in the bottom right of the screen.
12. **SELECT** "Save and Process Data".
13. **ENTER** a name for the meteorological observation data set. This allows for repeated updating of new met data saved under different names for future retrieval.

**Example:** 090108 1100 (Date and time)

**NOTE:** The parameters listed below are not normally changed from the computer specified default values but the option is available. The RCC/RCD or RCM should be consulted prior to changing.

14. **VERIFY** the following options are selected **AND EDIT** as necessary.
  - a. Data set description: Created automatically from first site data record
  - b. Save data set as: Event-specific data set
  - c. Data processing options – Estimate missing stability using: Wind speed, time of day, etc. (recommended)
  - d. Adjust stability for consistency: Yes (recommended)
  - e. Modify winds for topography: Yes
15. **SELECT** OK.
16. **SELECT** Return.
17. **SELECT** OK and a ✓ mark will appear in front of Meteorology when this step is complete.

## 9.11 INPUT Meteorology (continued)

18. **GO TO** Step 9.12.

9.11.2 **IF** no actual observation or forecast data is available **SELECT** Predefined Data (Non Site-specific).

1. **SELECT** the available data set that most resembles current weather conditions at the site.
2. **SELECT** OK and a ✓ mark will appear in front of Meteorology when this step is complete.

## 9.12 SELECT Calculate Doses

9.12.1 **SELECT** the appropriate distances for calculations. Typically the "Close in + out to 10 miles" option is chosen to supply the required results.

9.12.2 **IF** the dose assessment is for Brunswick Unit 1 or 2 **GO TO** step 9.12.6.

9.12.3 **SELECT** user defined distances **AND** Set Close Distances.

9.12.4 **ENTER** the applicable site boundary distance of the non-UF6 Release as applicable:

1. Crystal River 3: **REPLACE** 1.000 mile with 0.83 miles.
2. Harris Plant: **REPLACE** 0.500 miles with 0.47 miles.
3. Robinson Plant: **REPLACE** 0.200 miles with 0.265 miles.

9.12.5 **SELECT** OK.

### CAUTION

The "Start of release to atmosphere plus" value is NOT the same as the release duration. The "Start of release to atmosphere plus" provides for a time duration long enough for the entire plume to pass over the region of interest. This time includes the release duration plus enough time for the entire plume to cover the area of interest. The wind speed needs to be taken into account.

9.12.6 **COMPLETE** the "End Calculations at" field.

1. **SELECT** "Start of release to atmosphere plus" **THEN ENTER** the number of hours. The default is 6 hours and is sufficient during the early phases of a release, **OR**
2. **SELECT** User specified time **THEN ENTER** the date and time. This option is normally used as additional information becomes available.

## 9.12 SELECT Calculate Doses (continued)

- 9.12.7 **ENTER** the Case description. A case description is required for identification of variations of case input data. **SELECT** OK to begin calculations and a ✓ mark will appear in front of Calculate Doses when this step is complete.

## 9.13 REVIEW Detailed Results

This step is **optional** and can be used to view detailed results that are useful in comparing projections with field team data. However critical information shall not be delayed to perform review details.

- 9.13.1 **SELECT** Detailed Results.

- 9.13.2 **SELECT** the desired options on the Detailed Results of Dose Calculations screen.

- 9.13.3 **SELECT** Display Selected Result button and the graphic display of plume footprint for the calculated case is presented on screen. **POSITION** cursor over cell to view specific bearing, distance, or dose.

- 9.13.4 **SELECT** OK, then **EXIT** to return to primary screen for completing a dose assessment.

## 9.14 Dose Projection Results

### CAUTION

Time is of the essence when conducting and approving dose projections. Dose projection results may escalate **OR** preclude emergency action level declarations.

**NOTE:** Projections developed when there is no release in progress and using "what if" data parameters are not required to be reviewed and approved. "What if" scenarios should not be disseminated to ERO personnel excluding the RCM or RCC or RCD.

- 9.14.1 **SELECT AND PRINT** the reports from the Maximum Dose Values tab **AND** the Source Term Summary tab.

## 9.14 Dose Projection Results (continued)

**NOTE:** The appropriate printer must be selected in the Print Setup option under the RASCAL File menu. This is in addition to the Windows default printer selection.

9.14.2 **PEER CHECK** the dose assessment with the assistance of another dose assessment team member, leader, RCC, RCD or RCM. The peer check shall at a minimum provide verification that:

- a. Release parameters are correct
- b. The results do not affect the current EAL classification
- c. The results do not change any Protective Action Recommendations

9.14.3 **COMPARE** dose projection results with alternate methods of dose projection, if available. These include:

- a. Comparison with field monitoring. The RASCAL detailed results provides the capability to determine location and time specific values for dose rates and airborne concentrations. These detailed results should be compared with actual field measurements and adjustments made as necessary. Field measurements may be available from utility teams, state teams, or federal teams, including fly-over surveys.
- b. Comparison with state or NRC dose projection results. Share dose projection results with state and NRC dose projection personnel. Attempt to explain any significant differences as time permits.

9.14.4 **IF** the dose projection is incorrect, **THEN** develop a new dose projection.



#### 9.14 Dose Projection Results (continued)

9.14.5 IF the projection is correct, **THEN** provide the RCM the projection print-outs for approval.

**NOTE:** Dose projection results must be approved prior to communicating the information to offsite agencies. This information is typically transmitted via the Emergency Notification Form (ENF) which is approved by the Emergency Operations Facility Command position (e.g., Emergency Response Manager.)

9.14.6 The RCM shall **REVIEW AND APPROVE** the projection. Approval is to acknowledge the:

- Dose projection is accurate.
- PARs are developed.
- Information is communicated for ENF transmittal. Dose information from the Maximum Dose Values Report should be converted from Rem to mRem prior to entering it on the ENF.

9.14.7 The RCM shall **SIGN AND DATE** the dose projection to denote approval.

9.14.8 The RCM shall **IMMEDIATELY COMMUNICATE** dose projection results for evaluation of an EAL classification impact to the Site Emergency Coordinator.

9.14.9 The RCM shall **COMMUNICATE** dose projection results **IMMEDIATELY** to the EOF if PARs are impacted OR no later than the next EOF briefing if PARs are not impacted.

9.14.10 **PROVIDE** a copy to the RASCAL Case Summary to State Dose Projection personnel at the State EOC and/or EOF for each projection released on the Emergency Notification Form (ENF).

9.14.11 IF the dose calculation is for **CRYSTAL RIVER 3** THEN fill in the blank projection duration (Item 14) of the Florida Nuclear Plant Emergency Notification Form with the correct time frame.

## 9.14 Dose Projection Results (continued)

**NOTE:** If an approved computer application is available for transferring dose projection information to the ENF electronically, then this application should be used.

9.14.12 **ENTER** the Noble Gas Activity and the Iodine Activity in Curies for Release Magnitude on Line 14 of the ENF using the Source Term Summary Report. The total activity is acceptable for reporting purposes unless a specific breakdown is requested by local State or county emergency management personnel. This step is NOT applicable to CR3.

9.14.13 **CONVERT** the RASCAL results in REM to mRem **AND ENTER** the Total Effective Dose Equivalent (TEDE) in mRem for the following distances in the appropriate blocks of the ENF using the Maximum Dose Values Report:

- site boundary
- 2.0 mile
- 5.0 mile, and
- 10 mile

9.14.14 **CONVERT** the RASCAL results in REM to mRem **AND ENTER** the Thyroid Committed Dose Equivalent (CDE) in mRem for the following distances in the appropriate blocks of the ENF using the Maximum Dose Values Report:

- site boundary,
- 2.0 mile
- 5.0 mile, and
- 10 mile

## 9.15 Save the Case

9.15.1 **SELECT** Save Case to save the projection for future review or revision. Consider the following:

1. The user creates the file name and RASCAL saves the projection file with a .STD extension.
2. The default folder for saved cases is C:\Program Files\RASCAL3\Save Case\.
3. The user may create a new subfolder for a group of projections for the current event. The recommended location for a new subfolder on the C: drive is under the default Save Case folder.
4. The case may be saved to a shared folder to allow both the TSC and EOF access. The recommended location for a shared folder is in the applicable site drive:\Shared\RASCAL\ For example Crystal River 3 would use L:\Shared\RASCAL\ Subfolders may be created in the shared directory if desired.
5. The case may be saved to a specific file that is used for direct input to the Emergency Notification Form via WEBEOC. The case should only be saved here after approval by the RCM. The file name must remain as exists (e.g., don't add a date). Saving the case to this file will delete the previous case saved in this location. The specific location for each site is:
  - a. BNP K:\SHARED\EP\ENF DATA\BNP WEBEOC.STD
  - b. CR3 Does not have direct transfer to ENF capability
  - c. HNP Y:\Shared\Emergency Preparedness\ENF\_Data\HNP Unit 1 WebEOC.STD
  - d. RNP V:\Shared\Emergency Preparedness\ENF DATA\RNP Dose.STD

9.15.2 **IF** the default folder is not going to be used **THEN CHANGE** the directory as applicable.

9.15.3 **ENTER** a File Name.

**NOTE:** If the shared case is to be modified, it needs to be copied back to the C:\RASCAL\Save Case\ folder on the hard drive. Otherwise, an error is encountered when editing met data.

9.15.4 **SELECT** Save.

## 9.16 Field Measurements to Dose Model (FMDose)

The Field Measurement to Dose model would normally be used after releases had ended to determine whether the area is habitable or do residents need long-term relocation. The model estimates doses based upon measurement of ground contamination.

9.16.1 **IF** projecting doses from a release and at least one ground sample concentration for that sample location is available, **THEN** select Field Measurement to Dose Model (FMDose). This option is **NOT** normally used for performing early phase dose projections.

9.16.2 **SELECT** Event Description.

1. **ENTER** the Event name.
2. The following information is **OPTIONAL** and not required. **ENTER** the following as desired.
  - a. Date **AND** time the release started.
  - b. Release location in latitude **AND** longitude degrees.
3. **SELECT** OK and a ✓mark will appear in front of Event Description when this step is complete.

9.16.3 **SELECT** Sample Data.

1. **ENTER** the Sample ID.
2. **ENTER** the Date **AND** time the sample was analyzed.
3. **VERIFY** the correct sample ground concentration units by clicking on the > symbol **AND REVISE** as necessary.
4. **ENTER** the sample nuclide **AND** ground concentration for each radionuclide.
5. The following information is **OPTIONAL** and not required. **ENTER** the following as desired.
  - a. Sample location in latitude **AND** longitude degrees.
  - b. Sample description.
6. **SELECT** OK and a ✓mark will appear in front of Sample Data when this step is complete.

## **9.16 Field Measurements to Dose Model (FMDose) (continued)**

### **9.16.4 SELECT Calculation Options AND REVISE the following parameters as necessary.**

1. Intermediate Phase
  - a. Reentry delay in days
  - b. Select the DIL marker nuclide. The DIL marker is a single radionuclide contained in deposition or a sample that is easily identified in the field. It is used to determine areas of concern before performing a comprehensive isotopic analysis.
2. Factors used with Ground Concentrations
  - a. Ground roughness correction factor
  - b. Initial resuspension factor per meter
  - c. Inadvertent ingestion rate in  $\text{cm}^2$  per day
  - d. Occupancy time in hours per week
  - e. Calculation settings in the desired units.
3. **SELECT OK** and a ✓ mark will appear in front of Calculation Options when this step is complete.

### **9.16.5 SELECT Compute Doses.**

1. **SELECT** the desired data to review. Options include:
  - Intermediate Phase Doses
  - Deposition Exposure Rate DILs
  - Marker Nuclide Concentration DILS
2. **SELECT** Print as desired.

### **9.16.6 SAVE the case per Section 9.15.**

## **9.17 Multiple Release Points**

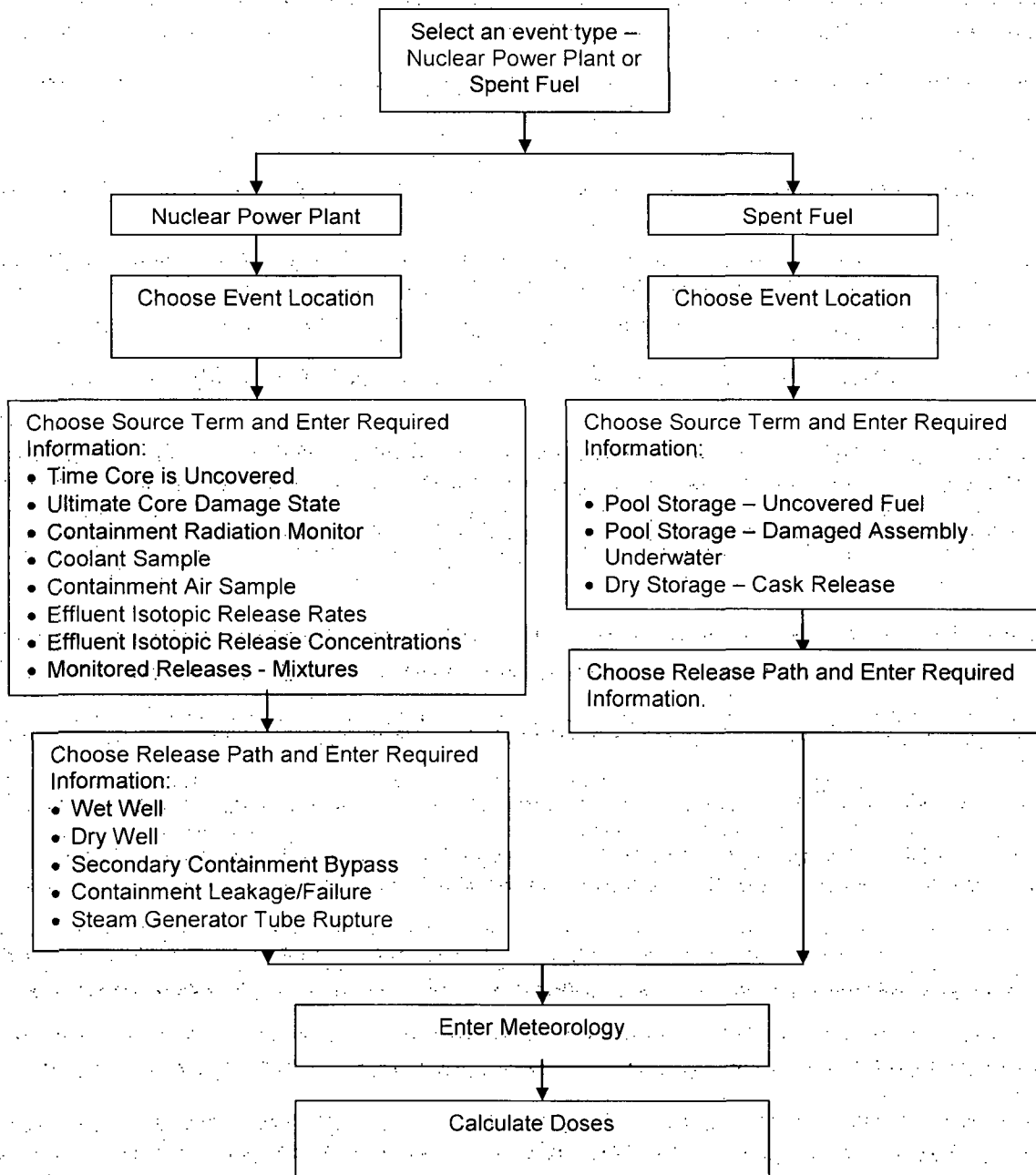
### **9.17.1 PERFORM** a separate RASCAL dose projection run for each release point.

### **9.17.2** Attachment 4, Multiple Release Point Calculation Sheet can be used as an aid for radioactive material releases from multiple plant locations.

## **10.0 RECORDS**

Records generated as a result of the performance of this procedure shall be submitted to Emergency Preparedness for retention in the plant vault.

**ATTACHMENT 1**  
**Sheet 1 of 1**  
**RASCAL General Flowpath**



**ATTACHMENT 2**  
**Sheet 1 of 2**  
**Source Term Type Selection Guide**

This table lists all the source term types available for nuclear power plant accidents, guidance on when to use each type and the source terms available.

Source Term Type	When Used	Data Needed	Available Release Paths
<b>Time Core Uncovered</b> (Procedure Step 9.6.1)	Use when you can estimate how long the core will be uncovered and you want RASCAL to estimate the core damage that will result. Catastrophic event/release. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Reactor Shutdown? Date/Time Core Uncovered? Date/Time Core Recovered? Date/Time	<b>BWR:</b> Wet Well Dry Well Secondary Containment Bypass <b>PWR:</b> Containment leakage/failure Steam generator tube rupture Containment bypass
<b>Ultimate Core Damage State</b> (Procedure Step 9.6.2)	Use this option when you believe you can make a valid estimate of the amount of core damage that has occurred. It can also be used for "what if" analyses. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Reactor Shutdown? Date/Time Core Damage state: No damage Fuel pin leakage Cladding failure  Time/Date coolant release	<b>BWR:</b> Wet Well Dry Well Secondary Containment Bypass <b>PWR:</b> Containment leakage/failure Steam generator tube rupture Containment bypass
<b>Containment Radiation Monitor</b> (Procedure Step 9.6.3)	Use containment radiation monitor when you have readings from the containment monitor, you want the code to estimate the core damage from the readings. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Reactor Shutdown? Date/Time Core Uncovered? Date/Time Containment Monitor Reading/Date/Time	<b>BWR:</b> Wet Well Dry Well <b>PWR:</b> Containment leakage/failure
<b>Coolant Sample</b> (Procedure Step 9.6.4)	Use coolant sample when you know the coolant activity and coolant will be released to the atmosphere. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Sample ID Date/Time Activity (Isotopic)	<b>BWR:</b> Secondary Containment Bypass <b>PWR:</b> Steam generator tube rupture Containment bypass
<b>Containment Air Sample</b> (Procedure Step 9.6.5)	Use air sample when you know the activity in the containment air and it will be released to the atmosphere via Containment leakage or failure. However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred and performed in accordance with a site specific procedure.	Sample ID Date/Time Activity (Isotopic)	<b>BWR:</b> Wet Well Dry Well Secondary Containment Bypass <b>PWR:</b> Containment leakage/failure

**ATTACHMENT 2**  
**Sheet 2 of 2**  
**Source Term Type Selection Guide**

Source Term Type	When Used	Data Needed	Available Release Paths
<b>Effluent Isotopic Release Rates</b> (Procedure Step 9.6.6)	Use the effluent rate when the release is through a sampled pathway that allows determination of the release rate of nuclides in terms of activity per unit time.	Release Location Release Period(s) Date/Time Activity (Isotopic)/unit time	Release direct to atmosphere
<b>Effluent Isotopic Release Concentrations</b> (Procedure Step 9.6.7)	Use the effluent concentration when the release is through a sampled pathway that allows determination of the release flow rate and the concentrations of nuclides in terms of activity per unit volume.	Release Location Release Period(s) Date/Time Activity (Isotopic)/volume	Release direct to atmosphere
<b>Monitored Releases – Mixtures</b> (Site specific procedures) BNP: OPEP-03.4.8 CR3: EM-204B HNP: PEP-344 RNP: EPRAD-03	Use the gross concentration method when you know the concentration of the activity being released, but you do not know the composition by nuclide. Site procedures provide the method to calculate release rates (Ci/sec) for noble gases, iodines and particulates using radiation monitor and flow rate information.	Reactor Shutdown? Date/Time Date/Time Sample Date/Time Release Rate Unit Release rates for: noble gases iodines particulates	Release direct to atmosphere
<b>Pool Storage – Uncovered Fuel</b> (Procedure step 9.8.1)	Use this source term when fuel is exposed above the water.	Density of fuel pool racking Number or batches of assemblies irradiated within 1,2 and 3 years Fuel uncovered? Date/Time Pool totally drained? Yes/No Fuel recovered? Yes/No	Spent fuel release pathway
<b>Pool Storage – Damaged Assembly Underwater</b> (Procedure step 9.8.2)	Use this source term when there are damaged assemblies underwater.	Number of damaged assemblies Age of damaged assemblies or how long damaged assemblies have been in storage When damage occurred – Date/Time	Spent fuel release pathway
<b>Dry Storage – Cask Release</b> (procedure step 9.8.3)	Use this source term when there are damaged assemblies in a cask.	Type of Cask Age of damaged assemblies Type of Event	Spent fuel release pathway



**ATTACHMENT 3**  
**Sheet 1 of 1**  
**Weather Report Symbol, Model Class, and Intensity**

The following table lists typical nomenclature used by offsite weather agencies to report actual and forecast meteorological data. The table can be used to aid in interpretation of offsite meteorological information received.

WEATHER REPORT SYMBOL	MODEL CLASS	INTENSITY
None	NONE	---
A	SNOW	Moderate
IC-, IP-	SNOW	Light
IC, IP	SNOW	Moderate
IC+, IP+	SNOW	Heavy
L-, L, L+	RAIN	Light
R-, RW-	RAIN	Light
R, RW	RAIN	Moderate
R+, RW+	RAIN	Heavy
S-, SG-, SP-, SW-	SNOW	Light
S, SG, SP, SW	SNOW	Moderate
S+, SG+, SP+, SW+	SNOW	Heavy
ZL-, ZL, ZL+, ZR-	RAIN	Light
ZR	RAIN	Moderate
ZR+	RAIN	Heavy

**ATTACHMENT 4**  
**Sheet 1 of 1**  
**Multiple Release Point Calculation Sheet**

RELEASE CHARACTERISTIC	TIME	TEDE (Site Boundary)	TEDE (2 Mile)	TEDE ( 5 Mile )	TEDE (10 Mile)	Total Curies
Main Stack						
Turbine Building						
Reactor or Auxiliary Building						
Torus Vent						
Other						
(1) TEDE SUM TOTAL						
(2) CURIE SUM TOTAL						(2)
	TIME	Thyroid CDE (Site Boundary )	Thyroid CDE (2 Mile)	Thyroid CDE ( 5 Mile )	Thyroid CDE (10 Mile)	
Main Stack						
Turbine Building						
Reactor or Auxiliary Building						
Torus Vent						
Other						
(3) Thyroid CDE TOTAL						

NOTE: TEDE and Thyroid CDE Summation are in units of REM and must be converted to Units of mrem prior to entering the information onto the Emergency Notification Form ( (1) or (3) Rem x 1000 = mrem)

- (1) Each TEDE Column Total corresponds to the TEDE line of the Emergency Notification Form.
- (2) Enter the Sum of Total Curies on line 14 MAGNITUDE: (Other) of the Emergency Notification Form (BNP, HNP and RNP only).
- (3) Thyroid CDE Column Total corresponds to line 16 (Thyroid CDE) of the Emergency Notification Form (BNP, HNP and RNP only).

