Progress Energy

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-71 and DPR-62
Docket Nos. 50-325 and 50-324
Response to Request for Additional Information Regarding Proposed Exemption from Certain Requirements of the Fitness for Duty Rule for Managing Fatigue (NRC TAC Numbers ME5188 and ME5189)

Reference: Letter from Phyllis N. Mentel to U.S. Nuclear Regulatory Commission, *Request for Exemption from Certain Requirements of the Fitness for Duty Rule for Managing Fatigue*, dated December 16, 2010, ADAMS Accession Number ML103630405

Ladies and Gentlemen:

By letter dated December 16, 2010, Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., requested an exemption from certain requirements of the Fitness for Duty Rule for Managing Fatigue for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2.

On February 17, 2011, via electronic mail, the NRC provided a request for additional information (RAI) regarding the December 16, 2010, request. Responses to the RAI are provided in Enclosure 1.

No regulatory commitments are contained in this letter. Please refer any questions regarding this submittal to Mr. Lee Grzeck, Acting Supervisor - Licensing/Regulatory Programs, at (910) 457-2487.

Sincerely,

Phyllis N. Mentel

Phyllis N. Mentel
Manager - Support Services
Brunswick Steam Electric Plant

Progress Energy Carolinas, Inc.
Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461

A021
NRR

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Enclosures:
1. Response to Request for Additional Information
2. Procedure 0AI-68, "Brunswick Nuclear Plant Response to Severe Weather Warnings"
3. Procedure 0AOP-13.0, "Operation During Hurricane, Flood Conditions, Tornado, or Earthquake"

cc (with enclosures):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Victor M. McCree, Regional Administrator
245 Peachtree Center Ave, NE, Suite 1200
Atlanta, GA 30303-1257

U. S. Nuclear Regulatory Commission
ATTN: Mr. Philip B. O'Bryan, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission **(Electronic Copy Only)**
ATTN: Mrs. Farideh E. Saba (Mail Stop OWFN 8G9A)
11555 Rockville Pike
Rockville, MD 20852-2738

Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Mr. W. Lee Cox, III, Section Chief
Radiation Protection Section
North Carolina Department of Environment and Natural Resources
1645 Mail Service Center
Raleigh, NC 27699-1645

Response to Request for Additional Information

By letter dated December 16, 2010, Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., requested an exemption from certain requirements of the Fitness for Duty Rule for Managing Fatigue for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. On February 17, 2011, via electronic mail, the NRC provided a request for additional information (RAI) regarding the December 16, 2010, request. Responses to the RAI are provided below.

NRC Question 1

NRC staff is not only concerned with fatigue management prior to and during the requested exemption, staff is equally concerned with site individuals' fatigue when returning to work hour controls such that the resumption of work hour controls is prudently implemented and individuals are not fatigued on the first day on work hour controls. Please indicate what general criteria the Senior Plant Management will consider when making the determination to resume work hour controls.

CP&L Response

As discussed in the December 16, 2010, submittal, the proposed exit condition for the exemption request is:

> EXIT CONDITION: This is the time when BSEP personnel must fully comply with the requirements of 10 CFR 26.205(c) and (d) following severe weather involving tropical storm or hurricane force winds. This date and time will be determined by senior plant management and will be when sufficient personnel are available to meet the requirements of 10 CFR 26.205(c) and (d).

After the storm has passed, it is difficult to predict when relief personnel could return to the site based on the degree of surrounding infrastructure damage caused by the storm and the different locations that personnel chose for evacuation to avoid the storm. Typically, access to the area following storm damage is controlled by local government officials. Senior plant management will reestablish work hour controls as soon as practical after the event has ended or the emergency declaration has been terminated. The following are examples of the criteria which will be considered when making the determination to resume work hour controls.

- Adequate personnel, both onsite and from relief crews, are available (e.g., return of employees to the area, safe access to the site, ability to implement the emergency plan, sufficient number of qualified personnel, etc.) and they have had sufficient time off to reset their work hour clock.
- Status of the station following the severe weather event (i.e., site damage, critical equipment challenges, or other key activities needed to put the station in a safe condition).
- Ability to safely implement normal work activities using work hour controls.

NRC Question 2

Lessons learned from NUREG-1474 include that as much as possible, site preparation for a hurricane should occur prior to the need to sequester individuals. What is the time period that is allocated for personnel to prepare the site for a storm, prior to the arrival of hurricane force winds on-site? Please be as precise as possible with respect to the number of days or hours prior to the arrival of severe winds.

CP&L Response

Attachment 7, "Tropical Conditions Action Matrix," of plant procedure 0AI-68, "Brunswick Nuclear Plant Response to Severe Weather Warnings," provides the general guidelines used to initiate preparations in anticipation of tropical storm or hurricane conditions at the BSEP site. This matrix provides a graduated response starting with the possibility of tropical conditions affecting the site with additional actions taken at the issuance of a Tropical Storm Watch (i.e., issued 48 hours prior to expected tropical storm conditions), at the issuance of a Tropical Storm Warning (i.e., 36 hours prior to expected tropical storm conditions), at the issuance of a Hurricane Watch (i.e., issued 48 hours prior to expected hurricane conditions), and at the issuance of a Hurricane Warning (i.e., issued 36 hours prior to expected hurricane conditions). This matrix references actions contained in procedure 0AI-68 and in plant procedure 0AOP-13.0, "Operation During Hurricane, Flood Conditions, Tornado, or Earthquake." Copies of these procedures are provided in Enclosures 2 and 3, respectively.

NRC Question 3

With respect to the applicability of the exemption request, please provide a breakdown of the various job duty groups and numbers of individuals in each group who will be sequestered.

CP&L Response

Attachment 5, "Recommended Staffing for Severe Weather Events," of 0AI-68 (i.e., Enclosure 2) provides the requested breakdown of the various job duty groups and numbers of individuals in each group who will be sequestered.

NRC Question 4

Many factors contribute to fatigue; one of these factors is inconsistent start times. In order to manage fatigue during the sequester, will shift start times be pre-planned and consistent? Please explain the rational for organizing current shift start times.

CP&L Response

The storm crew is activated upon the direction of the Director - Site Operations. The storm crew consists of enough individuals to man two 12-hour shifts of workers (i.e., including covered workers) to maintain the safe and secure operation of the facility. These crews are augmented by Emergency Response Organization (ERO) personnel based on the severity category of the storm.

0AI-68 provides for bunking facilities in the emergency facilities for the off-shift crew. Hence, it is expected that crews will be allowed a 12-hour break between successive work periods, thereby meeting the work hour limits of 10 CFR 26.205(d)(1). Although not directly stated in a procedure, it is expected that the storm crew schedule will be consistent with the existing normal 12-hour schedule worked by BSEP Operations (i.e., day shift from 6:30 a.m. to 6:30 p.m. and night shift from 6:30 p.m. to 6:30 a.m.).

NRC Question 5

Time at work is one of the major contributors to fatigue (another is lack of restorative rest). What are the expected typical shift durations for the various job duty groups that will be sequestered? Will any individuals be required to work shifts longer than 12 hours?

CP&L Response

The storm crew consists of enough individuals to man two 12-hour shifts of workers (i.e., including covered workers) to maintain the safe and secure operation of the facility. These crews are augmented by ERO personnel based on the severity category of the storm. No covered workers will be scheduled to work more than 12 hours.

NRC Question 6

Licensees are expected to provide an opportunity for restorative rest to mitigate the fatigue that is possible under a sequester for hurricane force winds. Please describe the methods to be used and the procedures governing housing and bunking of the sequestered individuals.