**ATTACHMENT 5**  
**Sheet 1 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

This attachment contains the following sections:

- 1.0 Brunswick Unit 1 and 2 Default Data
- 2.0 Data Sheet for Dose Projections
- 3.0 Meteorology
- 4.0 BNP Pathway/Source Term Option Guidance

**1.0 Brunswick Unit 1 and 2 Default Data**

**Unit 1:**

<b>Average reactor power MW(th)</b>	2923	<b>Coolant volume (gal)</b>	3.379E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	30000
<b>Number of assemblies in core</b>	560	<b>Containment volume (ft<sup>3</sup>)</b>	1.641E+05	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	50000

**Unit 2:**

<b>Average reactor power MW(th)</b>	2923	<b>Coolant volume (gal)</b>	3.218E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	30000
<b>Number of assemblies in core</b>	560	<b>Containment volume (ft<sup>3</sup>)</b>	1.641E+05	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	50000

**ATTACHMENT 5**  
**Sheet 2 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**2.0 Data Sheet for Dose Projections**

CHARACTERISTIC	TIME						
Main Stack	Release Rate ( $\mu$ Ci/cc)						
	Flow Rate (CFM)						
Turbine Building	#1 Release Rate ( $\mu$ Ci/cc)						
	#1 Flow Rate (CFM)						
	#2 Release Rate ( $\mu$ Ci/cc)						
	#2 Flow Rate (CFM)						
Reactor Building	Release Rate ( $\mu$ Ci/cc)						
	Flow Rate (CFM)						
Torus Vent	Release Rate ( $\mu$ Ci/cc)						
Core Uncovered	Time (1) lost/ (2) Returned						
Effective Filtration	Yes / No						
Release Height	Ground						
	Elevated						
Release Duration	Anticipated Length of Time						
Shutdown	Date						
	Time						
Met Data Wind Speed	Upper						
	Lower						
Met Data Direction	Upper						
	Lower						
Stability	Class						
Seabreeze	Yes / No						

**ATTACHMENT 5**  
**Sheet 3 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

**3.1 IF** available **ACQUIRE** meteorological data by ERFIS.

3.1.1 **PRESS** the RETURN <CR> key a couple of times to awake the terminal.

3.1.2 **IF** the Terminal server port has been Logged-Off, **THEN ENTER** your name when prompted, **AND PRESS** RETURN <CR>. Any name will do, such as your last name.

**NOTES:**

1. The server prompt looks like "local>" or "DSVRxx" where xx is one of many ERFIS terminal server numbers.
2. Several of the connect messages may have to be tried to find an active connection.
3. Use Connect Sim for link to Simulator. This provides canned data. The other four will connect to live met data.

3.1.3 **IF** terminal is not in the above prompt condition at start of entry, **THEN CONTACT** ERFIS duty pager.

3.1.4 **TYPE** any one of the following at the keyboard, **WHEN** either of the prompts are displayed:

- CONNECT SIM <CR> For the Simulator Computer.
- CONNECT ECO1A <CR> For the U1 ERFIS Computer TRA.
- CONNECT ECO1B <CR> For the U1 ERFIS Computer RTAD.
- CONNECT ECO2A <CR> For the U2 ERFIS Computer TRA.
- CONNECT ECO2B <CR> For the U2 ERFIS Computer RTAD.

3.1.5 **TYPE** your assigned USERNAME at the next LOGIN prompt. For example:  
USERNAME: xxxxxxxxxx gepacuser <CR>

3.1.6 **TYPE** your assigned PASSWORD at the next LOGIN prompt. For example:  
PASSWORD: xxxxxxxxxx gepac <CR>**IF** your next prompt is "Enter your last Name:" For example: xxxxxx <CR>

**ATTACHMENT 5**  
**Sheet 4 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

- 3.1.7 **TYPE** your last name or work group, for example OPS, CHEMISTRY etc. **THEN** the Computer Node prompt will appear (i.e., \$, ECO1A::>, ECO1B::>, ECO2A::>, or ECO2B::>).
- 3.1.8 **TYPE W <CR>** and the ERFIS computer will display your WEATHER for the previous 15 minutes. The W\*EATHER is a logical name assigned to all the computers listed above.

**NOTES:**

1. Typing W <CR> is all that is necessary because no other DIGITAL Command starts with this letter.
2. Weather is obtained by modem from the ERFIS computer to the MET Tower every 15 minutes. Always use the Logical W\*EATHER for update to obtain the latest information.

- 3.1.9 **TYPE LOG <CR>** to end the connection to any of the above Computers, **AND TERMINATE** the process.

- 3.2 IF** ERFIS data is unavailable **THEN OBTAIN** Brunswick Nuclear Power Plant (BNP) Meteorological Data from the National Weather Service **OR** Wilmington National Weather Service data by phone. (See EPL-001, Emergency Phone List, for the telephone number).

- 3.3 DETERMINE** the Sea Breeze Potential.

- 3.3.1 **IF** all of the following conditions are present, **THEN** the potential for a Sea Breeze Effect exists:
1. BNP wind direction is between 16° and 269°, **AND**
  2. BNP Stability class of A, B, or C
  3. Meteorological Data Record time is between 0700 and 1900 hours, **AND**
  4. Meteorological Data Record date and date of Sea Breeze onset time are the same.

**ATTACHMENT 5**  
**Sheet 5 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

**3.4 IF** a Sea Breeze is present, **THEN** RASCAL projections may underestimate the dose by a factor of 2.5, and the plume behavior may be erratic. Entering additional weather station data will improve the accuracy of modeling a sea breeze condition.

3.4.1 **IF** Sea Breeze conditions exist during the case calculations, **THEN CONSPICUOUSLY MARK** printed reports as such.

3.4.2 **POINT** this out **AND COMMUNICATE** to the RCD, RCM, and other dose projection coordinators, when the reports are made available to them.

**3.5 OBTAIN** stability class from the Met Tower.

**3.6 DETERMINE** the stability class.

3.6.1 **IF** available **OBTAIN** data for stability class from the Met Tower.

3.6.2 **IF** stability class data is not available from the Met Tower **THEN CALL** the National Weather Service to obtain the data.

3.6.3 **IF** stability class data is not available from the Met Tower or National Weather Service **THEN DETERMINE** the class using the following steps.

**NOTES:**

1. **Delta T** - (Preferred method of determination) - Temperature difference between the 10m and 100m measuring points on the Met tower. Normally a negative number, but could be positive if a temperature inversion exists.
2. **Sigma theta** - (Secondary method of determination) - Standard deviation of the horizontal wind direction fluctuation.

1. **IF** meteorological data is available **THEN OBTAIN** Delta T1 and Delta T2.

a. **CALCULATE** the Differential Temperature **BY SUMMING** Delta T1 and Delta T2 **THEN DIVIDING** by 2. See equation below:

$$\frac{DT1+DT2}{2} = \text{_____} \text{ C/100M}$$

**ATTACHMENT 5**  
**Sheet 6 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**3.0 METEOROLOGY**

- b. **COMPARE** the differential temperature in the table below to the Pasquill categories to determine the stability class.

STABILITY CLASSIFICATION	PASQUILL CATEGORIES	Differential Temperature C/100M
Extremely Unstable	A	<-1.9
Moderately Unstable	B	-1.9 TO -1.7
Slightly Unstable	C	-1.7 TO -1.5
Neutral	D	-1.5 TO -0.5
Slightly Stable	E	-0.5 TO +1.5
Moderately Stable	F	+1.5 TO +4.0
Extremely Stable	G	> +4.0

2. **IF** there is no stability class data readily available, **AND** it is raining **THEN ASSUME** the stability class is D, **OTHERWISE ESTIMATE** the current Atmospheric Stability Class by visual observation using the following table:

	SUNNY DAY	CLOUDY DAY	CLOUDY NIGHT	CLEAR NIGHT
LIGHT WIND/OR CALM ≤ 4 m/sec or 8.9 mph	B	C	E	F
MODERATELY STRONG WIND ≥ 4 m/sec or 8.9 mph	C	D	D	D



**ATTACHMENT 5**  
**Sheet 7 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

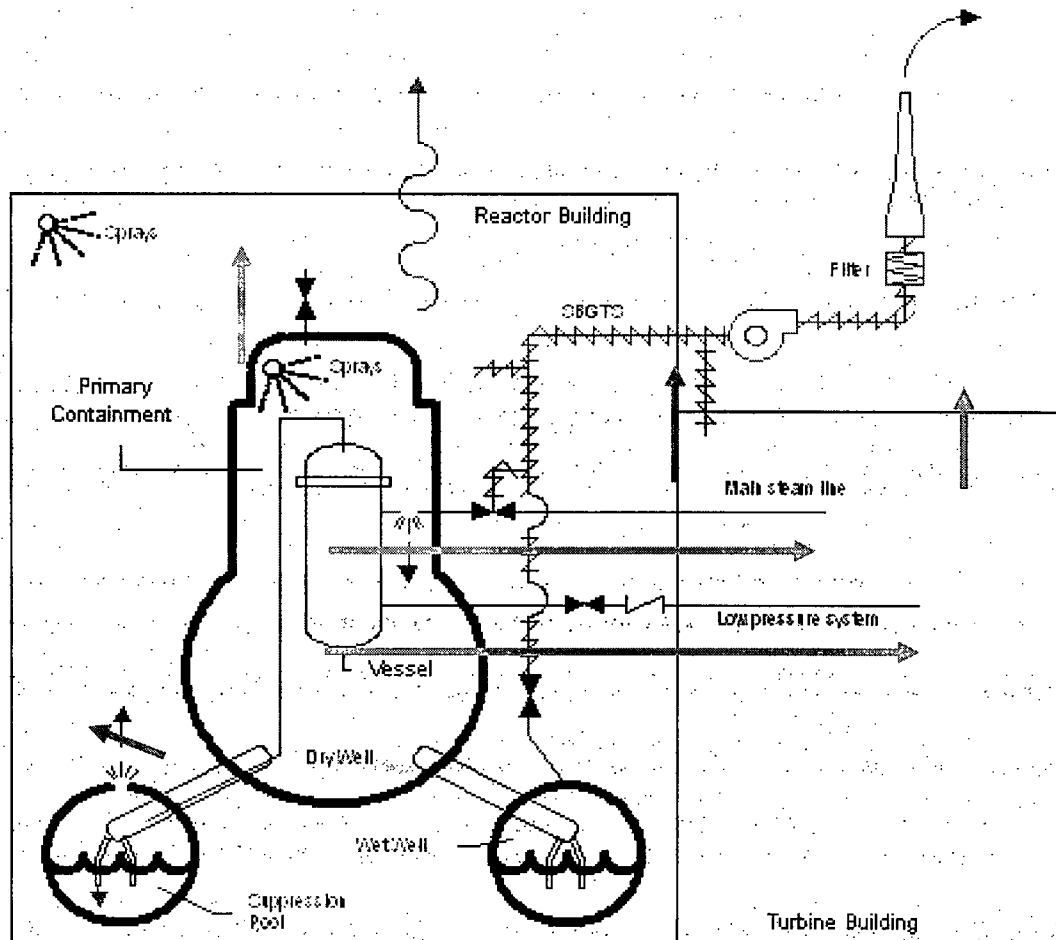
**3.0 METEOROLOGY**

3.6.4 **REFER** to the following table when an elevated release exists since, maximum radiological exposures may occur beyond the site boundary depending on Stability Class. For example:

STABILITY CLASS	DOWNWIND DISTANCE
A	0.27 MILES
B	0.45 MILES
C	0.76 MILES
D	1.8 MILES
E	3.5 MILES
F	9 MILES
G	33 MILES

**ATTACHMENT 5**  
**Sheet 8 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**4.0 BNP PATHWAY/SOURCE TERM OPTION GUIDANCE**



**Pathways**

Vessel --- Drywell -----	Environment -----	pathway 1	unmonitored	
Vessel --- Drywell -----	Reactor Building -----	Environment -----	pathway 2	monitored
Vessel --- Drywell --- Reactor Building	SBGT --- stack ---	Environment ---	pathway 3	monitored
Vessel --- Torus -----	Environment -----	pathway 4	unmonitored	
Vessel --- Torus --- Reactor Building --- SBGT ---	stack ---	Environment ---	pathway 5	monitored
Vessel --- Torus --- Reactor Building -----	Environment -----	pathway 6	monitored	
Vessel --- Turbine Building ---	Environment -----	pathway 7	unmonitored	
Vessel --- Turbine Building ---	Environment -----	pathway 8	monitored	
Vessel --- Turbine Building --- SBGT ---	stack -----	pathway 9	monitored	

**ATTACHMENT 5**  
**Sheet 9 of 9**  
**Brunswick Unit 1 and 2 Specific Actions and Parameters**

**Source Term**

Pathway 1-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 2-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 3-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 4-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 5-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 6-----Time Core is Uncovered  
Containment Radiation Monitor  
Containment Air Sample

Pathway 7-----Time Core is Uncovered  
Ultimate Core Damage State  
Coolant Sample

Pathway 8-----Time Core is Uncovered  
Ultimate Core Damage State  
Coolant Sample

Pathway 9-----Time Core is Uncovered  
Ultimate Core Damage State  
Coolant Sample

**ATTACHMENT 6**  
**Sheet 1 of 10**  
**Crystal River Specific Actions and Parameters**

This attachment contains:

- 1.0 Crystal River 3 Default Data – Sheet 1
- 2.0 CR3 Accident Types With Rascal Source Term/Release Path Options – Sheet 2  
This sheet provides guidance for selecting RASCAL source term and release path options. Assumptions should be verified with the Technical Support Team and/or the Accident Assessment Team.
- 3.0 Site Boundary (0.83 miles) Dose Estimate Credibility Evaluation – Sheet 3
- 4.0 Meteorological Data Input Sheet – Sheet 5
- 5.0 Radiological Data Input Sheet - Sheet 6
- 6.0 Alternate Methods For Determining Meteorological Data – Sheet 7
- 7.0 Methods For Determining Core Damage - Sheet 8
- 1.0 **Crystal River 3 Default Data** (Edit plant parameters as necessary.)

<b>Average reactor power MW(th)</b>	2609	<b>Coolant volume (gal)</b>	9.401E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	42000
<b>Number of assemblies in core</b>	177	<b>Containment volume (ft<sup>3</sup>)</b>	2.000E+06	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	35000

**ATTACHMENT 6**  
**Sheet 2 of 10**  
**Crystal River Specific Actions and Parameters**

**2.0 CR3 ACCIDENT TYPES WITH RASCAL SOURCE TERM / RELEASE PATH OPTIONS**

ACCIDENT TYPE	RELEASE POINT	RASCAL SOURCE TERM OPTIONS	RASCAL RELEASE PATH OPTIONS
LOCA in containment	Containment to atmosphere	Ultimate Core Damage State	Containment Leakage/Failure with pressure/hole size selected OR percent volume selected for Design Basis Leakage
		Containment Rad Monitor	
		Containment Air Sample	
		Time Core is Uncovered	
	Containment to Intermediate Bldg	Ultimate Core Damage State	Containment Leakage/Failure with pressure/hole size selected
		Containment Rad Monitor	
		Containment Air Sample	
		Time Core is Uncovered	
	Containment to Aux Bldg	Refer to LOCA in Aux Bldg	Refer to LOCA in Aux Bldg
	Post-accident venting	Monitored Release – Mixture*	Release Direct to Atmosphere
		Coolant Sample	Containment Bypass or Containment Leakage/Failure selected
		Ultimate Core Damage State	
		Time Core is Uncovered	
LOCA in Aux Bldg	Aux Bldg	Monitored Release – Mixture*	Release Direct to Atmosphere
		Effluent Isotopic Release Conc	Containment Bypass or Containment Leakage/Failure selected
		Ultimate Core Damage State	
		Containment Rad Monitor	
Steam Gen Tube Rupture	Steaming to atmosphere	Coolant Sample	Steam Generator Tube Rupture
		Ultimate Core Damage State	
	Condenser to Aux Bldg vent	Monitored Release – Mixture*	Release Direct to Atmosphere
		Ultimate Core Damage State	Steam Generator Tube Rupture
Fuel Handling	Aux Bldg	Pool Storage – Damage Underwater	Spent Fuel Release Path
		Pool Storage – Fuel Uncovered	
		Monitored Release – Mixture*	Release Direct to Atmosphere
Waste Gas Decay Tank	Aux Bldg	Monitored Release – Mixture*	Release Direct to Atmosphere
		Effluent Isotopic Release Conc	
		Effluent Isotopic Release Rate	

\* Monitored Release – Mixture is the preferred option if the release is monitored

# ATTACHMENT 6

## Sheet 3 of 10

### Crystal River Specific Actions and Parameters

#### 3.0 Site Boundary (0.83 miles) Dose Estimate Credibility Evaluation

Dose estimates in the first hour of a release may be compared with estimates in this table as a credibility check; however, actual dose rates could vary by orders of magnitude depending on plant conditions. Row 1 for extended shutdown conditions, all other rows for on-line conditions.

Monitor Reading or Accident Type	Type of Source Term Estimate	Notes	Thyroid mR per one hour	TEDE mR per one hour	Gas Ci/sec	Iodine Ci/sec
<b>Extended Shutdown:</b> RM-A2 Accident Range at 10 Ci/sec (0.45 $\mu$ Ci/cc)	RASCAL ST	12	730	1000		
<b>RM-A1 Accident Range</b> at 1 Ci/sec (4.3E-2 $\mu$ Ci/cc)	Worksht ST	1, 3	2.6	1.8		
<b>RM-A2 Accident Range</b> at 1 Ci/sec (1.4E-2 $\mu$ Ci/cc)	Worksht ST	1, 3	2.6	1.8		
<b>RM-G29/30</b> at 100 R/hr	Worksht ST	3, 4	280	12		
	RASCAL ST	2, 4	12	0.6		
<b>LOCAN</b> <u>NO</u> Core Damage	CR3 Default	3, 5	< 0.1	< 0.1	1.0E-5	1.0E-7
	RASCAL ST	6	0.2	0.5		
<b>LOCAG</b> Clad Failure	CR3 Default	3, 5	15	1.8	0.7	0.01
	RASCAL ST	7	770	38		
<b>LOCAC</b> Fuel Melting	CR3 Default	3, 5	130	29	14	0.086
	RASCAL ST	7	6300	350		
<b>WGDTR</b>	CR3 Default	3, 5	9	0.1	5.4	4.2E-5
<b>FHA</b>	CR3 Default	3, 5	11	110	68	6.7E-3
	RASCAL ST	8	< 0.1	0.1		
<b>SGTRN</b> <u>NO</u> Core Damage	CR3 Default	3, 5	24	1	0.016	0.016
	RASCAL ST	9	< 0.1	< 0.1		
	Typical RCS	10	< 0.1	< 0.1		
<b>SGTRG</b> Clad Failure	CR3 Default	3, 5, 11	2.7E5	1.3E4	1100	180
	RASCAL ST	9	100	5		
<b>SGTRC</b> Fuel Melt	CR3 Default	3, 5, 11	2.1E6	1.2E5	2.2E4	1400
	RASCAL ST	9	730	42		

**ATTACHMENT 6**  
**Sheet 4 of 10**  
**Crystal River Specific Actions and Parameters**

**3.0 Continued**

Standard Assumptions:

RASCAL model, NO holdup time, release height 0, building wake Yes, E stability class, 1 m/sec wind, NO rain, RB cfm=50,000; AB cfm=156,000

Assumption Notes From Table:

1. Base I/NG Ratio=1, Iodine DFs: Partitioning=1, Plateout=3, Sprays=10, Filters=20  
Base P/NG Ratio=0.1, Particulate DFs: Partitioning=1, Plateout=10, Sprays=10, Filters=100
2. RASCAL options: Containment Radiation Monitor, Containment Leakage/Failure
3. RASCAL options: Monitored Release – Mixtures, Release Direct to Atmosphere. The site boundary doses for RM-A1 and RM-A2 are equal because both monitors are assumed at 1 Ci/sec. However, because of the higher flow rate on RM-A2, less  $\mu\text{Ci/cc}$  is required to achieve 1 Ci/sec.
4. 30 psig, 1 square inch hole, spray off
5. 2001 default Ci/sec calculations were used to derive total  $\mu\text{Ci/cc}$  and allocation percentages for noble gases and halogens.
6. RASCAL options: Ultimate Core Damage State, Containment Bypass, 100 gpm
7. RASCAL options: Ultimate Core Damage State, Containment Leakage/Failure, Design Basis Leakage
8. 1 assembly damaged, 1 month old, RASCAL options: Assembly Damaged Underwater, Release Direct Atmosphere, 100% / hr
9. RASCAL options: Ultimate Core Damage State, Steam Generator Tube Rupture, 100 gpm
10. RASCAL options: Coolant Sample (typical on-line concentrations), Steam Generator Tube Rupture, 100 gpm
11. There is a huge disparity between the CR3 default doses and doses derived using the standard RASCAL source terms. The RASCAL source terms should be considered more credible. The CR3 default doses should be viewed as the upper limit doses bounding a SGTR event with core damage.
12. The TEDE dose is the EM-202 EAL 1.4 Protective Action Guideline (PAG) threshold value for extended shutdown conditions as documented in Calculation N12-0001.

# ATTACHMENT 6

Sheet 5 of 10

## Crystal River Specific Actions and Parameters

### 4.0 METEOROLOGICAL DATA INPUT SHEET

DATE/TIME OF TRIP: \_\_\_\_\_

DATE/TIME OF RELEASE: \_\_\_\_\_

Sources listed by priority – enter number of source data used in each column heading

1. 33ft Primary Tower
2. 175ft Primary Tower
3. 33ft Alternate Tower
4. Other \_\_\_\_\_

#### METEOROLOGICAL DATA

Rec	Obs Or Fcst	Date	Data Time	Wind Direction From Deg	Wind Speed mph	Sigma Theta Deg or Wind Range Deg or Delta T Deg F	Stability Class	Rain Inches Per 15 min	Air Temp Deg F



**ATTACHMENT 6**  
**Sheet 6 of 10**  
**Crystal River Specific Actions and Parameters**

**5.0 RADIOLOGICAL DATA SHEET**

Projection Number	Date	Data Time	Accident Type	Release Start Time	Release Stop Time	Release Flow Rate CFM/GPM	Gas $\mu\text{Ci/cc}$	Iodine $\mu\text{Ci/cc}$	Release Filtered Yes/No	Sprays On/Off

**ATTACHMENT 6**  
**Sheet 7 of 10**  
**Crystal River Specific Actions and Parameters**

**6.0 ALTERNATE METHODS FOR DETERMINING METEOROLOGICAL DATA:** The following steps are **OPTIONAL** and may be used as needed to obtain data.

**6.1 ESTIMATE** wind direction, wind speed, and wind range **BY OBSERVING** cooling tower vapor, flags, fossil stack smoke, etc.

**6.2 DETERMINE** Stability class by using Sigma Theta (preferred), Delta T, or wind range. Wind range is the difference (in degrees) between the highest and lowest wind direction tracing on the recorder for a 15 minute period.