CP&L Response

Designated sleeping areas are posted in the Technical Support Center/Emergency Operations Facility Building, including the Simulator space. Sleeping areas will also be established in available areas of the building containing the Operational Support Center (i.e., Operations and Maintenance Building) and the Control Building (i.e., Control Room area). Bedding (e.g., cots, termarest pads, blankets, and pillows) is delivered to these areas as part of site hurricane preparation efforts. 0AI-68, Attachment 3, "Personal Emergency Supplies and Equipment," provides guidance regarding the amount of supplies to be delivered to these locations. Although the accommodations and potentially stressful circumstances may not be ideal for restorative rest, these actions are consistent with the practice of fatigue management when limited personnel are available during severe weather conditions.

Procedure 0AI-68
"Brunswick Nuclear Plant Response to Severe Weather Warnings"

PLANT OPERATING MANUAL

VOLUME I
BOOK 2

ADMINISTRATIVE INSTRUCTION

0AI-68

BRUNSWICK NUCLEAR PLANT RESPONSE TO SEVERE WEATHER WARNINGS

REVISION 37

TABLE OF CONTENTS

1.0 PURPOSE

This procedure provides guidance for preparation of the Brunswick Nuclear Plant in response to severe weather conditions prior to implementation of the Radiological Emergency Response Plan.

2.0 REFERENCES

2.1 0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake

2.2 0PEP-02.1, Initial Emergency Actions

2.3 0PEP-02.6, Severe Weather

2.4 Brunswick County Disaster Relief and Assistance Plan, Annex O, Hurricane Response Plan

2.5 Effect of Hurricane Andrew on the Turkey Point Nuclear Generating Station from August 20-30, 1992 (March 1993)

2.6 0PT-47.0, Inventory of Emergency Foodstuffs

2.7 NUMARC - 87-00, Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors

2.8 8S42-P-101, Station Blackout Coping Analysis Report

R9 2.9 SOER 02-1, Severe Weather (12/03/02)

2.10 EC 70502, Interim Repair to Reactor Building Overhead Crane Structure

2.11 0MMM-015, Operation And Inspection Of Cranes And Material Handling Equipment

2.12 0PM-ENG541, EOF/TSC Emergency Generator Monthly PM Covington Diesel Generator, Model 7123-7305; 0PM-ENG542, EOF/TSC Emergency Generator Annual PM Covington Diesel Generator, Model 7123-7305; 0PM-ENG543, EOF/TSC Emergency Generator Five Year PM Covington Diesel Generator, Model 7123-7305

2.13 0PEP-02.6.21, Emergency Communicator

2.14 1OP-51, Electrical System Operating Procedure

2.0 REFERENCES (Continued)

2.15 2OP-51, DC Electrical System Operating Procedure

2.16 0PEP-04.6, Radiological Emergency Kit Inventories

2.17 0PEP-02.7, Recovery

2.18 EPL-00, Emergency Phone List Brunswick

3.0 DEFINITIONS/ABBREVIATIONS

3.1 **Advisory** - Official information issued by tropical cyclone warning centers describing all tropical cyclone watches and warnings in effect along with details concerning tropical cyclone locations, intensity and movement, and precautions that should be taken. Advisories are also issued to describe: (a) tropical cyclones prior to issuance of watches and warnings and (b) subtropical cyclones.

3.2 **Bulletin** - Information released at three or six hour intervals whenever severe weather exists.

3.3 **Eye** - The roughly circular area of comparatively light winds that encompasses the center of a severe tropical cyclone. The eye is either completely or partially surrounded by the eyewall cloud.

3.4 **Hurricane** - Severe tropical storm with maximum sustained surface winds greater than 73 mph (using the U.S. 1 minute average) and a well defined low barometric pressure center, called the eye. Hurricanes are rated based on the intensity of the storm. Wind speed is the key parameter in determining strength of a hurricane.