<b>SIGMA THETA (degrees)</b>	<b>DELTA T (DEGREES)</b>	<b>WIND RANGE (degrees)</b>	<b>STABILITY CLASS</b>
$\geq 22.5$	$\leq -1.46$	$\geq 135$	A (most dispersed plume)
< 22.5 to 17.5	-1.45 to -1.31	134 to 105	B
< 17.5 to 12.5	-1.30 to -1.16	104 to 75	C
< 12.5 to 7.5	-1.15 to -0.39	74 to 45	D
< 7.5 to 3.8	-0.38 to 1.15	44 to 23	E
< 3.8 to 2.1	1.16 to 3.07	22 to 13	F
< 2.1	$\geq 3.08$	$\leq 12$	G (most concentrated plume)

**6.3 DETERMINE** wind direction by estimating the average value of the tracing for a 15 minute period.

**6.4 OBTAIN** weather data via the intra/internet by **CHOOSING** sites as required listed below.

**6.4.1 GO TO** AccuWeather.com. **ENTER** zip code 34428 **AND** hour-by-hour.

**6.4.2 GO TO** Weather.com. **ENTER** zip code 34428 **AND** select hourly.

**6.4.3 GO TO** Energy Control Center: Progress Net, Business Units and Departments, Energy Control Center Florida, Forecasts, Real Time Weather, Zone City Forecasts, **THEN CLICK** west central Florida area on map.

**ATTACHMENT 6**  
**Sheet 8 of 10**  
**Crystal River Specific Actions and Parameters**

**6.5 OBTAIN** meteorological data from the following sources if desired, however, non-local backup sources may NOT be representative. Phone numbers are in the Off-site Support Directory.

- Primary Backup - FAA Flight Service Station in Gainesville, FL.
- Secondary Backup - Tampa Weather Service in Ruskin, FL.

**6.6 REFER** to the following table to **DETERMINE** sectors affected based on the wind from direction.

<b>DEGREES</b>	<b>SECTORS</b>	<b>DEGREES</b>	<b>SECTORS</b>	<b>DEGREES</b>	<b>SECTORS</b>
349-11 (349-371)	H J K	102-123 (462-483)	N P Q	214-236	B C D
12-33 (372-393)	J K L	124-146 (484-506)	P Q R	237-258	C D E
34-56 (394-416)	K L M	147-168 (507-528)	Q R A	259-281	D E F
57-78 (417-438)	L M N	169-191 (529-540)	R A B	282-303	E F G
79-101 (439-461)	M N P	192-213	A B C	304-326	F G H
				327-348	G H J

**7.0 METHODS FOR DETERMINING CORE DAMAGE**

This section lists three methods of selecting accident type based on the level of core damage. Each method has advantages and disadvantages. Use the most appropriate method (or combination) to predict the level of core damage. Methods are:

- Based on RM-G29 and RM-G30 readings
- Based on Iodine ratio
- Based on RCS pressure and temperature

**ATTACHMENT 6**  
**Sheet 9 of 10**  
**Crystal River Specific Actions and Parameters**

**7.1 DETERMINE BASED ON RM-G29 AND RM-G30**

**NOTE:** This method can be performed quickly, but requires a breach of the Reactor Coolant System. The monitor readings assume thorough mixing of the Reactor Building atmosphere which may take several hours. Earlier readings will likely be higher (conservative).

**7.1.1 OBTAIN RM-G29 and RM-G30 readings.**

- **IGNORE spikes AND ESTIMATE** the sustained monitor reading.
- **DETERMINE** accident type using the estimated value and the following data:

<u>RM-G29/30 R/HR</u>	<u>ACCIDENT TYPE</u>
<100	Normal Coolant
100 - 25000 WITH RB SPRAY	Gas Gap Damage
100 - 75000 WITHOUT RB SPRAY	Gas Gap Damage
>25000 WITH RB SPRAY	Core Melt
>75000 WITHOUT RB SPRAY	Core Melt

**7.2 DETERMINE BASED ON IODINE RATIOS.**

**NOTE:** This method requires a gamma isotopic of a grab sample, which must be performed offsite.

There is NO way to distinguish between a gap release and a core melt release using iodine ratios.

**7.2.1 ANALYZE** a liquid or gas sample representative of the post-accident source term.

**7.2.2 DETERMINE** the ratio of I-131 to Total Iodine.

- **IF I-131/Total Iodine is < 0.05 THEN ASSUME** LOCAN or SGTRN.
- **IF I-131/Total Iodine is  $\geq$  0.05 THEN ASSUME** LOCAG or SGTRG.

**ATTACHMENT 6**  
**Sheet 10 of 10**  
**Crystal River Specific Actions and Parameters**

**7.3 DETERMINE BASED ON RCS PRESSURE AND TEMPERATURE**

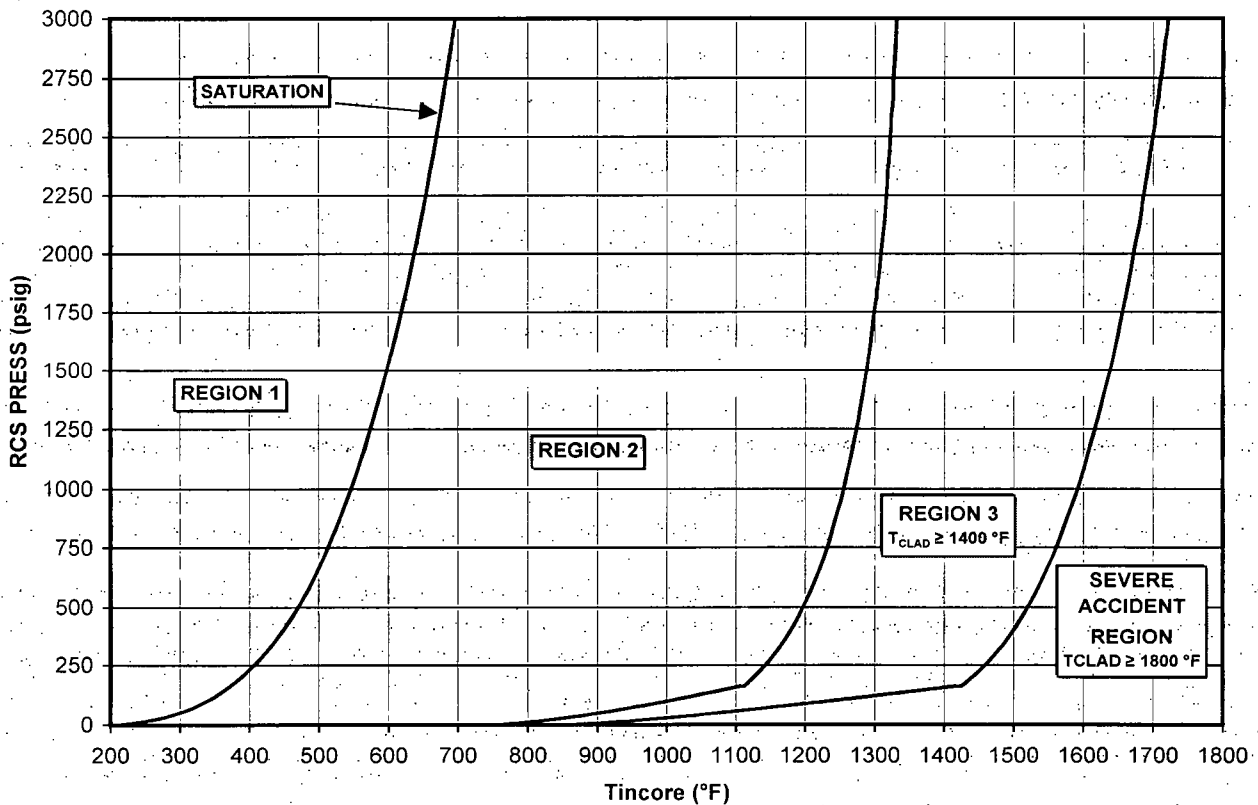
**NOTE:** This method can be performed quickly, but will NOT indicate mechanically-induced core damage. The intersection of pressure from the Y axis and temperature from the X axis is the level of core damage. (Regions are from the Inadequate Core.)

7.3.1 **LOCATE** the region on the graph where the RCS Pressure (psig) and the Tincore (degrees F) intersect.

7.3.2 **IF** intersection is Region 1 **OR** Region 2 **THEN** NO fuel damage exists. RCS activity is considered normal.

7.3.3 **IF** intersection is Region 3 **THEN** possible gas gap failure exists.

7.3.4 **IF** intersection is Severe Accident Region **THEN** possible core melt exists.



**ATTACHMENT 7**  
**Sheet 1 of 1**  
**H.B. Robinson Specific Actions and Parameters**

**1.0 H.B. Robinson Default Data**

Average reactor power MW(th)	2339	Coolant volume (gal)	4.468E+04	Avg. fuel burnup- MWD/MTU (in reactor)	30000
Number of assemblies in core	157	Containment volume (ft <sup>3</sup> )	2.100E+06	Avg. fuel burnup- MWD/MTU (in spent fuel storage)	50000

**2.0 Release Height Parameters**

**USE** the following height for radiological release points to the environment:

- Plant Vent Stack: 62 meters (203 feet)
- Other non-vent stack releases: 11 meters (36 feet)

Thirty-six (36) feet is equivalent to the ground level sensors at eleven (11) meters on the site meteorological tower.

**3.0 Meteorological Data**

- 3.1 **OBTAIN** met data from the appropriate source (OSI/PI, ERFIS, National Weather Service, Weather Services International (WSI), etc.).
- 3.2 **IF** a weather agency provides a written weather report, Attachment 3 provides information for weather report symbols. The minimum met data required for dose projection model is wind speed and direction.
- 3.3 **IF** OSI/PI and ERFIS are unavailable THEN REFER to EPRAD-03 for further guidance to obtain meteorological data.

**ATTACHMENT 8**  
**Sheet 1 of 16**  
**Shearon Harris Specific Actions and Parameters**

This attachment contains the following sections:

- 1.0 Shearon Harris Default Data – Sheet 1
- 2.0 Effective Release Heights – Sheet 1
- 3.0 Meteorological Data – Sheet 2
- 4.0 Calculate Dose Equivalent Activity – Sheet 7
- 5.0 HNP Source Term Type Selection Guide – Sheet 11

**1.0 Shearon Harris Default Data**

- 1.1 Following R17, when comparing RASCAL results with other agencies, it will be important to communicate the changes from the default values in the plant parameter table.
- 1.2 Following R17, **VERIFY** that the HNP Plant Parameters match the value in the following table, **IF** not **THEN** adjust to those values

<b>Average reactor power MW(th)</b>	2948*	<b>Coolant volume (gal)</b>	7.710E+04	<b>Avg. fuel burnup- MWD/MTU (in reactor)</b>	39,870**
<b>Number of assemblies in core</b>	157	<b>Containment volume (ft<sup>3</sup>)</b>	2.344E+06	<b>Avg. fuel burnup- MWD/MTU (in spent fuel storage)</b>	59,800**

\*From EC 74914 IMPLEMENT LICENSE CHANGE FOR THE MUR UPRATE, B.1.2 Table 1

\*\*From EC75840 HNP CYCLE 18 CORE DESIGN AND SAFETY ANALYSIS, Table B.1: Cycle 18 Neutronics Results.  
Avg. Fuel burnup (in reactor) parameter is based upon two-thirds of the EC 75840 value per NUREG 1887 Section 1.1.6

**2.0 Effective Release Heights** (enter the release height of the release point)

- 2.1 Use the following height for stack releases.

- Stack 1 (RAB & FHB) 27.4 meters (90 feet)
- Stack 3 (TB) 19.2 meters (63 feet)
- Stack 5 (WPB) 24.1 meters (79 feet)
- Stack 5A (WPB) 18.3 meters (60 feet)

## ATTACHMENT 8

### Sheet 2 of 16

#### Shearon Harris Specific Actions and Parameters

2.2 Use the following height for non-stack releases.

- Steam dumps 18.3 meters (60 feet)
- PORVs 14.9 meters (49 feet)
- Main Steam Safeties 15.9 meters (52 feet)
- CVPETS (TB Stack) 19.2 meters (63 feet)

2.3 If the release is not from one of the fixed sources noted above, then enter the actual height of the release point.

### 3.0 Meteorological Data

3.1 **OBTAIN** met data from the appropriate source (OSI/PI, ERFIS, National Weather Service, Weather Services International (WSI), etc.). For guidance on obtaining data from ERFIS, see the EP Training Module EP-08, ERFIS located at: <http://nggweb/hnppassportdm/Mgen/EP-MODULEEP08.pdf>

**NOTE:** All release points at HNP are considered to be a ground level release due to the stack height being less than 2.5 times the height of any surrounding building. Therefore, the 12.5 m wind direction and speeds are used as input into the meteorological data.

3.2 The HNP Site Meteorological Data inputs from ERFIS are:

- a. Wind Direction (from) in degrees (ERFIS ID MMT1014 Avg. Wind Direction @ 12.5 m)
- b. Speed (mph) (ERFIS ID MMT1008 Avg. Wind Speed @ 12.5 m)

3.3 **IF** a weather agency provides a written weather report, Attachment 3 provides information for weather report symbols. The minimum met data required for dose projection model is wind speed and direction.

3.4 The default data set for HNP is HARR – Shearon Harris. Other data sets based on met data monitoring locations applicable for performing complex calculations are:

- BUY – Burlington
- FAY – Fayetteville
- HARR – Shearon Harris (Default)
- GSO – Greensboro
- IGX – Chapel Hill
- MEB - Maxton
- RDU – Raleigh-Durham

3.5 **IF** OSI/PI and ERFIS are unavailable **THEN ACCESS** met data via modem connection.



**ATTACHMENT 8**  
**Sheet 3 of 16**  
**Shearon Harris Specific Actions and Parameters**

**CAUTION**

For cyber security reasons, the phone line connection at the modem must only be connected while the EOF is activated.

- 3.5.1 **CONNECT** phone line to the modem.
- 3.5.2 **SELECT** mettower from the Windows Start Bar.
- 3.5.3 **WAIT** for Windows to display the CONNECT TO box.
- 3.5.4 **SELECT** OK.
- 3.5.5 **WAIT** for Windows to display the CONNECT box.
- 3.5.6 **SELECT** the DIAL.
- 3.5.7 **WAIT** for the HyperTerminal screen to be displayed. The display will have a clear screen.
- 3.5.8 **VERIFY** the Caps Lock is off **OTHERWISE** turn the Caps Lock off.
- 3.5.9 **TYPE** in "u" **THEN CLICK** the Enter key. The "u" will NOT be seen but the following display will appear.

**USER MENU**

- |                                  |                              |
|----------------------------------|------------------------------|
| <b>(C)</b> Communications Menu   | <b>(T)</b> Test Menu         |
| <b>(F)</b> System Functions Menu | <b>(Z)</b> Zeno Program Menu |
| <b>(S)</b> Sample Period Menu    | <b>(Q)</b> Quit              |
| <b>(D)</b> Data Retrieval Menu   | <b>(H)</b> Help              |

**ATTACHMENT 8**  
**Sheet 4 of 16**  
**Shearon Harris Specific Actions and Parameters**

**3.5.10 TYPE** in "d" **THEN CLICK** the Enter key. The following display will appear:

**DATA RETRIEVAL MENU**

- |  |                                     |
|--|-------------------------------------|
| <b>(A)</b> Show Records AFTER Specified Time | <b>(F)</b> Flash Memory Information |
| <b>(B)</b> Show Records BETWEEN Timespan     | <b>(D)</b> Delete All Data Records  |
| <b>(Ln)</b> Show LAST n Records<br>Logged    | <b>(N)</b> Number Of Records        |
| <b>(*)</b> Show ALL Data Records             | <b>(U)</b> User Menu                |
| <b>(@n)</b> Show n Unmarked Records          | <b>(Q)</b> Quit                     |
| <b>(M)</b> Mark Recently Shown Data          | <b>(H)</b> Help                     |
| <b>(C)</b> Compute Data Logging Capacity     |                                     |

Precede Any "Show Data" Command With An 'X' For X-Modem Transfer  
(e.g. Enter 'X\*' To Send All Data Sets Via X-Modem)

**3.5.11 TYPE** in I1 (NOTE: this is a small "I" and a "1") **THEN CLICK** the Enter key.  
The following display of the last 15-minute average Met data will appear.  
Sample display:

**ATTACHMENT 8**  
**Sheet 5 of 16**  
**Shearon Harris Specific Actions and Parameters**

**NOTE:** Lines 2 and 3 below provide the data codes. Lines 4 and 5 provide the respective values. For example, the first value in line 2 (DATE) corresponds to the first value in line 4 (02/04/10), the third value in line 2 (AT\_11\_1\_av) corresponds to the third value in line 4 (63.57), etc. Each data code in lines 2 and 3 has a corresponding value in lines 4 and 5. The table on the next page explains the codes on lines 2 and 3.

Line 1    Hit The Space Bar To Halt The Log Data Output.

Line 2    DATE    TIME    AT\_11\_1\_av WSPD\_61\_av WVAR\_61\_av WDIR\_61\_  
              av WDIR\_12\_av WVAR\_12

Line 3    \_av WSPD\_12\_av AT\_60\_1\_av RH\_11\_av DT\_1\_av DT\_2\_av    RAIN    BP\_  
              av SOLAR\_av    DP\_av

Line 4    02/04/10 08:30:01    63.57    6.30    15.78    359.25    3.30    15.34    4.14    62.7

Line 5    3    93.88    -0.96    -0.85    0.00    30.00    0.21    61.81

Line 2 and Line 3 Code	Description	ERFIS ID
DATE	Date	N/A
TIME	Time	N/A
AT_11_1_av		
WSPD_61_av	Avg. Wind Speed @ 61.4 m	MMT1010
WVAR_61_av	Avg. Wind Direction Variance @ 61.4 m	MMT1012
WDIR_61_av	Avg. Wind Direction @ 61.4 m	MMT1013
WDIR_12_av	Avg. Wind Direction @ 12.5 m	MMT1014
WVAR_12_av	Avg. Wind Direction Variance @ 12.5 m	MMT1009
WSPD_12_av	Avg. Wind Speed @ 12.5 m	MMT1008
AT_60_1_av		
RH_11_av	Avg. Relative Humidity	MMT1018
DT_1_av	Avg. Delta Temperature 1 C/100 m	MMT1005
DT_2_av	Avg. Delta Temperature 2 C/100 m	MMT1004
RAIN	Precipitation, 15 min	MMT1003
BP_av	Avg. Barometric Pressure	MMT1002
SOLAR-av	Avg. Solar Radiation Langley/Min	MMT1001
DP-av	Avg. Dew Point, °F	MMT1000

**ATTACHMENT 8**  
**Sheet 6 of 16**  
**Shearon Harris Specific Actions and Parameters**

**DATA RETRIEVAL MENU**

- |  |                                     |
|--|-------------------------------------|
| <b>(A)</b> Show Records AFTER Specified Time | <b>(F)</b> Flash Memory Information |
| <b>(B)</b> Show Records BETWEEN Timespan     | <b>(D)</b> Delete All Data Records  |
| <b>(Ln)</b> Show LAST n Records              | <b>(N)</b> Number Of Records Logged |
| <b>(*)</b> Show ALL Data Records             | <b>(U)</b> User Menu                |
| <b>(@n)</b> Show n Unmarked Records          | <b>(Q)</b> Quit                     |
| <b>(M)</b> Mark Recently Shown Data          | <b>(H)</b> Help                     |
| <b>(C)</b> Compute Data Logging Capacity     |                                     |

Precede Any "Show Data" Command With An 'X' For X-Modem Transfer  
(e.g. Enter 'X\*' To Send All Data Sets Via X-Modem)

3.5.12 **TYPE** in "q" **THEN CLICK** the Enter key to quit the Met menu.

3.5.13 **SELECT** the CALL dropdown **AND THEN** the DISCONNECT option on the HyperTerminal Command Bar at the top to terminate the modem connection to the Met Tower.

3.5.14 **IF** there is an extended period of inactivity **THEN** the Met Tower processor will automatically terminate the User interface menu.

1. At this point data may be retrieved again by going to step 4.4.6 if this attachment.

3.5.15 **VERIFY** the phone line is disconnected at the modem when the EOF is deactivated.

3.6 **USE** the following ERFIS Points if needed for met data:

- Speed in mph – MMT1008
- Stability Class – MMT1017

3.7 **IF** OSI/PI and ERFIS are not available to provide the stability class **THEN** an alternate method that may be used is shown below.

3.7.1 **IF** only one ERFIS  $\Delta T$  channel is available (computer point MMT 1004 or MMT 1005), **THEN USE** the following table to determine the stability class.

## ATTACHMENT 8

Sheet 7 of 16

### Shearon Harris Specific Actions and Parameters

#### Stability Classes

$\Delta T$ in °C/100m	Class
$\leq -1.9^\circ$	A or 1
$> -1.9^\circ$ to $\leq -1.7^\circ$	B or 2
$> -1.7^\circ$ to $\leq -1.5^\circ$	C or 3
$> -1.5^\circ$ to $\leq -0.5^\circ$	D or 4
$> -0.5^\circ$ to $\leq +1.5^\circ$	E or 5
$> +1.5^\circ$ to $\leq +4.0^\circ$	F or 6
$> +4.0^\circ$	G or 7

3.7.2 IF the stability class is not available **THEN USE** the following table to choose the appropriate value:

Surface Wind Speed (mph)	Daytime Solar Radiation (For moderate cloud cover move one column to the right)			Nighttime Conditions		Day or Night
	Summer/ Clear Sky	Spring & Fall Clear Sky	Winter	Thin overcast ( $>1/2$ cloud cover)	$<3/8$ cloud cover	Heavy Overcast or Rain
$<4.5$	A	A-B	B	E	F	D
$\geq 4.5$ to 9.0	A-B	B	C	E	F	D
$> 9.0$ to 13.5	B	B-C	C	D	E	D
$> 13.5$	C	C-D	D	D	D	D

**ATTACHMENT 8**  
**Sheet 8 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

IF requested **CALCULATE** Dose Equivalent Activity for noble gas, halogen and particulates using the following tables.