Category	Sustained Wind Speed (mph)	Storm Surge (feet above normal)
1	74-95	4-5
2	96-110	6-8
3	111-130	9-12
4	131-155	13-18
5	> 155	> 18

3.5 **Hurricane Warning** - A warning that sustained winds 74 mph or higher associated with a hurricane are expected in a specified coastal area in 36 hours or less. A hurricane warning can remain in effect when dangerously high water or a combination of dangerously high water and exceptionally high waves continue, even though winds may be less than hurricane force

3.0 DEFINITIONS/ABBREVIATIONS

3.6 **Hurricane Watch** - An announcement for specific coastal areas from NOAA that hurricane conditions are possible within 48 hours.

3.7 **National Oceanic and Atmospheric Administration (NOAA)** - Federal agency which predicts environmental changes and conserves/manages coastal and marine resources (National Weather Service, National Ocean Service, and National Marine Fisheries Service are NOAA programs).

3.8 **Tornado** - A violently rotating column of air in contact with the ground, usually developing from severe thunderstorms or hurricanes.

3.9 **Tornado Warning** - This condition is declared at the time tornadoes have been sighted.

3.10 **Tornado Watch** - Meteorological conditions in the described area are favorable to the formation of tornadoes.

3.11 **Tropical Storm** - A tropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) ranges from 39 mph to 73 mph.

3.12 **Tropical Storm Warning** - A warning that sustained winds within the range of 39 to 73 mph associated with a tropical cyclone are expected in a specified coastal area within 36 hours or less.

4.0 RESPONSIBILITIES

4.1 The Director - Site Operations is responsible for notifying the Vice President - Brunswick Nuclear Plant of severe weather conditions which could have an adverse impact on the site. This procedure may be implemented in part or as a whole, depending on the severity of projected and/or actual storm conditions. The Director - Site Operations shall decide the degree of implementation.

4.2 The Plant General Manager is responsible for providing the Director - Site Operations periodic updates on the reported weather conditions and the status of site preparations.

4.3 Senior Management is responsible for ensuring that pay policies are clearly communicated to personnel whose work schedules are affected by severe weather.

4.0 RESPONSIBILITIES

4.4 The Operations Shift Manager is responsible for:

4.4.1 Notifying the Plant General Manager when information of severe weather conditions is reported for the site.

4.4.2 Implementation of 0AOP-13.0, "Operation During Hurricane, Tornado, or Flood Conditions", for actions not covered by this procedure.

4.4.3 Periodic review of the 0PEP-02.1 Emergency Action Levels to evaluate conditions for the potential declaration of an emergency and the use of 0PEP-02.6, Severe Weather.

4.5 All Unit Managers are responsible for:

4.5.1 Implementing Attachment 1, General Unit Guidelines for Storm Preparation, and Attachment 2, Detailed Unit Guidelines for Storm Preparation, as appropriate.

4.5.2 Reporting the status of preparations and providing completed checklists to the Supervisor - Emergency Preparedness.

4.5.3 Coordinating with the Supervisor - Emergency Preparedness to ensure Emergency Response Organization (ERO) staffing requirements are maintained when determining available personnel resources.

4.6 The Supervisor - Emergency Preparedness is responsible for coordinating with Unit Managers to ensure ERO staffing requirements are maintained when determining available personnel resources and providing periodic updates to plant management.

5.0 GENERAL INFORMATION

5.1 Preparations should be conducted well in advance of winds and rain to limit outside activities during severe weather.

5.2 Any object not secured can become a dangerous missile in extreme winds. All loose objects should be secured or moved to indoor storage areas.

5.3 Caution should be taken to prevent the depletion of food and water reserves while a large number of personnel are on site for storm preparations.

5.0 GENERAL INFORMATION

5.4 In-stock supplies of bedding and personal hygiene equipment are available for personnel who remain onsite for extended periods. Supplies can be obtained from Materials and Contract Services, using normal material checkout procedures.

5.5 Both Brunswick and New Hanover Counties have plans for the evacuation of persons in low lying coastal areas. Families of personnel who are to remain at the plant should be advised to seek shelter inland with friends or relatives or follow the instructions of county officials for reporting to shelters.

5.6 Identification and resolution of Turbine Building and Reactor Building leaks should be completed by the start of Hurricane Season or as far as possible in advance of a storm.

6.0 PROCEDURE

6.1 Readiness Review

6.1.1 Annually, Emergency Preparedness shall coordinate a review of severe weather readiness.

6.1.2 Major activities and milestones of the review should be tracked by NTM in Passport.

6.1.3 This review shall, at a minimum, include representatives from each of the units with responsibilities listed in Attachment 2, Detailed Unit Guidelines for Storm Preparation.

6.1.4 The review should include Lessons Learned, OE Reports, PRRs, and NCRs initiated from the previous year's severe weather response. Changes in structures, processes and programs affecting severe weather response should also be reviewed.

6.1 Readiness Review

6.1.5 The review should include affirmations from each unit listed in Attachment 2 of readiness for the upcoming storm season and other severe weather.

1. Affirmations should include review of relevant areas of responsibility in 0AI-68, walk downs of areas of specific responsibility, and assurance that all required equipment, resources, and supplies are functional and available for use. Any exceptions should be noted and appropriate steps taken to correct (NCR, Work Request, etc.).

2. Affirmations may be tracked by NTM in Passport or written affirmations.

6.1.6 Review should be complete by June 01 of each year.

6.2 Tornado

6.2.1 When the Control Room is notified that a tornado watch has been issued, the Operations Shift Manager will initiate implementation of the following actions:

1. Notify Unit Managers or Duty Managers to implement this procedure, as appropriate.

2. During normal working hours (while crews are available) and as time permits, begin preparations to secure site areas in accordance with Attachment 1, General Unit Guidelines for Storm Preparation, and Attachment 2, Detailed Unit Guidelines for Storm Preparation, as appropriate.

3. During back shift hours (while crews are not available) and as time permits, perform a site inspection within the Protected Area and switchyard, and notify Maintenance personnel to secure any area of potential missiles and tie down/secure cranes, as required by 0AOP-13.0.

6.2.2 When the Control Room is notified that a tornado warning has been issued, the Operations Shift Manager will initiate implementation of the following actions:

1. Instruct personnel out-of-doors to seek shelter.

2. If conditions warrant, contact Security to notify occupants of trailers located outside the Protected Area to evacuate to the EOF/TSC/Training Building.

6.3 Hurricane

6.3.1 When a hurricane watch is issued (48 hours before sustained wind speeds are projected to exceed 73 miles per hour at the site), the following actions should be performed by each affected section.

1. Unit Managers will assign a lead individual to ensure the actions of this procedure are met. The name of the individual shall be given to the Plant General Manager for tracking of storm actions and resolution of any problems.

2. Unit Managers will identify volunteers to staff the station during the hurricane and prepare a duty roster with an adequate relief shift in the event offsite personnel cannot reach the plant. Coordinate with the Supervisor - Emergency Preparedness to ensure Emergency Response Organization (ERO) staffing requirements are maintained when determining available personnel resources. These people should be exempted from hurricane preparations and allowed to secure their home.

NOTE:	Personnel leaving site should be briefed that storm paths and speeds are unpredictable and they should call in periodically on the Brunswick Employee Information Hotline for the latest information. Notification of changes can also be made by group page, individual phone calls, or other means

3. The assigned lead individual will:

   a. Complete a walkdown of responsible areas to identify resources and material needs, and determine potential dangers and preventive measures.

   b. Begin preparations to secure site areas, in accordance with the applicable section of Attachment 1, General Unit Guidelines for Storm Preparation. Preparations should include obtaining and prestaging equipment for personnel who remain onsite during the storm.

   c. Begin securing equipment that could become missile hazards, such as pallets, barrels, wood, dumpsters, trash cans, and gas bottles.

6.3 **Hurricane** (Continued)

d. Attempt to complete all actions described in Attachment 1, General Unit Guidelines for Storm Preparation, approximately 12 hours before sustained wind speed at the site is projected to exceed 73 miles per hour.