**4.1 CALCULATE Xe-133 (Noble Gas) Dose Equivalent.**

<b>Nuclide</b>	<b>Activity (Ci)</b>	<b>X</b>	<b><math>DCF_i / DCF_{Xe-133}</math></b>	<b>=</b>	<b>Xe-133 Equivalent</b>
Kr-85		X	6.5E-02	=	
Kr-85m		X	4.7E+00	=	
Kr-87		X	2.6E+01	=	
Kr-88		X	6.5E+01	=	
Xe-131m		X	2.5E-01	=	
Xe-133		X	1.0E+00	=	
Xe-133m		X	8.5E-01	=	
Xe-135		X	7.0E+00	=	
Xe-135m		X	1.3E+01	=	
Xe-138		X	3.6E+01	=	
				<b>Γ</b>	

**4.2 CALCULATE I-131 (Halogen) Dose Equivalent.**

<b>Nuclide</b>	<b>Activity (Ci)</b>	<b>X</b>	<b><math>DCF_i / DCF_{I-131}</math></b>	<b>=</b>	<b>I-131 Equivalent</b>
I-131		X	1.0E+00	=	
I-132		X	5.9E-03	=	
I-133		X	1.7E-01	=	
I-134		X	1.0E-03	=	
I-135		X	2.9E-02	=	
				<b>Γ</b>	

**ATTACHMENT 8**  
**Sheet 9 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

**4.3 CALCULATE Cs-137 (Particulate) Dose Equivalent.**

<b>Nuclide</b>	<b>Activity (Ci)</b>	<b>X</b>	<b><math>DCF_i / DCF_{Cs-137}</math></b>	<b>=</b>	<b>Xe-133 Equivalent</b>
Cs-134		X	1.5E+00	=	
Cs-136		X	4.4E-01	=	
Cs-137		X	1.0E+00	=	
Sb-127		X	2.3E-01	=	
Sb-129		X	4.9E-02	=	
Te-129m		X	7.1E-01	=	
Te-131m		X	2.1E-01	=	
Te-132		X	2.9E-01	=	
Sr-89		X	1.2E+00	=	
Sr-90		X	3.9E+01	=	
Sr-91		X	5.9E-02	=	
Ba-140		X	1.3E-01	=	
Mo-99		X	1.3E-01	=	
Ru-103		X	3.2E-01	=	
Y-91		X	1.4E+00	=	
La-140		X	2.7E-01	=	
				<b>Σ</b>	

**ATTACHMENT 8**  
**Sheet 10 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

4.4 The following table and calculations provide insight for the Dose Equivalent activities calculated above.

**NOTE:** The Dose Conversion Factors (DCF) in the following equations are taken from Tables 5-1 and 5-2 of EPA 400-92-01, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents. The DCFs for the Xe-133 noble gas equivalent and the Cs-137 particulate equivalent are combined exposure pathway DCFs from Table 5-1. The DCFs for the I-131 halogen equivalent are from Table 5-2.

**Dose Conversion Factors mrem (DCF<sub>i</sub>)**

Isotope	DCF	Isotope	DCF	Isotope	DCF
Kr-85	1.3E+00	I-133	2.2E+05	Sr-89	5.0E+04
Kr-85m	9.3E+01	I-134	1.3E+03	Sr-90	1.6E+06
Kr-87	5.1E+02	I-135	3.8E+04	Sr-91	2.4E+03
Kr-88	1.3E+03	Cs-134	6.3E+04	Ba-140	5.3E+03
Xe-131m	4.9E+00	Cs-136	1.8E+04	Mo-99	5.2E+03
Xe-133	2.0E+01	Cs-137	4.1E+04	Ru-103	1.3E+04
Xe-133m	1.7E+01	Sb-127	9.5E+03	Y-91	5.9E+04
Xe-135	1.4E+02	Sb-129	2.0E+03	La-140	1.1E+04
Xe-135m	2.5E+02	Te-129m	2.9E+04		
Xe-138	7.2E+02	Te-131m	8.6E+03		
I-131	1.3E+06	Te-132	1.2E+04		
I-132	7.7E+03				

Equivalent activities are derived by the summation of multiplying the activity of the isotope times the ratio of the DCF for each isotope to the target isotope. Formulas for determining equivalent values are:



**ATTACHMENT 8**  
**Sheet 11 of 16**  
**Shearon Harris Specific Actions and Parameters**

**4.0 Calculate Dose Equivalent Activity**

4.5 The following table and calculations provide insight for the Dose Equivalent activities calculated above. (Continued)

**Xe-133 equivalent (Noble Gases)**

$$Xe^{133}_{TEDE} = \sum \frac{A_i x DCF_i}{DCF_{Xe-133}}$$

Where:  $A_i$  = Activity of the isotope.

$DCF_i$  = DCF of the isotope.

$DCF_{Xe-133}$  = DCF for  $Xe^{133}$

**I-131 Equivalent (Halogens)**

$$I^{131}_{CDE} = \sum \frac{A_i x DCF_i}{DCF_{I-131}}$$

Where:  $A_i$  = Activity of the isotope.

$DCF_i$  = DCF of the isotope.

$DCF_{I-131}$  = DCF for  $I^{131}$

**Cs-137 equivalent (Particulates)**

$$Cs^{137}_{TEDE} = \sum \frac{A_i x DCF_i}{DCF_{Cs-137}}$$

Where:  $A_i$  = Activity of the isotope.

$DCF_i$  = DCF of the isotope.

$DCF_{Cs-137}$  = DCF for  $Cs^{137}$

**ATTACHMENT 8**  
**Sheet 12 of 16**  
**Shearon Harris Specific Actions and Parameters**

**5.0 HNP Source Term Type Selection Guide**

This table lists all the source term types available for HNP accidents, guidance on when to use each type and the source terms available and where to obtain the required data for RASCAL inputs.

Source Term Type	When Used	Source Data Needed	Obtain From	Available Release Paths Data	Obtain From
<b>Time Core Uncovered</b> (Procedure Step 9.6.1)	Use when you can estimate how long the core will be uncovered and you want RASCAL to estimate the core damage that will result. Catastrophic event/release.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Reactor Shutdown? Date/Time  Core Uncovered? Date/Time  Core Recovered? Date/Time	EOF SRO  EOF SRO  EOF SRO	Containment leakage/failure (RCB Leak Rate by percent volume or RCB pressure/hole size)  Steam generator tube rupture by # of ruptured tubes or by charging flow  Containment bypass (RCS leak rate into RAB; Filters – Yes if building normal filtered or emergency filtered exhaust systems are operating)  Not an Isolated Stack Release Height	EOF AAT  EOF AAT EOF SRO/ERFIS  EOF SRO  Attachment 8 Section 2.0
<b>Ultimate Core Damage State</b> (Procedure Step 9.6.2)	Use this option when you believe you can make a valid estimate of the amount of core damage that has occurred. It can also be used for "what if" analyses.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Reactor Shutdown? Date/Time  Core Damage state No damage Fuel pin leakage Cladding failure  Time/Date coolant release	EOF SRO  EOF AAT  EOF AAT	Steam generator tube rupture by # of ruptured tubes or by charging flow  Containment bypass (RCS leak rate into RAB; Filters – Yes if building normal filtered or emergency filtered exhaust systems are operating)  Not an Isolated Stack Release Height	EOF AAT EOF SRO/ERFIS  EOF SRO  Attachment 8 Section 2.0

**ATTACHMENT 8**  
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<b>Containment Radiation Monitor</b> (Procedure Step 9.6.3)	Use containment radiation monitor when you have readings from the containment monitor; you want the code to estimate the core damage from the readings.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Reactor Shutdown? Date/Time Core Uncovered? Date/Time  Containment Monitor Reading/Date/Time (RM-01CR-3589-SA/SB)	EOF SRO   ERFIS/ MCR HP- RMS Tech	Containment leakage/failure (RCB Leak Rate by percent volume or RCB pressure/hole size)  Not an Isolated Stack Release Height	EOF AAT  Attachment 8 Section 2.0
<b>Coolant Sample</b> (Procedure Step 9.6.4)	Use coolant sample when you know the coolant activity and coolant will be released to the atmosphere.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Sample ID Date/Time  Activity (Isotopic – verify units Chemistry reports in $\mu\text{Ci/ml}$ )	OSC Chemistry Coord.  OSC Chemistry Coord.	Steam generator tube rupture by # of ruptured tubes or by charging flow  Containment bypass (RCS leak rate into RAB; Filters – Yes if building normal filtered or emergency filtered exhaust systems are operating)  Not an Isolated Stack Release Height	EOF AAT EOF SRO/ERFIS  EOF SRO  Attachment 8 Section 2.0

**ATTACHMENT 8**  
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<b>Containment Air Sample</b> (Procedure Step 9.6.5)	Use air sample when you know the activity in the containment air and it will be released to the atmosphere via Containment leakage or failure.  However, if the release is in progress or has occurred and is via a monitored pathway, use of the Monitored Releases – Mixtures option is preferred.	Sample ID Date/Time  Activity (Isotopic – verify units Chemistry reports in $\mu\text{Ci/ml}$ )	OSC Chemistry Coord.  OSC Chemistry Coord.	Containment leakage/failure (RCB Leak Rate by percent volume or RCB pressure/hole size)  Not an Isolated Stack Release Height	EOF AAT  Attachment 8 Section 2.0
<b>Effluent Isotopic Release Rates</b> (Procedure Step 9.6.6)	Use the effluent rate when the release is through a sampled pathway that allows determination of the release rate of nuclides in terms of activity per unit time.	Release Location Release Period(s) Date/Time Activity (Isotopic)/unit time (Need to calculate release rate: $A(\mu\text{Ci/ml}) \times F(\text{ft}^3/\text{min}) \times 4.7\text{E}(-4) = R(\text{Ci/sec})$  Isotopic Activity – Plant Vent Stack, TB or WPB Vent Stack Air Sample - verify units Chemistry reports in $\mu\text{Ci/ml}$ )  Flow Rate - Plant Vent Stack, TB or WPB Vent Stack Process Flow Rate - verify units plant data in $\text{ft}^3/\text{min}$	ERFIS/ MCR HP- RMS Tech  OSC Chemistry Coord.  EOF SRO/ MCR HP- RMS Tech	Release direct to atmosphere  Not an Isolated Stack Release Height	Attachment 8 Section 2.0

**ATTACHMENT 8**  
**Sheet 15 of 16**  
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<b>Effluent Isotopic Release Concentrations</b> (Procedure Step 9.6.7)	Use the effluent concentration when the release is through a sampled pathway that allows determination of the release flow rate and the concentrations of nuclides in terms of activity per unit volume.	Release Location Release Period(s) Date/Time  Isotopic Activity – Plant Vent Stack, TB or WPB Vent Stack Air Sample - verify units Chemistry reports in $\mu\text{Ci/ml}$ ) Flow Rate – WRGM Eff. Channel Plant Vent Stack 3509-1; WPB Stack 5 3546-1; WPB Stack 5A 3547-1; or TB Stack 3 3536-1 Process Flow Rate - verify units plant data in $\text{ft}^3/\text{min}$	ERFIS/ MCR HP- RMS Tech  OSC Chemistry Coord.  EOF SRO/ MCR HP- RMS Tech	Release direct to atmosphere  Not an Isolated Stack Release Height	Attachment 8 Section 2.0
<b>Monitored Releases – Mixtures</b> (Site specific procedure)	Use the gross concentration method when you know the concentration of the activity being released, but you do not know the composition by nuclide. Site procedures provide the method to calculate release rates (Ci/sec) for noble gases, iodines and particulates using radiation monitor and flow rate information.	See Procedure PEP-344 for data needed		See Procedure PEP-344 for data needed	
<b>Pool Storage – Uncovered Fuel</b> (Procedure step 9.8.1)	Use this source term when fuel is exposed above the water.	Density of fuel pool racking Number or batches of assemblies irradiated within 1, 2 and 3 years  Fuel uncovered? Date/Time Pool totally drained? Yes/No Fuel recovered? Yes/No	EOF AAT   EOF SRO	Spent fuel release pathway  Not an Isolated Stack Release Height  Filtered if E12 or E13 is operating	Attachment 8 Section 2.0  EOF SRO

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<b>Pool Storage – Damaged Assembly Underwater</b> (Procedure step 9.8.2)	Use this source term when there are damaged assemblies underwater.	Number of damaged assemblies Age of damaged assemblies or how long damaged assemblies have been in storage When damage occurred – Date/Time	EOF AAT	Spent fuel release pathway  Not an Isolated Stack Release Height  Filtered if E12 or E13 is operating	Attachment 8 Section 2.0  EOF SRO
<b>Dry Storage – Cask Release</b> (procedure step 9.8.3)	Use this source term when there are damaged assemblies in a cask.	Not applicable to HNP		Not applicable to HNP	

**SUMMARY OF CHANGES**  
**EMG-NGGC-0002 REV 5 PRR 617154**

SECTION/STEP	CHANGES
Att. 8 step 3.5.2, 9.1.2, Old 9.1.3	Removed program location description for WIN7 implementation. <b>(Editorial)</b>

**EMG-NGGC-0002 REV 6 PRR 615736, CR 619320**

SECTION/STEP	CHANGES
Summary of Changes	Corrected PRR number for revision 5 (PRR 619325)
Section 9.1.1 & Attachment 8 Step 3.5.2	Added removed RASCAL program instructions from previous revision and added location description for Windows 7 Desktop for WIN7 implementation.  Reverted Att. 8 step 3.5.2 back to the previous revision.

**Enclosure 2c**

**EMG-NGGC-0004,**

***Maintenance of the Emergency Response Organization,***

**Revision 3**



NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

**EMG-NGGC-0004**

**MAINTENANCE OF THE EMERGENCY RESPONSE ORGANIZATION  
NOTIFICATION SYSTEM**

REVISION 3



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## 1.0 PURPOSE

This procedure provides instructions for performing routine updates, maintenance, and testing of the Emergency Response Organization Notification System.

## 2.0 REFERENCES

### 2.1 Developmental References

None

### 2.2 Implementing References

1. CSP-NGGC-2505, Software Quality Assurance and Configuration Control of Business Computer Systems
2. EMG-NGGC-0005, Activation of the Emergency Response Organization Notification System.
3. Emergency Response Organization Notification Procedures
  - EM-206 (EM0206), [CR3] Emergency Plan Roster Notification
  - PEP-310, [HNP] Notifications and Communications
  - EPNOT-01, [RNP] CR/EOF Emergency Communicator
4. Site Emergency Plans
  - OERP, (BNP) Radiological Emergency Response Plan
  - RERP, [CR3] Radiological Emergency Response Plan
  - PLP-201, [HNP] Emergency Plan
  - PLP-007, [RNP] Robinson Emergency Plan

## 3.0 DEFINITIONS

1. EverBridge – Company that hosts the software and website used for notification
2. Group – Set of defined personnel to be notified
3. Interactive Voice Response (IVR) – One of the options EverBridge provides in the notification of ERO personnel. The system will provide a series of prompts for an individual to respond to via telephone. Once the responses are validated by EverBridge and the correct emergency notification scenario is provided, the notification will be transmitted as directed.
4. Live EverBridge Operator – One of the options EverBridge provides in the notification of ERO personnel. Using a telephone, site personnel will request an employee of EverBridge to activate the ERO. The EverBridge personnel will in turn request member I.D. and scenario information from the caller to initiate the notification process.

### 3.0 DEFINITIONS (continued)

5. Personnel Roster Excel Spreadsheet – Provides the data needed to create the ERO Notification System database within EverBridge. This data includes, but is not limited to Name, Telephone Number (s), Pager Number, ERO Team Designation, ERO Position, etc.
6. Polling – Set of pre-established questions, such as fitness for duty and response time, used for analysis when activating the ERO.
7. Pop-up window – Small window that will appear during the programming of the notification. The window will typically be used to confirm an action.
8. Scenario –A group of messages sent to the ERO to activate in an emergency.
9. Upload message – Program the EverBridge system to send a message.

### 4.0 RESPONSIBILITIES

#### 4.1 Emergency Preparedness Staff

1. The Emergency Preparedness Staff is responsible for the maintenance and oversight of the Emergency Response Organization Notification System.
2. Pre-scripted messages will be developed and maintained by the Emergency Preparedness Staff to enable prompt notification of the Emergency Response Organization upon classification of an event.

#### 4.2 Security and Operations Personnel

Security and Operations personnel are primarily responsible for activation of the Emergency Response Organization Notification System.

### 5.0 PREREQUISITES

None

### 6.0 PRECAUTIONS, LIMITATIONS AND NOTES

1. Security and Operations personnel should be notified each time the system is unavailable. Alternate methods to notify the ERO are in place at each site and will be initiated. Site procedures provide specific information on the actions to take if this should occur.
2. Changes to scenarios and messages may affect the performance of this system in the event of an emergency. Peer checks for changes such as these are recommended.

## 6.0 PRECAUTIONS, LIMITATIONS AND NOTES(continued)

3. Newly developed or significantly modified scenarios should be tested for operation prior to placing them in service. Use of these scenarios may begin immediately with procedure revision to follow in a timely manner.
  - A procedure revision request should be initiated when a new scenario is created or a current scenario is modified.
4. The use of abbreviations should be avoided within the system. If this is not possible, use letters with the appropriate spacing. Abbreviations will be pronounced as a word if not input correctly. The words or letters will be pronounced as they are written.
5. Text boxes contain a limited amount of character spaces. There are approximately 40 in the Scenario Title and 31 in the Message Box.
6. Use the EverBridge menu items and tools to navigate within the website.
7. Use caution when making changes on any of the EverBridge screens. Many of the screens do not ask for confirmation before changes are made. Use error reduction tools when adding or deleting information.

## 7.0 SPECIAL TOOLS AND EQUIPMENT

None

## 8.0 ACCEPTANCE CRITERIA

None

## 9.0 INSTRUCTIONS

### 9.1 Startup

1. **LOG** onto the Emergency Response Organization Notification System, EverBridge OR go to the internet and type "www.everbridge.net". ..... ☐
2. **ENTER** your unique member ID and Password to access the system. ☐

**NOTE:** References to Notifications and Messages may be interchangeable due to software application limitations

### 9.2 Creating Emergency or Drill Messages

1. **SELECT** "Send Notification." ..... ☐
2. **SELECT** "Send Notification" again, underneath "Send Notification". .... ☐
3. **SELECT** "STANDARD MESSAGE"..... ☐

## 9.2 Creating Emergency or Drill Messages (continued)

4. **SELECT** "ADD" in the "message to be distributed to groups" or "message to be distributed to individuals" field. .... ☐
5. **CHOOSE** a "Group Name" or "individual name" to send a message to. .... ☐
6. **SELECT** "close window" once all selections have been made. .... ☐
7. **SELECT** "Next" ..... ☐

**NOTE:** Textboxes contain a limited amount of character spaces

8. **TYPE** in the title of the message in the "Message Title" box. .... ☐
9. **CHOOSE** the desired option from the "Record message via:" field.
  - a. "Enter a text message". Proceed to Step 9.2.10 if choosing this option. .... NA ☐ ☐
  - b. "Telephone". See Enclosure 1 for instruction. Proceed to Step 9.2.11 once option is completed. .... NA ☐ ☐
  - c. "Upload message". See Enclosure 2 for instruction. Proceed to Step 9.2.11 once option is completed. .... NA ☐ ☐

### CAUTION

Use of abbreviations should be avoided whenever possible.

10. **TYPE** the appropriate text message in the "Type your message" field using minimal abbreviations. .... ☐
11. **SELECT** "Next" ..... ☐
12. **SELECT** "Create message to be scheduled later" on the "Schedule Message/Choose Delivery Methods" page. .... ☐
13. Under "Sender Identification", **VERIFY** the display shows your site's ERO notification email address and sender caller ID. .... ☐
  - a. BNP: BNP\_ERO@pgnmail.com, 910-457-3000
  - b. HNP: HNP\_ERO@pgnmail.com, 919-362-2447
  - c. RNP: RNP\_ERO@pgnmail.com, 843-857-1000
  - d. CR3: CR3\_ERO@pgnmail.com, 352-563-4987

**NOTE:** Enclosure 3 contains information to determine which option is applicable for use.

14. **CHANGE** "message delivery options" as necessary. .... ☐

## 9.2 Creating Emergency or Drill Messages (continued)

15. **SELECT** the message delivery devices based on the message attributes under "Delivery Methods". ..... ☐
16. **VERIFY** email and fax number are correct under "broadcast results delivery method" and select checkboxes as necessary. .... ☐
17. **SELECT** "Save Message"..... ☐

## 9.3 Create Scenario

1. **SELECT** "Scenario Manager". ..... ☐
2. **SELECT** "Create Scenario". ..... ☐
3. **TYPE** in a "scenario name" in the "add a scenario" field. .... ☐
4. **SELECT** "SAVE"..... ☐
5. **SELECT** "ADD"..... ☐
6. **CHOOSE** desired message from the "choose unscheduled messages" list. .... ☐
7. **SELECT** "close window" once selection has been made. .... ☐
8. **SELECT** "SAVE"..... ☐
9. **SELECT** "YES" from "pop-up" message. .... ☐

## 9.4 Creating Polling Notifications

1. **SELECT** "Send Notification". ..... ☐
2. **SELECT** "Polling Notification". ..... ☐
3. **SELECT** "STANDARD POLLING MESSAGE". .... ☐
4. **SELECT** "ADD" in the "message to be distributed to groups" or "message to be distributed to individuals" field. .... ☐
5. **CHOOSE** "Group Names" or "individual names" from the "pop-up" list for the distribution of the message. .... ☐
6. **SELECT** "close window" once selections have been made. .... ☐
7. **SELECT** "NEXT"..... ☐

<b>NOTE:</b> Text boxes contain a limited amount of character spaces.
---

8. **TYPE** the title of the message in the "Message Title" box. .... ☐



#### 9.4 Creating Polling Notifications (continued)

9. **CHOOSE** the desired option from the "Record message via:" field.
  - a. "Enter a text message". Proceed to Step 9.4.10 if choosing this option. .... NA ☐ ☐
  - b. "Telephone". See Enclosure 1 for instruction. Proceed to Step 9.4.11 once option is completed..... NA ☐ ☐
  - c. "Upload message". Enclosure 2 for instruction. Proceed to Step 9.4.11 once option is completed..... NA ☐ ☐
10. **TYPE** the appropriate text message in the "Type your message" field. ☐
11. **SELECT** "NEXT"..... ☐
12. **TYPE** in the polling statements or questions requiring response..... ☐

<b>NOTE:</b> Enclosure 3 contains information to determine which option is applicable for use.
--

13. If necessary, **ENTER** the "Data Input" and "Call Transfer" information needed for the poll as necessary using the check box and drop-down list on the "Create Polling Response" screen. .... NA ☐ ☐
14. **SELECT** "NEXT"..... ☐
15. **SELECT** "Create message to be scheduled later" under "Schedule Message/Choose Delivery Methods" page. .... ☐
16. **VERIFY** the display shows your site's ERO notification email address and sender caller ID under "Sender Identification"..... ☐
  - a. BNP: BNP\_ERO@pgnmail.com, 910-457-3000
  - b. HNP: HNP\_ERO@pgnmail.com, 919-362-2447
  - c. RNP: RNP\_ERO@pgnmail.com, 843-857-1000
  - d. CR3: CR3\_ERO@pgnmail.com, 352-563-4987

<b>NOTE:</b> Enclosure 3 contains information to determine which option is applicable for use.
--

17. **CHANGE** message delivery options as necessary. .... ☐
18. **SELECT** the message delivery devices based on the message attributes under "Delivery Methods". .... ☐
19. **VERIFY** fax number and email message are correct under "broadcast results delivery method" **AND SELECT** check boxes as necessary. ... ☐
20. **SELECT** "Save Message"..... ☐

## 9.5 Scheduling Recurring Notifications

1. **SELECT** "Send Notification"..... ☐
2. **SELECT** "Send Notification" again, underneath "Send Notification"..... ☐
3. **SELECT** "STANDARD MESSAGE"..... ☐
4. **SELECT** "ADD" on the "message to be distributed to groups" or "message to be delivered to individuals" field. .... ☐
5. **CHOOSE** a "Group Name" or "individual name" to send a message to. ☐
6. **SELECT** "close window" once all selections have been made. .... ☐
7. **SELECT** "Next"..... ☐

**NOTE:** Text boxes contain a limited amount of character spaces.

8. **TYPE** in the title of the message in the "Message Title" box..... ☐
9. **CHOOSE** the desired option from the "Record message via:" field.
  - a. "Enter a text message". Proceed to Step 9.5.10 if choosing this option. .... NA ☐ ☐
  - b. "Telephone". See Enclosure 1 for instruction. Proceed to Step 9.5.11 once option is completed..... NA ☐ ☐
  - c. "Upload message". See Enclosure 2 for instruction. Proceed to Step 9.5.11 once option is completed. .... NA ☐ ☐

### CAUTION

Use of abbreviations should be avoided whenever possible.

10. **TYPE** the appropriate text message in the "Type your message" field. ☐
11. **SELECT** "NEXT"..... ☐
12. **SELECT** "Schedule Message" under "Schedule Message/Choose Delivery Method" page..... ☐
13. **CHOOSE** the start date of the message..... ☐
14. **CHOOSE** the start time of the message. .... ☐
15. **SELECT** the "☐ "send every" option and **CHOOSE** the time interval that you wish the message to be sent..... ☐
16. **CHOOSE** ending date for message..... ☐

## 9.5 Scheduling Recurring Notifications (Continued)

17. **VERIFY** the display shows your site's ERO notification email address and sender caller ID under "Sender Identification"..... ☐
- a. BNP: BNP\_ERO@pgnmail.com, 910-457-3000
  - b. HNP: HNP\_ERO@pgnmail.com, 919-362-2447
  - c. RNP: RNP\_ERO@pgnmail.com, 843-857-1000
  - d. CR3: CR3\_ERO@pgnmail.com, 352-563-4987

<p><b>NOTE:</b> Enclosure 3 contains information to determine which option is applicable for use.</p>
---

18. **CHANGE** message delivery options as necessary..... ☐
19. **SELECT** the message delivery devices based on the message attributes under "Delivery Methods". ..... ☐
20. **VERIFY** email and fax number are correct under "broadcast results delivery method" and select checkboxes as necessary. .... ☐
21. **SELECT** "Schedule Message"..... ☐

**NOTE:** Use of the following steps to obtain a copy of the "Broadcast Results" from a LAN computer are optional.

## 9.6 Broadcast Report

### 9.6.1 Once the scenario has been broadcast using the LAN, you can access the Broadcast Results in three ways:

#### 9.6.2 The direct method: NA ☐ ☐

1. **SELECT** the "I.D." number (located on the left side) to display the "Broadcast Results" screen, once you have activated the scenario..... ☐
2. **SCROLL** to the bottom of the page to view the status as it unfolds. The status will be displayed as: ..... ☐  
**confirmed                  not confirmed                  unreachable**
3. **PRINT** the report to determine the status of each member of the ERO as necessary by selecting "PRINT" located at the bottom of the screen. .. ☐

#### 9.6.3 The indirect method: NA ☐ ☐

1. **ACCESS** "Mange Broadcasts" on the left side of the page..... ☐
2. **ACCESS** "Track Active Broadcasts." ..... ☐
3. **SELECT** the "Active Broadcast:" I.D." number..... ☐
4. **SCROLL** to the bottom of the page to view the status as it unfolds. The status will be displayed as: ..... ☐  
**confirmed                  not confirmed                  unreachable**
5. **PRINT** the report to determine the status of each member of the ERO as necessary by selecting "PRINT" located at the bottom of the screen. .. ☐

#### 9.6.4 The archived method: NA ☐ ☐

1. **ACCESS** "Reports" on the left side of the page..... ☐
2. **ACCESS** "Broadcast Report." ..... ☐
3. **LOCATE** the report by "I.D." number, Message Title, or "Start Date" from the dropdown list of pages listed in chronological order..... ☐
4. **SELECT** the appropriate "I.D." number..... ☐
5. **PRINT** the report as necessary by selecting "PRINT" located at the bottom of the screen. .... ☐

### 9.7 Deleting Emergency Notification Scenarios

1. **SELECT** "Scenario Manager". ..... ☐
2. **SELECT** "Manage Scenario". ..... ☐
3. **CHOOSE** the Scenario you wish to delete..... ☐

#### **CAUTION**

The software will not display a prompt once "Delete Scenario" is selected.

4. **SELECT** "Delete Scenario". ..... ☐

## 9.8 Deleting Unscheduled Messages

1. **SELECT** "Manage Broadcasts". ..... ☐
2. **SELECT** "Manage Messages". ..... ☐
3. **SELECT** "UNSCHEDULED MESSAGES". ..... ☐
4. **SELECT** the "trash can" icon that corresponds with the message you wish to delete. .... ☐
5. **SELECT** "OK" when asked "Are you sure you want to cancel this unscheduled broadcast?" ..... ☐

<b>NOTE:</b> You must be logged onto the system as an administrator to perform sub-sections 9.9 through 9.14.
---

## 9.9 Updating Individual Member Contact Information in Emergency Notification Software

1. **SELECT** "Members". ..... ☐
2. **SELECT** "Manage Members". ..... ☐
3. **SEARCH** for the individual by entering individual's first or last name in "first name" or "last name" field. .... ☐
4. **SELECT** "Search". ..... ☐
5. **CHOOSE** the individual name requiring contact info update. .... ☐
6. **MAKE** updates to profile information as appropriate. .... ☐
7. **SELECT** "Save". ..... ☐
8. **UPDATE** additional information as needed using the available options on the bottom of the screen. .... ☐
9. **SAVE** any changes made within the options. .... ☐

#### 9.10 Removing Individual Members in Emergency Notification Software

1. **SELECT** "Members". ..... ☐
2. **SELECT** "Manage Members." ..... ☐
3. **SEARCH** for the individual by entering individual's first or last name in "first name" or "last name" field. .... ☐
4. **SELECT** "Search". ..... ☐
5. **SELECT** the "trash can" icon that corresponds with the member you wish to delete. .... ☐
6. **SELECT** "End Membership". ..... ☐
7. **SELECT** "OK". ..... ☐

#### 9.11 Group Personnel Roster Additions/Changes

**NOTE:** This section will provide the basic information needed to update the Personnel Roster Excel Spreadsheet, which is maintained outside the EverBridge system. This database will be maintained and updated as necessary.

1. **ADD** the appropriate "Action" in the first column:..... ☐
  - a. A – Add
  - b. U – Update
  - c. D – Delete
  - d. C – Replace Data Value
  - e. B – Add if not in system, update if in system (preferred)

## 9.11 Group Personnel Roster Additions/Changes (continued)

### CAUTION

Partial entry is not allowed for personnel information.

**NOTE:** Columns with the headings “User Attribute Field Name” and “User Attribute” are linked. If one of the fields is not known, then leave both columns empty.

2. **ENSURE** the last column contains “END” ..... ☐
3. **SAVE** Personnel Roster Spreadsheet as a “.csv” file. .... ☐
4. **Logon** to EverBridge website. .... ☐
5. **SELECT** “Members”. .... ☐
6. **SELECT** “Add Members”. .... ☐
7. **SELECT** “Upload List of Members”. .... ☐
8. **OPEN** Browser **AND SELECT** the appropriate Personnel Roster Excel Spreadsheet file that was previously revised. .... ☐
9. **SELECT** “Upload”. .... ☐
10. **IF** any errors are identified, **THEN RESOLVE** the errors on the spreadsheet **AND UPLOAD** the file again by following Steps 9.11.4 through 9.11.9. .... NA ☐ ☐

## 9.12 Adding Groups and Members to the Groups

1. **SELECT** “Groups and Filters” ..... ☐
2. **SELECT** “Add Groups” ..... ☐
3. **ENTER** “Group name” ..... ☐
4. **SELECT** “Save”. .... ☐
5. **ADD** members by **SELECTING** “Add” ..... ☐
6. **SEARCH** for individual by entering individual’s first name or last name in “first name” or “last name” field. .... ☐
7. **SELECT** “Search”. .... ☐
8. **SEARCH** for groups by selecting “Search Group” button. .... ☐



## 9.12 Adding Groups and Members to the Groups(continued)

9. **CHOOSE** individual or group requiring addition to the members list. ... ☐
10. **REPEAT** Steps 9.12.6 through 9.12.9 for each individual or group needing placement. .... ☐
11. **SELECT** "close window". .... ☐
12. **SELECT** "Save". .... ☐
13. **SELECT** "Yes" or "No" on the pop-up window to accept or decline requested individual or group name..... ☐

## 9.13 Deleting Groups

<b>NOTE:</b> There is not a "save" option for this action.
--

1. **SELECT** "Groups and Filters". .... ☐
2. **SELECT** "Manage Groups". .... ☐
3. **SELECT** the appropriate "Group Name" by clicking the appropriate "\*". ☐
4. **SELECT** the Trashcan icon or "DELETE SELECTED". .... ☐
5. **SELECT** "OK" on pop-up window to accept or decline requested group name..... ☐

## 9.14 Deleting Group Members

1. **SELECT** "Groups and Filters". .... ☐
2. **SELECT** "Manage Groups". .... ☐
3. **SELECT** the appropriate "Group Name" by clicking on the group name. .... ☐
4. **SELECT** "Individual" to be deleted from the "Members" field..... ☐
5. **SELECT** "Remove". .... ☐
6. **SELECT** "Save". .... ☐
7. **SELECT** "Yes" or "No" on pop-up window to accept or decline requested individual's name. .... ☐

## 10.0 RECORDS

No Records are generated by this procedure.

**EverBridge Options – Telephone**

1. **CLICK** on the telephone button. .... ☐
2. **FOLLOW** instructions provided in the “pop-up” window to record a message.  
..... ☐
3. **RETURN** to the web application to continue creating the message by  
selecting “READY”. .... ☐

**EverBridge Options – Upload Message**

- 1. **CLICK** on the “Upload Message” button..... ☐
- 2. **CLICK** on “Browse” ..... ☐
- 3. **SELECT** the appropriate .wav file from the “Choose file” window by double clicking on file name..... ☐
- 4. **SELECT** “UPLOAD” ..... ☐

### Message Delivery Options Definitions

**Confirm** - By default the message will be delivered with confirmation required. Un-checking the confirm box delivers a message without request for confirmation to all selected contact paths and eliminates the 10-digit call back number from being displayed to recipient.

**Escalate** - Checking this box delivers a message with Escalation to additional members as defined in the chosen member's profile.

**Broadcast Duration** - Member can choose duration for the broadcast. Emergency broadcast defaults to 30 minutes, Standard broadcast defaults to two hours.

**Contact Cycles** - Select the number of times you would like the message to cycle through each delivery method. The message will cycle through all the delivery methods selected until the message has been confirmed, all the cycles have been exhausted, or when the duration time ends.

**Interval Between Delivery Methods** – Select the interval (up to three min) that you choose to occur between the chosen delivery methods.

**Interval Between Cycles** – Select the interval (up to one hr) that you choose to occur between contact cycles.

**Require PIN to hear Message** - Checking this option will require the member input PIN # to hear the message. (Note: The PIN # is defined by the organization leader at the member level. The option is viewable when turned on.)

**Voice Mail Preference** – Select: No Message, Message Only, or Message with Confirmation Info to be included with Voice Mail option.

**Send Attachment(s) to** – If attachments have been added to message, choose where you would like the attachments sent: E-mail and Fax, E-mail only, or Fax Only.

**Delivery Methods** – Select the message delivery methods for your broadcast. When a text message is created with no recorded voice, only the text path checkboxes will be checked. To convert your text to speech you must select the desired voice paths, when sending your notification you will be prompted to convert text to voice. (Note: A recorded message without any text will only display voice devices.)

**Broadcast Results Delivery Method** - Broadcast results can be delivered via E-mail and/or fax by checking the appropriate checkbox, entering the desired E-mail address, and/or Fax number. (You have the option to send the broadcast results to any E-mail and/or fax #. Note: Broadcast results via fax will show a summary of the broadcast.)

**Call Transfer** - When a recipient chooses call transfer, the recipient is forwarded to another phone number that has been programmed into the polling response.

**Data Input** - This allows the recipient to respond with **numeric only** data to the questions that are being polled such as; phone #, date, time.

**Summary of Changes**  
**PRR 617154**

SECTION/STEP	CHANGES
9.1.1	Removed program location description for WIN7 implementation. <b>(Editorial)</b>

**Enclosure 2d**  
**EMG-NGGC-0004,**  
**Maintenance of the Emergency Response Organization,**  
**Revision 4**



**NUCLEAR GENERATION GROUP****STANDARD PROCEDURE****VOLUME 99****BOOK/PART 99****EMG-NGGC-0004****MAINTENANCE OF THE EMERGENCY RESPONSE ORGANIZATION  
NOTIFICATION SYSTEM****REVISION 4**



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## 1.0 PURPOSE

This procedure provides instructions for performing routine updates, maintenance, and testing of the Emergency Response Organization Notification System.

## 2.0 REFERENCES

### 2.1 Developmental References

None

### 2.2 Implementing References

1. CSP-NGGC-2505, Software Quality Assurance and Configuration Control of Business Computer Systems
2. EMG-NGGC-0005, Activation of the Emergency Response Organization Notification System.
3. Emergency Response Organization Notification Procedures
  - EM-206 (EM0206), [CR3] Emergency Plan Roster Notification
  - PEP-310, [HNP] Notifications and Communications
  - EPNOT-01, [RNP] CR/EOF Emergency Communicator
4. Site Emergency Plans
  - OERP, (BNP) Radiological Emergency Response Plan
  - RERP, [CR3] Radiological Emergency Response Plan
  - PLP-201, [HNP] Emergency Plan
  - PLP-007, [RNP] Robinson Emergency Plan

## 3.0 DEFINITIONS

1. EverBridge – Company that hosts the software and website used for notification
2. Group – Set of defined personnel to be notified
3. Interactive Voice Response (IVR) – One of the options EverBridge provides in the notification of ERO personnel. The system will provide a series of prompts for an individual to respond to via telephone. Once the responses are validated by EverBridge and the correct emergency notification scenario is provided, the notification will be transmitted as directed.
4. Live EverBridge Operator – One of the options EverBridge provides in the notification of ERO personnel. Using a telephone, site personnel will request an employee of EverBridge to activate the ERO. The EverBridge personnel will in turn request member I.D. and scenario information from the caller to initiate the notification process.

### 3.0 DEFINITIONS (continued)

5. Personnel Roster Excel Spreadsheet – Provides the data needed to create the ERO Notification System database within EverBridge. This data includes, but is not limited to Name, Telephone Number (s), Pager Number, ERO Team Designation, ERO Position, etc.
6. Polling – Set of pre-established questions, such as fitness for duty and response time, used for analysis when activating the ERO.
7. Pop-up window – Small window that will appear during the programming of the notification. The window will typically be used to confirm an action.
8. Scenario –A group of messages sent to the ERO to activate in an emergency.
9. Upload message – Program the EverBridge system to send a message.

### 4.0 RESPONSIBILITIES

#### 4.1 Emergency Preparedness Staff

1. The Emergency Preparedness Staff is responsible for the maintenance and oversight of the Emergency Response Organization Notification System.
2. Pre-scripted messages will be developed and maintained by the Emergency Preparedness Staff to enable prompt notification of the Emergency Response Organization upon classification of an event.

#### 4.2 Security and Operations Personnel

Security and Operations personnel are primarily responsible for activation of the Emergency Response Organization Notification System.

### 5.0 PREREQUISITES

None

### 6.0 PRECAUTIONS, LIMITATIONS AND NOTES

1. Security and Operations personnel should be notified each time the system is unavailable. Alternate methods to notify the ERO are in place at each site and will be initiated. Site procedures provide specific information on the actions to take if this should occur.
2. Changes to scenarios and messages may affect the performance of this system in the event of an emergency. Peer checks for changes such as these are recommended.

## 6.0 PRECAUTIONS, LIMITATIONS and notes.0 PRECAUTIONS, LIMITATIONS AND NOTES 5(continued)

3. Newly developed or significantly modified scenarios should be tested for operation prior to placing them in service. Use of these scenarios may begin immediately with procedure revision to follow in a timely manner.
  - A procedure revision request should be initiated when a new scenario is created or a current scenario is modified.
4. The use of abbreviations should be avoided within the system. If this is not possible, use letters with the appropriate spacing. Abbreviations will be pronounced as a word if not input correctly. The words or letters will be pronounced as they are written.
5. Text boxes contain a limited amount of character spaces. There are approximately 40 in the Scenario Title and 31 in the Message Box.
6. Use the EverBridge menu items and tools to navigate within the website.
7. Use caution when making changes on any of the EverBridge screens. Many of the screens do not ask for confirmation before changes are made. Use error reduction tools when adding or deleting information.

## 7.0 SPECIAL TOOLS AND EQUIPMENT

None

## 8.0 ACCEPTANCE CRITERIA

None

## 9.0 INSTRUCTIONS

### 9.1 Startup

1. **LOG** onto the Emergency Response Organization Notification System, EverBridge using one of the following options:
  - Go to the internet and type "www.everbridge.net". ..... ☐
  - **IF** using a Windows XP Desktop, **THEN SELECT**  
Start>Programs>Emergency Preparedness >EverBridge..... ☐
  - **IF** using a Windows 7 Desktop, **THEN SELECT**  
Start>All Programs>DAE>Shortcuts Tab>Search  
EverBridge>Select EverBridge and Run Application..... ☐
2. **ENTER** your unique member ID and Password to access the system. ☐

**NOTE:** References to Notifications and Messages may be interchangeable due to software application limitations

### 9.2 Creating Emergency or Drill Messages

1. **SELECT** "Send Notification." ..... ☐
2. **SELECT** "Send Notification" again, underneath "Send Notification". .... ☐
3. **SELECT** "STANDARD MESSAGE"..... ☐
4. **SELECT** "ADD" in the "message to be distributed to groups" or "message to be distributed to individuals" field. .... ☐
5. **CHOOSE** a "Group Name" or "individual name" to send a message to. ☐
6. **SELECT** "close window" once all selections have been made. .... ☐
7. **SELECT** "Next"..... ☐

**NOTE:** Textboxes contain a limited amount of character spaces

8. **TYPE** in the title of the message in the "Message Title" box..... ☐

## 9.2 Creating Emergency or Drill Messages (continued)

9. **CHOOSE** the desired option from the "Record message via:" field.
- "Enter a text message". Proceed to Step 9.2.10 if choosing this option. .... NA ☐ ☐
  - "Telephone". See Enclosure 1 for instruction. Proceed to Step 9.2.11 once option is completed..... NA ☐ ☐
  - "Upload message". See Enclosure 2 for instruction. Proceed to Step 9.2.11 once option is completed. .... NA ☐ ☐

### CAUTION

Use of abbreviations should be avoided whenever possible.

10. **TYPE** the appropriate text message in the "Type your message" field using minimal abbreviations..... ☐
11. **SELECT** "Next"..... ☐
12. **SELECT** "Create message to be scheduled later" on the "Schedule Message/Choose Delivery Methods" page. .... ☐
13. Under "Sender Identification", **VERIFY** the display shows your site's ERO notification email address and sender caller ID..... ☐
- BNP: BNP\_ERO@pgnmail.com, 910-457-3000
  - HNP: HNP\_ERO@pgnmail.com, 919-362-2447
  - RNP: RNP\_ERO@pgnmail.com, 843-857-1000
  - CR3: CR3\_ERO@pgnmail.com, 352-563-4987

**NOTE:** Enclosure 3 contains information to determine which option is applicable for use.

14. **CHANGE** "message delivery options" as necessary. .... ☐
15. **SELECT** the message delivery devices based on the message attributes under "Delivery Methods": ..... ☐
16. **VERIFY** email and fax number are correct under "broadcast results delivery method" and select checkboxes as necessary ..... ☐
17. **SELECT** "Save Message"..... ☐

### 9.3 Create Scenario

1. **SELECT** "Scenario Manager" ..... ☐
2. **SELECT** "Create Scenario" ..... ☐
3. **TYPE** in a "scenario name" in the "add a scenario" field. .... ☐
4. **SELECT** "SAVE" ..... ☐
5. **SELECT** "ADD" ..... ☐
6. **CHOOSE** desired message from the "choose unscheduled messages" list. .... ☐
7. **SELECT** "close window" once selection has been made. .... ☐
8. **SELECT** "SAVE" ..... ☐
9. **SELECT** "YES" from "pop-up" message. .... ☐

### 9.4 Creating Polling Notifications

1. **SELECT** "Send Notification" ..... ☐
2. **SELECT** "Polling Notification" ..... ☐
3. **SELECT** "STANDARD POLLING MESSAGE" ..... ☐
4. **SELECT** "ADD" in the "message to be distributed to groups" or "message to be distributed to individuals" field. .... ☐
5. **CHOOSE** "Group Names" or "individual names" from the "pop-up" list for the distribution of the message. .... ☐
6. **SELECT** "close window" once selections have been made. .... ☐
7. **SELECT** "NEXT" ..... ☐

**NOTE:** Text boxes contain a limited amount of character spaces.

8. **TYPE** the title of the message in the "Message Title" box. .... ☐



#### 9.4 Creating Polling Notifications (continued)

9. **CHOOSE** the desired option from the "Record message via:" field.
- "Enter a text message". Proceed to Step 9.4.10 if choosing this option. .... NA ☐ ☐
  - "Telephone". See Enclosure 1 for instruction. Proceed to Step 9.4.11 once option is completed..... NA ☐ ☐
  - "Upload message". Enclosure 2 for instruction. Proceed to Step 9.4.11 once option is completed..... NA ☐ ☐
10. **TYPE** the appropriate text message in the "Type your message" field. ☐
11. **SELECT** "NEXT"..... ☐
12. **TYPE** in the polling statements or questions requiring response..... ☐

**NOTE:** Enclosure 3 contains information to determine which option is applicable for use.

13. If necessary, **ENTER** the "Data Input" and "Call Transfer" information needed for the poll as necessary using the check box and drop-down list on the "Create Polling Response" screen. .... NA ☐ ☐
14. **SELECT** "NEXT"..... ☐
15. **SELECT** "Create message to be scheduled later" under "Schedule Message/Choose Delivery Methods" page. .... ☐
16. **VERIFY** the display shows your site's ERO notification email address and sender caller ID under "Sender Identification"..... ☐
- BNP: BNP\_ERO@pgnmail.com, 910-457-3000
  - HNP: HNP\_ERO@pgnmail.com, 919-362-2447
  - RNP: RNP\_ERO@pgnmail.com, 843-857-1000
  - CR3: CR3\_ERO@pgnmail.com, 352-563-4987

**NOTE:** Enclosure 3 contains information to determine which option is applicable for use.

17. **CHANGE** message delivery options as necessary. .... ☐
18. **SELECT** the message delivery devices based on the message attributes under "Delivery Methods". .... ☐
19. **VERIFY** fax number and email message are correct under "broadcast results delivery method" **AND SELECT** check boxes as necessary. ... ☐
20. **SELECT** "Save Message"..... ☐

## 9.5 Scheduling Recurring Notifications

1. **SELECT** "Send Notification"..... ☐
2. **SELECT** "Send Notification" again, underneath "Send Notification"..... ☐
3. **SELECT** "STANDARD MESSAGE"..... ☐
4. **SELECT** "ADD" on the "message to be distributed to groups" or "message to be delivered to individuals" field. .... ☐
5. **CHOOSE** a "Group Name" or "individual name" to send a message to. ☐
6. **SELECT** "close window" once all selections have been made. .... ☐
7. **SELECT** "Next"..... ☐

**NOTE:** Text boxes contain a limited amount of character spaces.

8. **TYPE** in the title of the message in the "Message Title" box..... ☐
9. **CHOOSE** the desired option from the "Record message via:" field.
  - "Enter a text message". Proceed to Step 9.5.10 if choosing this option. .... NA ☐ ☐
  - "Telephone". See Enclosure 1 for instruction. Proceed to Step 9.5.11 once option is completed..... NA ☐ ☐
  - "Upload message". See Enclosure 2 for instruction. Proceed to Step 9.5.11 once option is completed. .... NA ☐ ☐

### CAUTION

Use of abbreviations should be avoided whenever possible.