6.4 Restoration

Equipment and supplies staged or prepared for a severe weather threat should be restored to normal condition following severe weather threats, using 0PEP-02.6, Severe Weather, section 6.4 and Attachment 3.

6.5 Post Event Critique

Following either a tornado or hurricane, a post event critique should be conducted to ensure that lessons learned are captured and entered into the lessons learned data base or the corrective action program, as appropriate. Management may waive this requirement, as plant conditions dictate.

7.0 RECORDS

Documentation generated from implementation of this procedure should be forwarded to the Supervisor - Emergency Preparedness for submittal to Document Services for retention.

General Unit Guidelines for Storm Preparation

1.0 Preparations Checklist

This section is the responsibility of the entire site with Emergency Preparedness ensuring actions are completed.

Actions	Initial
Ensure that Senior Management has clearly communicated pay policies to personnel whose work schedules are affected by severe weather.	
Move high value portable equipment to an elevated area away from windows and cover with plastic. Follow instructions from Information Technology regarding wrapping and moving computers and printers.	
IMove important records and documents to an elevated area away from windows.	
Ensure doors to rooms with windows are closed.	
Move portable items inside of structures and secure appropriately.	
Stage and secure equipment and supplies needed for restoration efforts in a fashion so that they are accessible without moving other items.	
Secure unnecessary power to facilities and equipment to reduce the likelihood of fire.	
Tape/board windows, as required (for example, windows in stock areas); close blinds and ensure external doors are secured on all assigned buildings (see Attachment 2, Detailed Unit Guidelines for Storm Preparations, for a listing of all applicable responsible areas). If external doors are locked, ensure keys are available to personnel who will remain onsite.	
Coordinate with the Supervisor - Emergency Preparedness to utilize volunteers to man the station during the storm. These people should be allowed to secure their homes while other unit personnel address the responsibilities of this procedure.	
Ensure the Unit 1 Railroad Airlock is available for storage of equipment by Operations and Maintenance, as described in Attachment 4.	

General Unit Guidelines for Storm Preparation

1.0 Preparations Checklist

Actions	Initial
Ensure that only non-essential equipment is stored in the Unit 2 Railroad Airlock. Equipment needed for restoration efforts should not be stored in this area. If onsite, do not store the ISFSI Transfer Cask in the Unit 2 Railroad Airlock.	
Secure all non-essential work in outside areas and place all tools and equipment in a safe condition.	
Anticipate loss of power to Auxiliary buildings. Ensure equipment vital to continued plant operation or emergency response remains stable.	
Check material condition of TAC, O&M, and TTC building external doors to ensure doors are closing properly and not susceptible to wind damage.	
Ensure sufficient video cameras with blank recording media are available in the EOF/TSC.	

Completed By: _____ Date_____

Signature/Initials

Detailed Unit Guidelines for Storm Preparation

INFORMATION TECHNOLOGY

1.0 Areas of Responsibility

- Computer Support
- Telecommunications Building
- Met Tower Building and Area

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

Actions	Initial
Upon declaration of a hurricane watch, ensure that Wilmington Telecommunications has assigned a representative to be at the site to assist in preparations for severe weather with a working Progress Energy System UHF radio.	
Verify that the Telecommunications Building and the Microwave Building generators are operable with full tanks of propane.	
When notified by EP, verify that there are two (2) computers and a printer in Room 149 of EOF/TSC Building. If not, relocate two (2) laptops and a printer to Room 149 of TSC/EOF Building.	
Upon declaration of a hurricane watch, evaluate which local servers need to be backed up and perform the appropriate backups.	
Upon declaration of a hurricane warning, issue guidance to site regarding moving and wrapping computers (or unplugging at work station), data backup, and any plans for network shut down.	
Secure loose items at the Met Tower Building/area, as necessary.	

Completed By: _____ Date_____

Signature/Initials

Detailed Unit Guidelines for Storm Preparation

E&RC

1.0 Areas of Responsibility

- Chemical Hazards Building
- Clean Trash Area
- Container Van Storage Area (CVSA)
- Hazardous Waste Area/Buildings
- Low Level Radwaste Processing Facility
- Radwaste Loading Dock
- North Warehouse
- Stack Filter House
- Storm Drain Collection Basin/Building and Stabilization Pond
- Interim Low Level Radwaste Storage Facility (ILLRSF)
- Sodium Hypochlorite/Acti-Brom Tank Skid

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

Actions	Initial
Move low level radioactive waste containers, i.e., drums and dumpsters staged outside to inside locations (Unit 2 Railroad Airlock, breezeway, Reactor Buildings, Low Level Warehouse, North Warehouse, Clean Trash Area).	
Ensure that all radioactive material containers that cannot be feasibly stored inside due to size and weight are properly secured, i.e., sea-land container doors are closed and latched; full radioactive waste liners and high integrity containers are placed in concrete shields with shield lids installed.	
Safely store and clearly identify all radioactive source storage locations. Provide a record of these locations with this checklist.	
If the OSC is being relocated, transfer portable radios and chargers from the OSC to the alternate location.	

E&RC

3.0 Preparations Checklist

Actions	Initial
Confirm that liquid sampling ports on storage vaults located in the Interim \Low Level Radwaste Storage Facility (ILLRSF) and Radwaste Loading Dock areas have been plugged.	
Radwaste Loading Dock	
Place FILLED Liners in culverts (storage area).	
Move EMPTY Liners into suitable storage areas (Unit 2 Railroad Airlock or North Warehouse).	
Stack Filter House	
Secure all doors, gas bottles, video monitor/housing, and ladders.	
Low Level Radwaste Processing Facility	
Tie Sea-Land Vans together using chain or cable, as appropriate.	
Storm Drain Collection Basin and Stabilization Pond	
Ensure that Totes are secured appropriately.	
Ensure the Storm Drain Collector Basin has been sampled by Chemistry	
North Warehouse (Radioactive Materials Container Storage Building)	
Ensure empty or lightweight drums stored in this building are adequately secured (for example, tied together).	
Move materials at the North end of Breezeway into the Breezeway or into the North Warehouse, if required.	
Chemical Hazards Building	
Ensure all chemicals are moved inside building.	
Container Van Storage Area	
Tie container vans together using chain or cable, as appropriate.	

Completed By: _____ Date_____

Signature/Initials

Detailed Unit Guidelines for Storm Preparation

EMERGENCY PREPAREDNESS

1.0 Areas of Responsibility

- Food Services
- EOF
- TSC
- OSC

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

	Actions	Initial
R 9	Establish a point of contact and post-storm staging area for employees not staying onsite during the storm, and ensure all personnel are informed.	
	Ensure EP Supervisor, or designee, keeps the operating shift informed of the status of hurricane preparations and resources available.	
	Coordinate with Unit Managers to ensure Emergency Response Organization (ERO) staffing requirements are maintained when determining available personnel resources. Use Attachment 5, Recommended Staffing for Severe Weather Events, as guidance for assigning personnel to emergency facilities and the plant (during the storm) and predesignating personnel for post-storm restoration efforts.	
R 9	Verify an inventory of all Emergency Response Facilities, and verify all emergency communications and notifications equipment is functional.	
	Verify backup antenna is on site and available for radios.	
	Verify an adequate supply of fuel is on site for the EOF/TSC emergency diesel. Ensure tanks are topped off, as necessary, and stage the fuel truck in appropriate area.	
	Coordinate arrival of NRC personnel who will be dispatched to the site for the storm.	
R 9	Notify food vending service to increase the food and beverage supplies in the break areas and overstock the O&M and TAC building cafeterias. Stock refrigerators in the EOF/TSC with food and drinks; coordinate distribution of food to Control Room, Service Water Building and Diesel Generator Building, as needed; and arrange for additional paper plates, cups, and utensils. Note: Rely on non-perishable foods as much as possible.	