10. **TYPE** the appropriate text message in the "Type your message" field. ☐
11. **SELECT** "NEXT"..... ☐
12. **SELECT** "Schedule Message" under "Schedule Message/Choose Delivery Method" page..... ☐
13. **CHOOSE** the start date of the message. .... ☐
14. **CHOOSE** the start time of the message. .... ☐
15. **SELECT** the "☐ "send every" option and **CHOOSE** the time interval that you wish the message to be sent..... ☐
16. **CHOOSE** ending date for message..... ☐

## 9.5 Scheduling Recurring Notifications (Continued)

17. **VERIFY** the display shows your site's ERO notification email address and sender caller ID under "Sender Identification" ..... ☐
- BNP: BNP\_ERO@pgnmail.com, 910-457-3000
  - HNP: HNP\_ERO@pgnmail.com, 919-362-2447
  - RNP: RNP\_ERO@pgnmail.com, 843-857-1000
  - CR3: CR3\_ERO@pgnmail.com, 352-563-4987

**NOTE:** Enclosure 3 contains information to determine which option is applicable for use.

18. **CHANGE** message delivery options as necessary ..... ☐
19. **SELECT** the message delivery devices based on the message attributes under "Delivery Methods" ..... ☐
20. **VERIFY** email and fax number are correct under "broadcast results delivery method" and select checkboxes as necessary. .... ☐
21. **SELECT** "Schedule Message" ..... ☐

**NOTE:** Use of the following steps to obtain a copy of the "Broadcast Results" from a LAN computer are optional.

## 9.6 Broadcast Report

### 9.6.1 Once the scenario has been broadcast using the LAN, you can access the Broadcast Results in three ways:

#### 9.6.2 The direct method:

NA ☐ ☐

1. **SELECT** the "I.D." number (located on the left side) to display the "Broadcast Results" screen, once you have activated the scenario..... ☐
2. **SCROLL** to the bottom of the page to view the status as it unfolds. The status will be displayed as: ..... ☐  
**confirmed                  not confirmed                  unreachable**
3. **PRINT** the report to determine the status of each member of the ERO as necessary by selecting "PRINT" located at the bottom of the screen. ... ☐

#### 9.6.3 The indirect method:

NA ☐ ☐

1. **ACCESS** "Manage Broadcasts" on the left side of the page..... ☐
2. **ACCESS** "Track Active Broadcasts." ..... ☐
3. **SELECT** the "Active Broadcast." I.D." number..... ☐
4. **SCROLL** to the bottom of the page to view the status as it unfolds. The status will be displayed as: ..... ☐  
**confirmed                  not confirmed                  unreachable**
5. **PRINT** the report to determine the status of each member of the ERO as necessary by selecting "PRINT" located at the bottom of the screen... ☐

#### 9.6.4 The archived method:

NA ☐ ☐

1. **ACCESS** "Reports" on the left side of the page..... ☐
2. **ACCESS** "Broadcast Report." ..... ☐
3. **LOCATE** the report by "I.D." number, Message Title, or "Start Date" from the dropdown list of pages listed in chronological order..... ☐
4. **SELECT** the appropriate "I.D." number..... ☐
5. **PRINT** the report as necessary by selecting "PRINT" located at the bottom of the screen. .... ☐

## 9.7 Deleting Emergency Notification Scenarios

1. **SELECT** "Scenario Manager" ..... ☐
2. **SELECT** "Manage Scenario" ..... ☐
3. **CHOOSE** the Scenario you wish to delete..... ☐

### CAUTION

The software will not display a prompt once "Delete Scenario" is selected.

4. **SELECT** "Delete Scenario" ..... ☐

## 9.8 Deleting Unscheduled Messages

1. **SELECT** "Manage Broadcasts" ..... ☐
2. **SELECT** "Manage Messages" ..... ☐
3. **SELECT** "UNSCHEDULED MESSAGES" ..... ☐
4. **SELECT** the "trash can" icon that corresponds with the message you wish to delete ..... ☐
5. **SELECT** "OK" when asked "Are you sure you want to cancel this unscheduled broadcast?" ..... ☐

**NOTE:** You must be logged onto the system as an administrator to perform sub-sections 9.9 through 9.14.

## 9.9 Updating Individual Member Contact Information in Emergency Notification Software

1. **SELECT** "Members" ..... ☐
2. **SELECT** "Manage Members" ..... ☐
3. **SEARCH** for the individual by entering individual's first or last name in "first name" or "last name" field ..... ☐
4. **SELECT** "Search" ..... ☐
5. **CHOOSE** the individual name requiring contact info update. .... ☐
6. **MAKE** updates to profile information as appropriate. .... ☐
7. **SELECT** "Save" ..... ☐
8. **UPDATE** additional information as needed using the available options on the bottom of the screen. .... ☐
9. **SAVE** any changes made within the options. .... ☐

#### 9.10 Removing Individual Members in Emergency Notification Software

1. **SELECT** "Members"..... ☐
2. **SELECT** "Manage Members."..... ☐
3. **SEARCH** for the individual by entering individual's first or last name in "first name" or "last name" field..... ☐
4. **SELECT** "Search"..... ☐
5. **SELECT** the "trash can" icon that corresponds with the member you wish to delete..... ☐
6. **SELECT** "End Membership"..... ☐
7. **SELECT** "OK"..... ☐

#### 9.11 Group Personnel Roster Additions/Changes

**NOTE:** This section will provide the basic information needed to update the Personnel Roster Excel Spreadsheet, which is maintained outside the EverBridge system. This database will be maintained and updated as necessary.

1. **ADD** the appropriate "Action" in the first column:..... ☐
  - A – Add
  - U – Update
  - D – Delete
  - C – Replace Data Value
  - B – Add if not in system, update if in system (preferred)

## 9.11 Group Personnel Roster Additions/Changes (continued)

### CAUTION

Partial entry is not allowed for personnel information.

**NOTE:** Columns with the headings "User Attribute Field Name" and "User Attribute" are linked. If one of the fields is not known, then leave both columns empty.

2. **ENSURE** the last column contains "END" ..... ☐
3. **SAVE** Personnel Roster Spreadsheet as a ".csv" file ..... ☐
4. **Logon** to EverBridge website ..... ☐
5. **SELECT** "Members" ..... ☐
6. **SELECT** "Add Members" ..... ☐
7. **SELECT** "Upload List of Members" ..... ☐
8. **OPEN** Browser **AND SELECT** the appropriate Personnel Roster Excel Spreadsheet file that was previously revised ..... ☐
9. **SELECT** "Upload" ..... ☐
10. **IF** any errors are identified, **THEN RESOLVE** the errors on the spreadsheet **AND UPLOAD** the file again by following Steps 9.11.4 through 9.11.9. .... NA ☐ ☐

## 9.12 Adding Groups and Members to the Groups

1. **SELECT** "Groups and Filters" ..... ☐
2. **SELECT** "Add Groups" ..... ☐
3. **ENTER** "Group name" ..... ☐
4. **SELECT** "Save" ..... ☐
5. **ADD** members by **SELECTING** "Add" ..... ☐
6. **SEARCH** for individual by entering individual's first name or last name in "first name" or "last name" field. .... ☐
7. **SELECT** "Search" ..... ☐
8. **SEARCH** for groups by selecting "Search Group" button ..... ☐



#### 9.12 Adding Groups and Members to the Groups(continued)

9. **CHOOSE** individual or group requiring addition to the members list. ... ☐
10. **REPEAT** Steps 9.12.6 through 9.12.9 for each individual or group needing placement. .... ☐
11. **SELECT** "close window" ..... ☐
12. **SELECT** "Save" ..... ☐
13. **SELECT** "Yes" or "No" on the pop-up window to accept or decline requested individual or group name..... ☐

#### 9.13 Deleting Groups

**NOTE:** There is not a "save" option for this action.

1. **SELECT** "Groups and Filters" ..... ☐
2. **SELECT** "Manage Groups" ..... ☐
3. **SELECT** the appropriate "Group Name" by clicking the appropriate "\*" ☐
4. **SELECT** the Trashcan icon or "DELETE SELECTED" ..... ☐
5. **SELECT** "OK" on pop-up window to accept or decline requested group name..... ☐

#### 9.14 Deleting Group Members

1. **SELECT** "Groups and Filters" ..... ☐
2. **SELECT** "Manage Groups" ..... ☐
3. **SELECT** the appropriate "Group Name" by clicking on the group name. .... ☐
4. **SELECT** "Individual" to be deleted from the "Members" field ..... ☐
5. **SELECT** "Remove" ..... ☐
6. **SELECT** "Save" ..... ☐
7. **SELECT** "Yes" or "No" on pop-up window to accept or decline requested individual's name. .... ☐

#### 10.0 RECORDS

No Records are generated by this procedure.

**EverBridge Options – Telephone**

1. **CLICK** on the telephone button. .... ☐
2. **FOLLOW** instructions provided in the “pop-up” window to record a message.  
..... ☐
3. **RETURN** to the web application to continue creating the message by  
selecting “READY” ..... ☐

**EverBridge Options – Upload Message**

1. **CLICK** on the “Upload Message” button..... ☐
2. **CLICK** on “Browse”..... ☐
3. **SELECT** the appropriate .wav file from the “Choose file” window by double clicking on file name..... ☐
4. **SELECT** “UPLOAD”..... ☐

### Message Delivery Options Definitions

**Confirm** - By default the message will be delivered with confirmation required. Un-checking the confirm box delivers a message without request for confirmation to all selected contact paths and eliminates the 10-digit call back number from being displayed to recipient.

**Escalate** - Checking this box delivers a message with Escalation to additional members as defined in the chosen member's profile.

**Broadcast Duration** - Member can choose duration for the broadcast. Emergency broadcast defaults to 30 minutes, Standard broadcast defaults to two hours.

**Contact Cycles** - Select the number of times you would like the message to cycle through each delivery method. The message will cycle through all the delivery methods selected until the message has been confirmed, all the cycles have been exhausted, or when the duration time ends.

**Interval Between Delivery Methods** - Select the interval (up to three min) that you choose to occur between the chosen delivery methods.

**Interval Between Cycles** - Select the interval (up to one hr) that you choose to occur between contact cycles.

**Require PIN to hear Message** - Checking this option will require the member input PIN # to hear the message. (Note: The PIN # is defined by the organization leader at the member level. The option is viewable when turned on.)

**Voice Mail Preference** - Select: No Message, Message Only, or Message with Confirmation Info to be included with Voice Mail option.

**Send Attachment(s) to** - If attachments have been added to message, choose where you would like the attachments sent: E-mail and Fax, E-mail only, or Fax Only.

**Delivery Methods** - Select the message delivery methods for your broadcast. When a text message is created with no recorded voice, only the text path checkboxes will be checked. To convert your text to speech you must select the desired voice paths, when sending your notification you will be prompted to convert text to voice. (Note: A recorded message without any text will only display voice devices.)

**Broadcast Results Delivery Method** - Broadcast results can be delivered via E-mail and/or fax by checking the appropriate checkbox, entering the desired E-mail address, and/or Fax number. (You have the option to send the broadcast results to any E-mail and/or fax #. Note: Broadcast results via fax will show a summary of the broadcast.)

**Call Transfer** - When a recipient chooses call transfer, the recipient is forwarded to another phone number that has been programmed into the polling response.

**Data Input** - This allows the recipient to respond with **numeric only** data to the questions that are being polled such as: phone #, date, time.

**Summary of Changes**  
**EMG-NGGC-0004 Rev. 3**  
**PRR 617154**

SECTION/STEP	CHANGES
9.1.1	Removed program location description for WIN7 implementation. <b>(Editorial)</b>

**EMG-NGGC-0004 Rev. 4**  
**PRR 615736, CR 619320**

SECTION/STEP	CHANGES
9.1.1	Added removed EverBridge program instructions from previous revision and added location description for Windows 7 Desktop for WIN7 implementation. <b>(Editorial)</b>

**Enclosure 2e**

**EMG-NGGC-0005,**

***Activation of the Emergency Response Organization Notification System,***

**Revision 3**

NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

**EMG-NGGC-0005**

***ACTIVATION OF THE EMERGENCY RESPONSE  
ORGANIZATION NOTIFICATION SYSTEM***

REVISION 3



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## 1.0 PURPOSE

This procedure provides guidance for activating the Emergency Response Organization Notification System for the Nuclear Generation Group. The Emergency Notification System will be used to notify the Emergency Response Organization during an emergency, drill, exercise, or test.

## 2.0 REFERENCES

- 2.1 EMG-NGGC-0004, Maintenance of the Emergency Response Organization Notification System
- 2.2 EMG-NGGC-1000, Fleet Conduct of Emergency Preparedness
- 2.3 EPNOT-01, [RNP] CR/EOF Emergency Communicator
- 2.4 EPPRO-02, [RNP] Maintenance and Testing
- 2.5 PEP-310, [HNP] Notifications and Communications
- 2.6 EPM-410, [HNP] Communication and Facility Performance Test
- 2.7 EM-206,(EM0206) [CR3] Emergency Plan Roster Notification
- 2.8 OPEP-02.6.21, [BNP] Emergency Communicator
- 2.9 OPEP-03.1.3, [BNP] Use of Communication Equipment
- 2.10 OPEP-02.1.1, [BNP] Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency
- 2.11 **[R1]** NOCS 100521, Emergency Preparedness On-Site and Off-site communications
- 2.12 **[R2]** NOCS 100533, Automated Dialing Capability for Fire Brigade Responders

### **3.0 RESPONSIBILITIES**

- 3.1 The Site Emergency Coordinator (SEC) is responsible for determining:
  - 3.1.1 When the Emergency Response Organization (ERO) is to be notified,
  - 3.1.2 Which facilities are to be activated, unless decision is made by EOF Director.
  - 3.1.3 The preferred methods of notification:
    - 1. LAN/Computer
    - 2. Interactive Voice Response (IVR)
    - 3. Live EverBridge Operator
- 3.2 The emergency notification scenario title and number to be provided as part of the notification.
- 3.3 Security is responsible for activating the ERO Notification System as directed by the SEC, unless the event is related to a security condition.
  - 3.3.1 If security is unable to activate the ERO Notification System due to the nature of the event, responsibility of activation shall be returned to Operations.
- 3.4 In the event of a security condition, Operations will perform the necessary ERO notifications.
- 3.5 The Emergency Preparedness staff is responsible for:
  - 3.5.1 Interface with the vendor(s) providing the notification service.
  - 3.5.2 Maintaining the Emergency Response Organization contact information.
  - 3.5.3 Maintaining the scenario and message contents.

## **4.0 DEFINITIONS**

- 4.1 Aware – Notification software application used by EverBridge.
- 4.2 EverBridge – Company that hosts the software and website used for notification.
- 4.3 Group – Set of defined personnel to be notified.
- 4.4 Interactive Voice Response (IVR) – One of the options EverBridge provides in the notification of ERO personnel. The system will provide a series of prompts for an individual to respond to via telephone. Once the responses are validated by EverBridge and the correct emergency notification scenario is provided, the notification will be transmitted as directed.
- 4.5 Live EverBridge Operator – One of the options EverBridge provides in the notification of ERO personnel. Using a telephone, site personnel will request an employee of EverBridge to activate the ERO. The EverBridge personnel will in turn request member I.D. and scenario information from the caller to initiate the notification process.
- 4.6 Password Card – Document which contains the site specific member I.D.'s and passwords required to activate the ERO using the EverBridge notification system.
- 4.7 Scenario – collection of message combinations used to notify ERO. A group of messages sent to the ERO to activate in an emergency.
- 4.8 Site Emergency Coordinator (SEC) – used as a generic term to represent the ERO position acting as the emergency coordinator for the site.

## **5.0 PREREQUISITES**

- 5.1 An emergency event requiring activation of the ERO.
- 5.2 A drill, exercise, or test is being conducted which involves notification of the ERO.

## **6.0 PRECAUTIONS AND LIMITATIONS**

- 6.1 The Emergency Response Organization Notification System (EverBridge) uses pre-programmed messages to contact pre-established ERO personnel groups. These messages cannot be modified without the permission of the site Emergency Preparedness organization.
- 6.2 EverBridge is the preferred method of ERO notification. If this system is unavailable, site specific procedures and equipment should be used to provide notification. A list of these procedures is provided in the Reference Section (Section 2.0).
- 6.3 A LAN or wireless internet connection is required only if notification is made via the EverBridge website. It is NOT needed if IVR or a Live EverBridge Operator is used.
- 6.4 If notification occurs using a Live EverBridge Operator, the operator will ask a series of questions concerning the notification. These questions may vary from the script provided in Attachment 7. However, the intent and the critical responses will remain consistent.
- 6.5 Passwords will NOT be provided in this procedure to ensure the information cannot be accessed inappropriately. Instead, passwords are located on password cards provided to responsible personnel.
- 6.6 The SEC should indicate the preferred method of notification. The options are:
  - LAN Computer Activation
  - EverBridge Interactive Voice Response (IVR) Telephone Activation
  - Live EverBridge Operator Telephone Activation
- 6.7 Acronyms and abbreviations will be spoken as words by the IVR. Listen closely to ensure the correct option is selected.

## **7.0 SPECIAL TOOLS AND EQUIPMENT**

N/A

## **8.0 ACCEPTANCE CRITERIA**

N/A

## 9.0 INSTRUCTIONS

### 9.1 Use of the EverBridge Notification System

#### CAUTION

The Scenario Title must correspond to the Scenario Number Provided by the SEC, otherwise the incorrect notification will be activated.

9.2 The SEC will direct activation of the ERO using the Emergency Response Organization Notification System. The Scenario number and preferred method for notification will be provided. Scenario numbers are identified in the following attachments.

- Attachment 1 - BNP
- Attachment 2 – CR3
- Attachment 3 – HNP
- Attachment 4 – RNP

9.3 **IF** the system is locked, **THEN INITIATE** system using alternate notification methods described in this procedure (LAN/Computer, Interactive Voice Response, or Live Operator) or immediately transition to back up ERO notification methods.

9.4 **REFER** to Attachment 5, to activate the ERO using a LAN computer.

9.5 **REFER** to Attachment 6, to activate the ERO using the EverBridge Interactive Voice Response (IVR) method.

9.6 **REFER** to Attachment 7, to activate the ERO using a Live EverBridge Operator.

## 10.0 RECORDS

Documents generated by this procedure are NOT required to be retained.

## 11.0 ATTACHMENTS

1. BNP Emergency Notification Scenarios
2. CR3 Emergency Notification Scenarios
3. HNP Emergency Notification Scenarios
4. RNP Emergency Notification Scenarios
5. Using a LAN Computer to Activate the ERO
6. Using the EverBridge Interactive Voice Response to Activate the ERO
7. Using the Live EverBridge Operator to Activate the ERO

ATTACHMENT 1  
Sheet 1 of 2

**BNP Emergency Notification Scenarios**

<b>EMERGENCY CONDITIONS</b>		
<b>SCENARIO TITLE</b>	<b>SCENARIO NUMBER</b>	<b>APPLICABILITY</b>
1 U E Standby	31	Unusual Event EMERGENCY
2 U E Activate All. No JIC	44	Unusual Event EMERGENCY
3 U E Activate All Facilities	24	Unusual Event EMERGENCY
4 Alert Activate All Facilities. No JIC	34	Alert EMERGENCY
5 Alert Activate All Facilities	33	Alert EMERGENCY
6 Site Area Emergency Activate All	35	Site Area Emergency EMERGENCY
7 General Emergency Activate All	36	General Emergency EMERGENCY
8 Security Event Activate A E F and J I C	43	Security Event EMERGENCY
9 Notification Error	46	If wrong scenario was sent
10 Activate JIC	50	Activate the Joint Information Center (JIC) Only

ATTACHMENT 1  
Sheet 2 of 2

**BNP Emergency Notification Scenarios**

<b>Drill Conditions &amp; Information</b>		
<b>SCENARIO TITLE</b>	<b>SCENARIO NUMBER</b>	<b>APPLICABILITY</b>
9.0 Drill U E Standby	32	Drill
9.1 Drill U E Activate All. No JIC	4	Drill
9.2 Drill U E Activate All Facilities	23	Drill
9.3 Drill Alert Activate All Facilities	37	Drill
9.4 Drill Alert Activate All. No JIC	38	Drill
9.5 Drill S A E Activate All Facilities	39	Drill
9.6 Drill G E Activate All Facilities	40	Drill
9.7 Drill Security Event Act A E F and JIC	6	Drill
9.8 Threat Level Increase (Orange)	8	Information
9.9 Threat Level Increase (Red)	42	Information
Forced Outage	30	Information
Post Storm Staffing	20	Information
Test	41	Information
ERO Notification Drill 2	52	Drill
Notification Error	46	If wrong scenario was sent
Drill Activate JIC	49	Drill
Drill Alert Activate All No JIC 01	51	Drill

ATTACHMENT 2  
Sheet 1 of 3  
**CR3 Emergency Notification Scenarios**  
**[R1] [R2]**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY
1.	Notification Error	Retraction of any activation message sent in error
2.	Unusual Event – ERO Standby	Unusual Event declared. Notify ERO to assume a heightened state of awareness in anticipation of emergency escalation.
3.	Discretionary – TSC/OSC	At the discretion of the Emergency Coordinator, activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> </ul>
4.	Discretionary – TSC/OSC/EOF/ENC	At the discretion of the Emergency Coordinator, activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
5.	Alert (Refer to Scenario 8 if activation of remote facilities is required.)	Alert declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>



ATTACHMENT 2

Sheet 2 of 3

**CR3 Emergency Notification Scenarios**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY
6.	Site Area Emergency (Refer to Scenario 9 if activation of remote facilities is required.)	Site Area Emergency declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
7.	General Emergency (Refer to Scenario 10 if activation of remote facilities is required.)	General Emergency declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
8.	Alert (Remote Facilities)	Alert declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Remote Technical Support Center</li> <li>• Remote Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
9.	Site Area Emergency (Remote Facilities)	Site Area Emergency declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Remote Technical Support Center</li> <li>• Remote Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>

ATTACHMENT 2  
Sheet 3 of 3  
**CR3 Emergency Notification Scenarios**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY
10.	General Emergency (Remote Facilities)	General Emergency declared. Activate the following facilities: <ul style="list-style-type: none"><li>• Remote Technical Support Center</li><li>• Remote Operational Support Center</li><li>• Emergency Operations Facility</li><li>• Emergency News Center</li></ul>
11.	Fire Brigade Support to SAB	Event requiring off-shift Fire Brigade support to report to the Site Admin Building. (Example: Large-area fire)
12.	Fire Brigade Support to EOF	Event requiring off-shift Fire Brigade support to report to the Emergency Operations Facility. (Example: Large-area fire)
13.	Event Termination	Plant conditions no longer require ERO to stand by or to report as determined by Emergency Coordinator or EOF Director.

ATTACHMENT 3  
Sheet 1 of 5  
**HNP Emergency Notification Scenarios**

**NON-SECURITY EVENTS**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
<b>20</b>	<b>UNUSUAL EVENT – Notification Only</b>	<b>EMERGENCY / ALL CALL</b>	<b>Unusual Event</b>
<b>21</b>	<b>UNUSUAL EVENT – Pre Staffing Facilities</b>	<b>EMERGENCY / ALL CALL</b>	<b>Unusual Event</b>
<b>22</b>	<b>ALERT</b>	<b>EMERGENCY / ALL CALL</b>	<b>Alert</b>
<b>23</b>	<b>SITE AREA EMERGENCY</b>	<b>EMERGENCY / ALL CALL</b>	<b>Site Area Emergency</b>
<b>24</b>	<b>GENERAL EMERGENCY</b>	<b>EMERGENCY / ALL CALL</b>	<b>General Emergency</b>
<b>25</b>	<b>EVENT TERMINATION</b>	<b>Event Termination / All Call</b>	<b>Any Event</b>

ATTACHMENT 3  
Sheet 2 of 5  
**HNP Emergency Notification Scenarios**

**SECURITY EVENTS**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
<b>30</b>	<b>SEC UNUSUAL EVENT – Notification Only</b>	<b>Security Emergency / All Call</b>	<b>Unusual Event</b>
<b>31</b>	<b>SEC UNUSUAL EVENT – Pre Staffing Facilities</b>	<b>Security Emergency / All Call</b>	<b>Unusual Event</b>
<b>32</b>	<b>SEC ALERT</b>	<b>Security Emergency / All Call</b>	<b>Alert</b>
<b>33</b>	<b>SEC SITE AREA EMERGENCY</b>	<b>Security Emergency / All Call</b>	<b>Site Area Emergency</b>
<b>34</b>	<b>SEC GENERAL EMERGENCY</b>	<b>Security Emergency / All Call</b>	<b>General Emergency</b>
<b>35</b>	<b>SEC EVENT TERMINATION</b>	<b>Security Event Termination / All Call</b>	<b>Any Event</b>

ATTACHMENT 3  
Sheet 3 of 5  
**HNP Emergency Notification Scenarios**

**Drill – Non Security Events**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
40	Drill - UNUSUAL EVENT – Notification Only	Drill / All Call	Unusual Event
41	Drill - UNUSUAL EVENT – Pre Staffing Facilities	Drill / All Call	Unusual Event
42	Drill - ALERT	Drill / All Call	Alert
43	Drill – SITE AREA EMERGENCY	Drill / All Call	Site Area Emergency
44	Drill – GENERAL EMERGENCY	Drill / All Call	General Emergency
45	Drill - EVENT TERMINATION	Drill Event Termination / All Call	Any Event

ATTACHMENT 3  
Sheet 4 of 5  
**HNP Emergency Notification Scenarios**

**Drill – Security Events**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
50	SEC Drill – UE - Notification Only	Drill Security Emergency / All Call	Unusual Event
51	SEC Drill – UE – Pre Staffing Facilities	Drill Security Emergency / All Call	Unusual Event
52	SEC Drill - ALERT	Drill Security Emergency / All Call	Alert
53	SEC Drill – SITE AREA EMERGENCY	Drill Security Emergency / All Call	Site Area Emergency
54	SEC Drill – GENERAL EMERGENCY	Drill Security Emergency / All Call	General Emergency
55	SEC Drill - EVENT TERMINATION	Drill Security Emergency / All Call	Any Event

ATTACHMENT 3

Sheet 5 of 5

**HNP Emergency Notification Scenarios**

**Administrative and Testing**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
60	Testing of EverBridge Notification System	System Testing / Selective Individuals	Testing
61	Emergency Response Facility Staffing	Response Staffing / All Call	ERF Staffing
62	Security EverBridge Training Exercise	System Testing / Selective Individuals	Testing

ATTACHMENT 4  
Sheet 1 of 6  
**RNP Emergency Notification Scenarios**

**EMERGENCY CONDITIONS**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
1	UNUSUAL EVENT – ACTIVATION * (ALL CALL)	EMERGENCY / ALL CALL	Unusual Event
2	UNUSUAL EVENT – NO ACTIVATION * (ALL CALL)	EMERGENCY / ALL CALL	Unusual Event
3	UNUSUAL EVENT – ACTIVATION - R E R F * (ALL CALL)	EMERGENCY / ALL CALL	Unusual Event
4	UNUSUAL EVENT – ACTIVATION	EMERGENCY / PAGER ONLY	Unusual Event
5	UNUSUAL EVENT – NO ACTIVATION	EMERGENCY / PAGER ONLY	Unusual Event
6	UNUSUAL EVENT – ACTIVATION - R E R F	EMERGENCY / PAGER ONLY	Unusual Event
7	ALERT – ACTIVATION * (ALL CALL)	EMERGENCY / ALL CALL	Alert
8	ALERT – ACTIVATION – R E R F * (ALL CALL)	EMERGENCY / ALL CALL	Alert



ATTACHMENT 4  
Sheet 2 of 6  
**RNP Emergency Notification Scenarios**

**EMERGENCY CONDITIONS**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
9	ALERT – ACTIVATION	EMERGENCY / PAGER ONLY	Alert
10	ALERT – ACTIVATION - R E R F	EMERGENCY / PAGER ONLY	Alert
11	SITE AREA EMERGENCY– ACTIVATION * (ALL CALL)	EMERGENCY / ALL CALL	Site Area Emergency
12	SITE AREA EMERGENCY – ACTIVATION - R E R F * (ALL CALL)	EMERGENCY / ALL CALL	Site Area Emergency
13	SITE AREA EMERGENCY – ACTIVATION	EMERGENCY / PAGER ONLY	Site Area Emergency
14	SITE AREA EMERGENCY – ACTIVATION – R E R F	EMERGENCY / PAGER ONLY	Site Area Emergency
15	GENERAL EMERGENCY – ACTIVATION * (ALL CALL)	EMERGENCY / ALL CALL	General Emergency
16	GENERAL EMERGENCY – ACTIVATION – R E R F * (ALL CALL)	EMERGENCY / ALL CALL	General Emergency
17	GENERAL EMERGENCY – ACTIVATION	EMERGENCY / PAGER ONLY	General Emergency
18	GENERAL EMERGENCY – ACTIVATION – R E R F	EMERGENCY / PAGER ONLY	General Emergency

ATTACHMENT 4  
Sheet 3 of 6  
**RNP Emergency Notification Scenarios**  
**EMERGENCY CONDITIONS**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
19	PAGER FAILURE * (ALL CALL)	EMERGENCY / ALL CALL	Pager Failure
20	PAGERS RETURNED TO SERVICE * (ALL CALL)	EMERGENCY / ALL CALL	Pagers Returned To Service
21	FIRE BRIGADE – REPORT TO STATION 8	EMERGENCY / SELECTIVE CALL	Fire Brigade
22	FIRE BRIGADE – REPORT TO R N P	EMERGENCY / SELECTIVE CALL	Fire Brigade
23	TERMINATION OF EVENT	EMERGENCY / PAGER ONLY	Termination Of Event

**RNP Emergency Notification Scenario****Drill Conditions**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
24	Drill – UNUSUAL EVENT – ACTIVATION * (ALL CALL)	Drill / All Call	Unusual Event
25	DRILL - UNUSUAL EVENT – NO ACTIVATION * (ALL CALL)	Drill / All Call	Unusual Event
26	DRILL – UNUSUAL EVENT – ACTIVATION - R E R F * (ALL CALL)	Drill / All Call	Unusual Event
27	DRILL - UNUSUAL EVENT - ACTIVATION	Drill / Pager Only	Unusual Event
28	DRILL – UNUSUAL EVENT - NO ACTIVATION	Drill / Pager Only	Unusual Event
29	DRILL – UNUSUAL EVENT - ACTIVATION - R E R F	Drill / Pager Only	Unusual Event
30	DRILL - ALERT – ACTIVATION * (ALL CALL)	Drill / All Call	Alert
31	DRILL - ALERT - ACTIVATION - R E R F * (ALL CALL)	Drill / All Call	Alert

ATTACHMENT 4  
Sheet 5 of 6  
**RNP Emergency Notification Scenario**

**Drill Conditions**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
32	DRILL - ALERT - ACTIVATION	Drill / Pager Only	Alert
33	DRILL - ALERT – ACTIVATION - R E R F	Drill / Pager Only	Alert
34	DRILL – SITE AREA EMERGENCY – ACTIVATION * (ALL CALL)	Drill / All Call	Site Area Emergency
35	DRILL – SITE AREA EMERGENCY – ACTIVATION – R E R F * (ALL CALL)	Drill / All Call	Site Area Emergency
36	DRILL – SITE AREA EMERGENCY - ACTIVATION	Drill / Pager Only	Site Area Emergency
37	DRILL – SITE AREA EMERGENCY – ACTIVATION – R E R F	Drill / Pager Only	Site Area Emergency
38	DRILL – GENERAL EMERGENCY – ACTIVATION * (ALL CALL)	Drill / All Call	General Emergency
39	DRILL – GENERAL EMERGENCY – ACTIVATION – R E R F * (ALL CALL)	Drill / All Call	General Emergency
40	DRILL – GENERAL EMERGENCY - ACTIVATION	Drill / Pager Only	General Emergency

ATTACHMENT 4  
Sheet 6 of 6  
**RNP Emergency Notification Scenario**

**Drill Conditions**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
41	DRILL – GENERAL EMERGENCY - ACTIVATION – R E R F	Drill / Pager Only	General Emergency
42	DRILL – AUGMENTATION * (ALL CALL)	Drill / All Call	Augmentation Drill
43	DRILL – QUARTERLY COMMUNICATION * (ALL CALL)	Drill / All Call	Quarterly Test
44	DRILL – ERO TRAINING (EP USE ONLY) * (ALL CALL)	Drill / All Call	ERO Training
45	DRILL – CONTROL ROOM PRACTICE * (ALL CALL)	Drill / All Call	CR Practice
46	DRILL – SIMULATOR PRACTICE * (ALL CALL)	Drill / All Call	Simulator Practice
47	DRILL – TERMINATION	Drill / Pager Only	Termination Of Drill
48	E P - THREAT LEVEL INCREASE – ORANGE	Notice to Emergency Preparedness / Pager Only	National Terror Threat Level Increase
49	E P - THREAT LEVEL INCREASE – RED	Notice to Emergency Preparedness / Pager Only	National Terror Threat Level Increase

- 1) The Remote Emergency Response Facility (RERF) should be activated for the following events:
  - a) A security condition has made the site inaccessible.
  - b) The EOF/TSC facilities are NOT habitable due to flooding, fire, loss of power, etc.
  - c) If an extended evacuation is made as part of the initial Protective Action Recommendation (PAR).
  - d) As directed by the SEC or ERM.
- 2) (\*) Denotes (ALL CALL) in EverBridge Scenario Titles located in EverBridge database.

## ATTACHMENT 5

Sheet 1 of 1

### Using a LAN Computer to Activate the ERO

**NOTE:** This method is used to activate the ERO using the EverBridge website and any available LAN computer.

- 1) **LOG** onto the Emergency Response Organization Notification System, EverBridge **OR OPEN** an internet browser and type "www.everbridge.net".
- 2) **TYPE** the site identification from the list below (NOT case sensitive) in the "Member ID" field of the initial login screen.
  - a. For BNP, **TYPE** in "BNPactivation"
  - b. For CR3, **TYPE** in "CR3activation"
  - c. For HNP, **TYPE** in "HNPactivation"
  - d. For RNP, **TYPE** in "RNPactivation"
- 3) **ENTER** site specific Password from the "Password Card."
- 4) **SELECT "GO" OR PRESS "Enter"** on the keyboard.
- 5) **SELECT "Scenario Manager"** from left side of the screen.
- 6) **SELECT "Send Scenario" under "Scenario Manager."**
- 7) **LOCATE AND CONFIRM** the "Scenario Number" and "Scenario Title" provided by the SEC on the "Send Scenarios" screen, use the "Previous" and "Next" cursors to scroll through the scenario list as needed.
- 8) **CLICK** the desired "Scenario Title" in EverBridge once you have located and confirmed that the "Scenario Number" and "Scenario Title" provided by the SEC are in alignment.

**NOTE:** A satellite dish animation will appear on the screen to indicate transmission of the message.

- 9) **SELECT "Send Message"** at bottom of the "list unscheduled messages" screen.

## ATTACHMENT 6

Sheet 1 of 1

### Using the EverBridge Interactive Voice Response to Activate the ERO

**NOTE:** The following steps can be used to activate EverBridge mass communications system via telephone. The automated system will require the following information to activate and ask for responses to the following queries.

- 1) **DIAL** EverBridge at 9-1-888-440-4911
- 2) **LISTEN** to the IVR command **AND FOLLOW** the instructions:
  - a) *"Please enter your Member ID followed by the '#' sign."*
    - i) For BNP, **ENTER** "132508351" **#**
    - ii) For CR3, **ENTER** "132528221" **#**
    - iii) For HNP, **ENTER** "132508331" **#**
    - iv) For RNP, **ENTER** "132508341" **#**
  - b) *"Please enter your Password followed by the '#' sign."*
    - i) **ENTER** site specific password. See Password Card for site password.

### CAUTION

Upon completion of the following steps, activation of the ERO will occur.

- 3) To launch a broadcast scenario now, **PRESS** the number "3".
- 4) To select your scenario by number, **PRESS** the number "1".
- 5) *"Please enter your scenario number followed by the '#' sign."*
  - a) For example; **"10" "#"**.
- 6) Voice will state title of the scenario. **VERIFY** this is the correct entry.
- 7) To select this scenario, **PRESS** **"#"** key, otherwise press **"\*"**.
- 8) "To launch this scenario now, **PRESS** the number "1".
- 9) **END** call

ATTACHMENT 7

Sheet 1 of 1

**Using the Live EverBridge Operator to Activate the ERO**

**NOTE:** The following steps can be used to activate the EverBridge mass communications system via telephone and the Live EverBridge Operator.

- 1.) **CALL** the live EverBridge operator at 9-1-877-220-4911. You will hear, *"Thank you, an EverBridge Operator will be with you momentarily."*

**NOTE:** The EverBridge Operator may use variations of the questions below.

- 2.) **QUESTION:** The agent will ask for your **Organization Name:**  
**ANSWER:** **SEE PASSWORD INFORMATION**
- 3.) **QUESTION:** The agent will ask for your **Member ID:**  
**ANSWER:** **SEE PASSWORD INFORMATION**
- 4.) **QUESTION:** For authentication purposes, the agent will ask you your **Hint Question:** *"What is your city of birth?"*  
**ANSWER:** **SEE PASSWORD INFORMATION**
- 5.) **QUESTION:** The agent should then ask, *"How may I help you?"*

**NOTE:** Ensure that the scenario number provided by the SEC and scenario name listed in EMG-NGGC-0005 are in alignment.

**ANSWER:** **"I WOULD LIKE TO SEND AN EMERGENCY SCENARIO USING THE FOLLOWING SCENARIO NUMBER:"** Provide the Live EverBridge Operator with the scenario number that has been provided to you by the SEC.

- 6.) **QUESTION:** The Live EverBridge Operator will then **CONFIRM** the Scenario Number (and Scenario Name) provided, *"Is this the correct Scenario Number?"*

**ANSWER:** If the Scenario Number and Name are correct – **"YES."**  
If the scenario number and name are incorrect – **"NO."**  
Provide the Live EverBridge Operator with the correct scenario number that has been provided to you by the SEC before proceeding.

- 7.) **QUESTION:** The Live EverBridge Operator will then confirm, *"Would you like to send the notification now?"*

**ANSWER:** **"SEND NOTIFICATION NOW."** The Live EverBridge Operator will then provide you with the Message Broadcast ID number for tracking purposes.



## REVISION SUMMARY

PRR 617154

SECTION	REVISION COMMENTS
Attachment 5 step 1).	Removed program location description for WIN7 implementation. (Editorial)

**Enclosure 2f**

**EMG-NGGC-0005,**

***Activation of the Emergency Response Organization Notification System,***

**Revision 4**

NUCLEAR GENERATION GROUP

STANDARD PROCEDURE

VOLUME 99

BOOK/PART 99

**EMG-NGGC-0005**

***ACTIVATION OF THE EMERGENCY RESPONSE  
ORGANIZATION NOTIFICATION SYSTEM***

REVISION 4



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## 1.0 PURPOSE

This procedure provides guidance for activating the Emergency Response Organization Notification System for the Nuclear Generation Group. The Emergency Notification System will be used to notify the Emergency Response Organization during an emergency, drill, exercise, or test.

## 2.0 REFERENCES

- 2.1 EMG-NGGC-0004, Maintenance of the Emergency Response Organization Notification System
- 2.2 EMG-NGGC-1000, Fleet Conduct of Emergency Preparedness
- 2.3 EPNOT-01, [RNP] CR/EOF Emergency Communicator
- 2.4 EPPRO-02, [RNP] Maintenance and Testing
- 2.5 PEP-310, [HNP] Notifications and Communications
- 2.6 EPM-410, [HNP] Communication and Facility Performance Test
- 2.7 EM-206,(EM0206) [CR3] Emergency Plan Roster Notification
- 2.8 OPEP-02.6.21, [BNP] Emergency Communicator
- 2.9 OPEP-03.1.3, [BNP] Use of Communication Equipment
- 2.10 OPEP-02.1.1, [BNP] Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency
- 2.11 [R1] NOCS 100521, Emergency Preparedness On-Site and Off-site communications
- 2.12 [R2] NOCS 100533, Automated Dialing Capability for Fire Brigade Responders

### 3.0 RESPONSIBILITIES

- 3.1 The Site Emergency Coordinator (SEC) is responsible for determining:
  - 3.1.1 When the Emergency Response Organization (ERO) is to be notified,
  - 3.1.2 Which facilities are to be activated, unless decision is made by EOF Director.
  - 3.1.3 The preferred methods of notification:
    - 1. LAN/Computer
    - 2. Interactive Voice Response (IVR)
    - 3. Live EverBridge Operator
- 3.2 The emergency notification scenario title and number to be provided as part of the notification.
- 3.3 Security is responsible for activating the ERO Notification System as directed by the SEC, unless the event is related to a security condition.
  - 3.3.1 If security is unable to activate the ERO Notification System due to the nature of the event, responsibility of activation shall be returned to Operations.
- 3.4 In the event of a security condition, Operations will perform the necessary ERO notifications.
- 3.5 The Emergency Preparedness staff is responsible for:
  - 3.5.1 Interface with the vendor(s) providing the notification service.
  - 3.5.2 Maintaining the Emergency Response Organization contact information.
  - 3.5.3 Maintaining the scenario and message contents.

## **4.0 DEFINITIONS**

- 4.1 Aware – Notification software application used by EverBridge.
- 4.2 EverBridge – Company that hosts the software and website used for notification.
- 4.3 Group – Set of defined personnel to be notified.
- 4.4 Interactive Voice Response (IVR) – One of the options EverBridge provides in the notification of ERO personnel. The system will provide a series of prompts for an individual to respond to via telephone. Once the responses are validated by EverBridge and the correct emergency notification scenario is provided, the notification will be transmitted as directed.
- 4.5 Live EverBridge Operator – One of the options EverBridge provides in the notification of ERO personnel. Using a telephone, site personnel will request an employee of EverBridge to activate the ERO. The EverBridge personnel will in turn request member I.D. and scenario information from the caller to initiate the notification process.
- 4.6 Password Card – Document which contains the site specific member I.D.'s and passwords required to activate the ERO using the EverBridge notification system.
- 4.7 Scenario – collection of message combinations used to notify ERO. A group of messages sent to the ERO to activate in an emergency.
- 4.8 Site Emergency Coordinator (SEC) – used as a generic term to represent the ERO position acting as the emergency coordinator for the site.

## **5.0 PREREQUISITES**

- 5.1 An emergency event requiring activation of the ERO.
- 5.2 A drill, exercise, or test is being conducted which involves notification of the ERO.

## **6.0 PRECAUTIONS AND LIMITATIONS**

- 6.1 The Emergency Response Organization Notification System (EverBridge) uses pre-programmed messages to contact pre-established ERO personnel groups. These messages cannot be modified without the permission of the site Emergency Preparedness organization.
- 6.2 EverBridge is the preferred method of ERO notification. If this system is unavailable, site specific procedures and equipment should be used to provide notification. A list of these procedures is provided in the Reference Section (Section 2.0).
- 6.3 A LAN or wireless internet connection is required only if notification is made via the EverBridge website. It is NOT needed if IVR or a Live EverBridge Operator is used.
- 6.4 If notification occurs using a Live EverBridge Operator, the operator will ask a series of questions concerning the notification. These questions may vary from the script provided in Attachment 7. However, the intent and the critical responses will remain consistent.
- 6.5 Passwords will NOT be provided in this procedure to ensure the information cannot be accessed inappropriately. Instead, passwords are located on password cards provided to responsible personnel.
- 6.6 The SEC should indicate the preferred method of notification. The options are:
  - LAN Computer Activation
  - EverBridge Interactive Voice Response (IVR) Telephone Activation
  - Live EverBridge Operator Telephone Activation
- 6.7 Acronyms and abbreviations will be spoken as words by the IVR. Listen closely to ensure the correct option is selected.

## **7.0 SPECIAL TOOLS AND EQUIPMENT**

N/A

## **8.0 ACCEPTANCE CRITERIA**

N/A



## 9.0 INSTRUCTIONS

### 9.1 Use of the EverBridge Notification System

#### CAUTION

The Scenario Title must correspond to the Scenario Number Provided by the SEC, otherwise the incorrect notification will be activated.

9.2 The SEC will direct activation of the ERO using the Emergency Response Organization Notification System. The Scenario number and preferred method for notification will be provided. Scenario numbers are identified in the following attachments:

- Attachment 1 - BNP
- Attachment 2 – CR3
- Attachment 3 – HNP
- Attachment 4 – RNP

9.3 IF the system is locked, **THEN INITIATE** system using alternate notification methods described in this procedure (LAN/Computer, Interactive Voice Response, or Live Operator) or immediately transition to back up ERO notification methods.

9.4 **REFER** to Attachment 5, to activate the ERO using a LAN computer.

9.5 **REFER** to Attachment 6, to activate the ERO using the EverBridge Interactive Voice Response (IVR) method.

9.6 **REFER** to Attachment 7, to activate the ERO using a Live EverBridge Operator.

## 10.0 RECORDS

Documents generated by this procedure are NOT required to be retained.

## 11.0 ATTACHMENTS

1. BNP Emergency Notification Scenarios
2. CR3 Emergency Notification Scenarios
3. HNP Emergency Notification Scenarios
4. RNP Emergency Notification Scenarios
5. Using a LAN Computer to Activate the ERO
6. Using the EverBridge Interactive Voice Response to Activate the ERO
7. Using the Live EverBridge Operator to Activate the ERO

ATTACHMENT 1  
Sheet 1 of 2

**BNP Emergency Notification Scenarios**

<b>EMERGENCY CONDITIONS</b>		
<b>SCENARIO TITLE</b>	<b>SCENARIO NUMBER</b>	<b>APPLICABILITY</b>
1 U E Standby	31	Unusual Event EMERGENCY
2 U E Activate All. No JIC	44	Unusual Event EMERGENCY
3 U E Activate All Facilities	24	Unusual Event EMERGENCY
4 Alert Activate All Facilities. No JIC	34	Alert EMERGENCY
5 Alert Activate All Facilities	33	Alert EMERGENCY
6 Site Area Emergency Activate All	35	Site Area Emergency EMERGENCY
7 General Emergency Activate All	36	General Emergency EMERGENCY
8 Security Event Activate A E F and J I C	43	Security Event EMERGENCY
9 Notification Error	46	If wrong scenario was sent
10 Activate JIC	50	Activate the Joint Information Center (JIC) Only

ATTACHMENT 1

Sheet 2 of 2

**BNP Emergency Notification Scenarios**

<b>Drill Conditions &amp; Information</b>		
<b>SCENARIO TITLE</b>	<b>SCENARIO NUMBER</b>	<b>APPLICABILITY</b>
9.0 Drill U E Standby	32	Drill
9.1 Drill U E Activate All. No JIC	4	Drill
9.2 Drill U E Activate All Facilities	23	Drill
9.3 Drill Alert Activate All Facilities	37	Drill
9.4 Drill Alert Activate All. No JIC	38	Drill
9.5 Drill S A E Activate All Facilities	39	Drill
9.6 Drill G E Activate All Facilities	40	Drill
9.7 Drill Security Event Act A E F and JIC	6	Drill
9.8 Threat Level Increase (Orange)	8	Information
9.9 Threat Level Increase (Red)	42	Information
Forced Outage	30	Information
Post Storm Staffing	20	Information
Test	41	Information
ERO Notification Drill 2	52	Drill
Notification Error	46	If wrong scenario was sent
Drill Activate JIC	49	Drill
Drill Alert Activate All No JIC 01	51	Drill

ATTACHMENT 2

Sheet 1 of 3

**CR3 Emergency Notification Scenarios**

[R1] [R2]

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY
1.	Notification Error	Retraction of any activation message sent in error
2.	Unusual Event – ERO Standby	Unusual Event declared. Notify ERO to assume a heightened state of awareness in anticipation of emergency escalation.
3.	Discretionary – TSC/OSC	At the discretion of the Emergency Coordinator, activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> </ul>
4.	Discretionary – TSC/OSC/EOF/ENC	At the discretion of the Emergency Coordinator, activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
5.	Alert  (Refer to Scenario 8 if activation of remote facilities is required.)	Alert declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>

ATTACHMENT 2

Sheet 2 of 3

**CR3 Emergency Notification Scenarios**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY
6.	Site Area Emergency (Refer to Scenario 9 if activation of remote facilities is required.)	Site Area Emergency declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
7.	General Emergency (Refer to Scenario 10 if activation of remote facilities is required.)	General Emergency declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Technical Support Center</li> <li>• Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
8.	Alert (Remote Facilities)	Alert declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Remote Technical Support Center</li> <li>• Remote Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>
9.	Site Area Emergency (Remote Facilities)	Site Area Emergency declared. Activate the following facilities: <ul style="list-style-type: none"> <li>• Remote Technical Support Center</li> <li>• Remote Operational Support Center</li> <li>• Emergency Operations Facility</li> <li>• Emergency News Center</li> </ul>

## ATTACHMENT 2

Sheet 3 of 3

**CR3 Emergency Notification Scenarios**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY
10.	General Emergency (Remote Facilities)	General Emergency declared. Activate the following facilities: <ul style="list-style-type: none"><li>• Remote Technical Support Center</li><li>• Remote Operational Support Center</li><li>• Emergency Operations Facility</li><li>• Emergency News Center</li></ul>
11.	Fire Brigade Support to SAB	Event requiring off-shift Fire Brigade support to report to the Site Admin Building. (Example: Large-area fire)
12.	Fire Brigade Support to EOF	Event requiring off-shift Fire Brigade support to report to the Emergency Operations Facility. (Example: Large-area fire)
13.	Event Termination	Plant conditions no longer require ERO to stand by or to report as determined by Emergency Coordinator or EOF Director.

**HNP Emergency Notification Scenarios****NON-SECURITY EVENTS**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
<b>20</b>	<b>UNUSUAL EVENT – Notification Only</b>	<b>EMERGENCY / ALL CALL</b>	<b>Unusual Event</b>
<b>21</b>	<b>UNUSUAL EVENT – Pre Staffing Facilities</b>	<b>EMERGENCY / ALL CALL</b>	<b>Unusual Event</b>
<b>22</b>	<b>ALERT</b>	<b>EMERGENCY / ALL CALL</b>	<b>Alert</b>
<b>23</b>	<b>SITE AREA EMERGENCY</b>	<b>EMERGENCY / ALL CALL</b>	<b>Site Area Emergency</b>
<b>24</b>	<b>GENERAL EMERGENCY</b>	<b>EMERGENCY / ALL CALL</b>	<b>General Emergency</b>
<b>25</b>	<b>EVENT TERMINATION</b>	<b>Event Termination / All Call</b>	<b>Any Event</b>

**HNP Emergency Notification Scenarios****SECURITY EVENTS**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
<b>30</b>	<b>SEC UNUSUAL EVENT – Notification Only</b>	<b>Security Emergency / All Call</b>	<b>Unusual Event</b>
<b>31</b>	<b>SEC UNUSUAL EVENT – Pre Staffing Facilities</b>	<b>Security Emergency / All Call</b>	<b>Unusual Event</b>
<b>32</b>	<b>SEC ALERT</b>	<b>Security Emergency / All Call</b>	<b>Alert</b>
<b>33</b>	<b>SEC SITE AREA EMERGENCY</b>	<b>Security Emergency / All Call</b>	<b>Site Area Emergency</b>
<b>34</b>	<b>SEC GENERAL EMERGENCY</b>	<b>Security Emergency / All Call</b>	<b>General Emergency</b>
<b>35</b>	<b>SEC EVENT TERMINATION</b>	<b>Security Event Termination / All Call</b>	<b>Any Event</b>



ATTACHMENT 3

Sheet 3 of 5

**HNP Emergency Notification Scenarios**

**Drill – Non Security Events**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
40	Drill - UNUSUAL EVENT – Notification Only	Drill / All Call	Unusual Event
41	Drill - UNUSUAL EVENT – Pre Staffing Facilities	Drill / All Call	Unusual Event
42	Drill - ALERT	Drill / All Call	Alert
43	Drill – SITE AREA EMERGENCY	Drill / All Call	Site Area Emergency
44	Drill – GENERAL EMERGENCY	Drill / All Call	General Emergency
45	Drill - EVENT TERMINATION	Drill Event Termination / All Call	Any Event

# ATTACHMENT 3

Sheet 4 of 5

## HNP Emergency Notification Scenarios

### Drill – Security Events

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
50	SEC Drill – UE - Notification Only	Drill Security Emergency / All Call	Unusual Event
51	SEC Drill – UE – Pre Staffing Facilities	Drill Security Emergency / All Call	Unusual Event
52	SEC Drill - ALERT	Drill Security Emergency / All Call	Alert
53	SEC Drill – SITE AREA EMERGENCY	Drill Security Emergency / All Call	Site Area Emergency
54	SEC Drill – GENERAL EMERGENCY	Drill Security Emergency / All Call	General Emergency
55	SEC Drill - EVENT TERMINATION	Drill Security Emergency / All Call	Any Event

ATTACHMENT 3

Sheet 5 of 5

**HNP Emergency Notification Scenarios**

**Administrative and Testing**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
60	Testing of EverBridge Notification System	System Testing / Selective Individuals	Testing
61	Emergency Response Facility Staffing	Response Staffing / All Call	ERF Staffing
62	Security EverBridge Training Exercise	System Testing / Selective Individuals	Testing

**RNP Emergency Notification Scenarios****EMERGENCY CONDITIONS**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
<b>1</b>	<b>UNUSUAL EVENT – ACTIVATION * (ALL CALL)</b>	<b>EMERGENCY / ALL CALL</b>	<b>Unusual Event</b>
<b>2</b>	<b>UNUSUAL EVENT – NO ACTIVATION * (ALL CALL)</b>	<b>EMERGENCY / ALL CALL</b>	<b>Unusual Event</b>
<b>3</b>	<b>UNUSUAL EVENT – ACTIVATION - R E R F * (ALL CALL)</b>	<b>EMERGENCY / ALL CALL</b>	<b>Unusual Event</b>
<b>4</b>	<b>UNUSUAL EVENT – ACTIVATION</b>	<b>EMERGENCY / PAGER ONLY</b>	<b>Unusual Event</b>
<b>5</b>	<b>UNUSUAL EVENT – NO ACTIVATION</b>	<b>EMERGENCY / PAGER ONLY</b>	<b>Unusual Event</b>
<b>6</b>	<b>UNUSUAL EVENT – ACTIVATION - R E R F</b>	<b>EMERGENCY / PAGER ONLY</b>	<b>Unusual Event</b>
<b>7</b>	<b>ALERT – ACTIVATION * (ALL CALL)</b>	<b>EMERGENCY / ALL CALL</b>	<b>Alert</b>
<b>8</b>	<b>ALERT – ACTIVATION – R E R F * (ALL CALL)</b>	<b>EMERGENCY / ALL CALL</b>	<b>Alert</b>

ATTACHMENT 4  
Sheet 2 of 6  
**RNP Emergency Notification Scenarios**  
**EMERGENCY CONDITIONS**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
9	ALERT – ACTIVATION	EMERGENCY / PAGER ONLY	Alert
10	ALERT – ACTIVATION - R E R F	EMERGENCY / PAGER ONLY	Alert
11	SITE AREA EMERGENCY – ACTIVATION * (ALL CALL)	EMERGENCY / ALL CALL	Site Area Emergency
12	SITE AREA EMERGENCY – ACTIVATION - R E R F * (ALL CALL)	EMERGENCY / ALL CALL	Site Area Emergency
13	SITE AREA EMERGENCY – ACTIVATION	EMERGENCY / PAGER ONLY	Site Area Emergency
14	SITE AREA EMERGENCY – ACTIVATION – R E R F	EMERGENCY / PAGER ONLY	Site Area Emergency
15	GENERAL EMERGENCY – ACTIVATION * (ALL CALL)	EMERGENCY / ALL CALL	General Emergency
16	GENERAL EMERGENCY – ACTIVATION – R E R F * (ALL CALL)	EMERGENCY / ALL CALL	General Emergency
17	GENERAL EMERGENCY – ACTIVATION	EMERGENCY / PAGER ONLY	General Emergency
18	GENERAL EMERGENCY – ACTIVATION – R E R F	EMERGENCY / PAGER ONLY	General Emergency

**RNP Emergency Notification Scenarios****EMERGENCY CONDITIONS**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
<b>19</b>	<b>PAGER FAILURE * (ALL CALL)</b>	<b>EMERGENCY / ALL CALL</b>	<b>Pager Failure</b>
<b>20</b>	<b>PAGERS RETURNED TO SERVICE * (ALL CALL)</b>	<b>EMERGENCY / ALL CALL</b>	<b>Pagers Returned To Service</b>
<b>21</b>	<b>FIRE BRIGADE – REPORT TO STATION 8</b>	<b>EMERGENCY / SELECTIVE CALL</b>	<b>Fire Brigade</b>
<b>22</b>	<b>FIRE BRIGADE – REPORT TO R N P</b>	<b>EMERGENCY / SELECTIVE CALL</b>	<b>Fire Brigade</b>
<b>23</b>	<b>TERMINATION OF EVENT</b>	<b>EMERGENCY / PAGER ONLY</b>	<b>Termination Of Event</b>

## RNP Emergency Notification Scenario

### Drill Conditions

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
24	Drill – UNUSUAL EVENT – ACTIVATION * (ALL CALL)	Drill / All Call	Unusual Event
25	DRILL - UNUSUAL EVENT – NO ACTIVATION * (ALL CALL)	Drill / All Call	Unusual Event
26	DRILL – UNUSUAL EVENT – ACTIVATION - R E R F * (ALL CALL)	Drill / All Call	Unusual Event
27	DRILL - UNUSUAL EVENT - ACTIVATION	Drill / Pager Only	Unusual Event
28	DRILL – UNUSUAL EVENT - NO ACTIVATION	Drill / Pager Only	Unusual Event
29	DRILL – UNUSUAL EVENT - ACTIVATION - R E R F	Drill / Pager Only	Unusual Event
30	DRILL - ALERT – ACTIVATION * (ALL CALL)	Drill / All Call	Alert
31	DRILL - ALERT - ACTIVATION - R E R F * (ALL CALL)	Drill / All Call	Alert

**RNP Emergency Notification Scenario****Drill Conditions**

<b>SCENARIO NO.</b>	<b>SCENARIO TITLE</b>	<b>APPLICABILITY</b>	<b>EXAMPLE</b>
32	DRILL - ALERT - ACTIVATION	Drill / Pager Only	Alert
33	DRILL - ALERT – ACTIVATION - R E R F	Drill / Pager Only	Alert
34	DRILL – SITE AREA EMERGENCY – ACTIVATION * (ALL CALL)	Drill / All Call	Site Area Emergency
35	DRILL – SITE AREA EMERGENCY – ACTIVATION – R E R F * (ALL CALL)	Drill / All Call	Site Area Emergency
36	DRILL – SITE AREA EMERGENCY - ACTIVATION	Drill / Pager Only	Site Area Emergency
37	DRILL – SITE AREA EMERGENCY – ACTIVATION – R E R F	Drill / Pager Only	Site Area Emergency
38	DRILL – GENERAL EMERGENCY – ACTIVATION * (ALL CALL)	Drill / All Call	General Emergency
39	DRILL – GENERAL EMERGENCY – ACTIVATION – R E R F * (ALL CALL)	Drill / All Call	General Emergency
40	DRILL – GENERAL EMERGENCY - ACTIVATION	Drill / Pager Only	General Emergency



ATTACHMENT 4  
Sheet 6 of 6  
**RNP Emergency Notification Scenario**

**Drill Conditions**

SCENARIO NO.	SCENARIO TITLE	APPLICABILITY	EXAMPLE
41	DRILL – GENERAL EMERGENCY - ACTIVATION – R E R F	Drill / Pager Only	General Emergency
42	DRILL – AUGMENTATION * (ALL CALL)	Drill / All Call	Augmentation Drill
43	DRILL – QUARTERLY COMMUNICATION * (ALL CALL)	Drill / All Call	Quarterly Test
44	DRILL – ERO TRAINING (EP USE ONLY) * (ALL CALL)	Drill / All Call	ERO Training
45	DRILL – CONTROL ROOM PRACTICE * (ALL CALL)	Drill / All Call	CR Practice
46	DRILL – SIMULATOR PRACTICE * (ALL CALL)	Drill / All Call	Simulator Practice
47	DRILL – TERMINATION	Drill / Pager Only	Termination Of Drill
48	E P - THREAT LEVEL INCREASE – ORANGE	Notice to Emergency Preparedness / Pager Only	National Terror Threat Level Increase
49	E P - THREAT LEVEL INCREASE – RED	Notice to Emergency Preparedness / Pager Only	National Terror Threat Level Increase

- 1) The Remote Emergency Response Facility (RERF) should be activated for the following events:
  - a) A security condition has made the site inaccessible.
  - b) The EOF/TSC facilities are NOT habitable due to flooding, fire, loss of power, etc.
  - c) If an extended evacuation is made as part of the initial Protective Action Recommendation (PAR).
  - d) As directed by the SEC or ERM.
- 2) (\*) Denotes (ALL CALL) in EverBridge Scenario Titles located in EverBridge database.

## ATTACHMENT 5

Sheet 1 of 1

### Using a LAN Computer to Activate the ERO

**NOTE:** This method is used to activate the ERO using the EverBridge website and any available LAN computer.

- 1) **LOG** onto the Emergency Response Organization Notification System, EverBridge using one of the following options:
  - Go to the internet and type "www.everbridge.net".
  - **IF** using a Windows XP Desktop, **THEN SELECT** Start>Programs>Emergency Preparedness >EverBridge.
  - **IF** using a Windows 7 Desktop, **THEN SELECT** Start>All Programs>DAE>Shortcuts Tab>Search EverBridge>Select EverBridge and Run Application.
- 2) **TYPE** the site identification from the list below (NOT case sensitive) in the "Member ID" field of the initial login screen.
  - a. For BNP, **TYPE** in "BNPactivation"
  - b. For CR3, **TYPE** in "CR3activation"
  - c. For HNP, **TYPE** in "HNPactivation"
  - d. For RNP, **TYPE** in "RNPactivation"
- 3) **ENTER** site specific Password from the "Password Card."
- 4) **SELECT** "GO" **OR PRESS** "Enter" on the keyboard.
- 5) **SELECT** "Scenario Manager" from left side of the screen.
- 6) **SELECT** "Send Scenario" under "Scenario Manager."
- 7) **LOCATE AND CONFIRM** the "Scenario Number" and "Scenario Title" provided by the SEC on the "Send Scenarios" screen, use the "Previous" and "Next" cursors to scroll through the scenario list as needed.
- 8) **CLICK** the desired "Scenario Title" in EverBridge once you have located and confirmed that the "Scenario Number" and "Scenario Title" provided by the SEC are in alignment.

**NOTE:** A satellite dish animation will appear on the screen to indicate transmission of the message.

- 9) **SELECT** "Send Message" at bottom of the "list unscheduled messages" screen.

ATTACHMENT 6  
Sheet 1 of 1

**Using the EverBridge Interactive Voice Response to Activate the ERO**

**NOTE:** The following steps can be used to activate EverBridge mass communications system via telephone. The automated system will require the following information to activate and ask for responses to the following queries.

- 1) **DIAL** EverBridge at 9-1-888-440-4911.
- 2) **LISTEN** to the IVR command **AND FOLLOW** the instructions:
  - a) *"Please enter your Member ID followed by the '#' sign."*
    - i) For BNP, **ENTER** "132508351" "#"
    - ii) For CR3, **ENTER** "132528221" "#"
    - iii) For HNP, **ENTER** "132508331" "#"
    - iv) For RNP, **ENTER** "132508341" "#"
  - b) *"Please enter your Password followed by the '#' sign."*
    - i) **ENTER** site specific password. See Password Card for site password.

**CAUTION**

Upon completion of the following steps, activation of the ERO will occur.

- 3) To launch a broadcast scenario now, **PRESS** the number "3".
- 4) To select your scenario by number, **PRESS** the number "1".
- 5) *"Please enter your scenario number followed by the '#' sign."*
  - a) For example; **"10" "#"**.
- 6) Voice will state title of the scenario. **VERIFY** this is the correct entry.
- 7) To select this scenario, **PRESS** "#" key, otherwise press "\*\*".
- 8) *"To launch this scenario now, PRESS the number '1'."*
- 9) **END** call

ATTACHMENT 7

Sheet 1 of 1

Using the Live EverBridge Operator to Activate the ERO

**NOTE:** The following steps can be used to activate the EverBridge mass communications system via telephone and the Live EverBridge Operator.

- 1.) **CALL** the live EverBridge operator at 9-1-877-220-4911. You will hear, *"Thank you, an EverBridge Operator will be with you momentarily."*

**NOTE:** The EverBridge Operator may use variations of the questions below.

- 2.) **QUESTION:** The agent will ask for your **Organization Name:**  
**ANSWER:** **SEE PASSWORD INFORMATION**
- 3.) **QUESTION:** The agent will ask for your **Member ID:**  
**ANSWER:** **SEE PASSWORD INFORMATION**
- 4.) **QUESTION:** For authentication purposes, the agent will ask you your **Hint Question:** *"What is your city of birth?"*  
**ANSWER:** **SEE PASSWORD INFORMATION**
- 5.) **QUESTION:** The agent should then ask, *"How may I help you?"*

**NOTE:** Ensure that the scenario number provided by the SEC and scenario name listed in EMG-NGGC-0005 are in alignment.

- ANSWER:** **"I WOULD LIKE TO SEND AN EMERGENCY SCENARIO USING THE FOLLOWING SCENARIO NUMBER:"** Provide the Live EverBridge Operator with the scenario number that has been provided to you by the SEC.
- 6.) **QUESTION:** The Live EverBridge Operator will then **CONFIRM** the Scenario Number (and Scenario Name) provided, *"Is this the correct Scenario Number?"*  
**ANSWER:** If the Scenario Number and Name are correct – **"YES."**  
If the scenario number and name are incorrect – **"NO."**  
Provide the Live EverBridge Operator with the correct scenario number that has been provided to you by the SEC before proceeding.
- 7.) **QUESTION:** The Live EverBridge Operator will then confirm, *"Would you like to send the notification now?"*  
**ANSWER:** **"SEND NOTIFICATION NOW."** The Live EverBridge Operator will then provide you with the Message Broadcast ID number for tracking purposes.

**REVISION SUMMARY**  
**EMG-NGGC-0005 Rev. 3**

<b>SECTION</b>	<b>REVISION COMMENTS</b>
Attachment 5 step 1).	Removed program location description for WIN7 implementation. <b>(Editorial)</b>

**EMG-NGGC-0005 Rev. 4**  
**PRR 615736, CR 619320**

<b>SECTION</b>	<b>REVISION COMMENTS</b>
Attachment 5 step 1).	Added removed EverBridge program instructions from previous revision and added location description for Windows 7 Desktop for WIN7 implementation. <b>(Editorial)</b>