EMERGENCY PREPAREDNESS

3.0 Preparations Checklist

Actions	Initial
Notify Materials and Contract Services to transfer baskets containing emergency supplies and equipment, as described in Attachment 3, Personal Emergency Supplies and Equipment, to Control Room, TSC, OSC and EOF.	
Notify Information Technology to stage two (2) laptop computers and a printer in the alternate OSC (Room 149 of EOF/TSC Building).	
Designate and post sleeping (bunk) areas in the TSC/EOF Building, including the Simulator space; also designate a breakout/conference area in the building.	
Coordinate with site departments to relocate Progress Energy vehicles to the parking lot between the TAC Building and TTC for use during post-storm restoration activities.	
Determine required amount of water and MREs to bring to the EOF/TSC and notify stores as soon as possible to expedite delivery.	

Completed By: _____ Date_____

Signature/Initials

MAINTENANCE

TECHNICAL SERVICES/MECHANICAL /I&C-ELECTRICAL

1.0 Areas of Responsibility

- Auxiliary Boiler Building and surrounding areas
- Clean Maintenance and surrounding areas
- Flat Cars
- Grounds and Roads inside and outside Protected Area
- Hot Maintenance Shop and surrounding areas
- Intake Structure Area and Crane
- Mobile Cranes
- Reactor Building and surrounding areas
- Refuel Floor for both Units
- Service Water Building and surrounding areas
- EOF/TSC Building and surrounding areas
- Turbine Building and surrounding areas
- Radwaste Process Area Building
- Radwaste Building Roof
- BECON Building
- Caswell Beach Pumping Station
- Iron Fabrication Shop
- Laydown Yard (inside and outside Protected Area)
- Paint Storage Building (outside Protected Area)
- Temporary Power
- Warehouse C
- Diesel Maintenance Shop
- Diversion Structure
- MOV Shop
- Paint Shack
- Bio-Lab
- Clean Trash Area
- Trailers
- Vehicle Maintenance Area
- Oil Boom Shacks and associated equipment
- ISFSI Storage Building
- Reactor Recirc VFD Building's (PDC)

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1
I&C/Electrical	8
Mechanics	8
Volunteers (certified in heavy equipment operations)	2

MAINTENANCE

TECHNICAL SERVICES/MECHANICAL /I&C-ELECTRICAL

Resource	Number
Rope, Spool 1/2", 3/8",5/8", 3/4"	10
Bags of Sand	700
Mop heads	500
Fine Mesh Net (Refuel Floor, 117' tool racks)	3/unit
Gallons of Gasoline	50
50' Drop Cords	20
Drop Lights	15
Electric Sump Pumps	3
Air Operated Sump Pumps	4
Portable Sump Pump (Gasoline or Diesel)	3
Portable Generators (Gasoline)	4
Portable toilets for remote areas (DG Building, Unit 2 Turbine Building Laydown, Unit 1 Railroad Airlock)	3

Refueling Activities

HPs per unit	2
Deconners per unit	1
Maintenance people per unit	6-8
Overhead crane operator per unit	1
Riggers/signal men per unit	2

MAINTENANCE TECHNICAL SERVICES

3.0 Preparations Checklist

Actions	Initial
Check status of sandbags located inside/outside the Protected Area and obtain additional sandbags, if necessary.	
Arrange and stockpile sandbags near susceptible areas. Refer to 0PEP-02.6, Severe Weather, for details on sandbag dikes. At a minimum, sandbags should be staged in the following areas:	

Location	Minimum # of Sandbags
TSC/EOF Training Bldg	60
1 TB 20' West Entrance	16
2 TB 20' West Entrance	16
1 TB 20' 4160 BOP Switchgear	40
2 TB 20' 4160 BOP Switchgear	40
DG Bldg Loading Dock Roll-up Door (south end, inside of door only)	60
Radwaste Bldg Doors	15
1 TB 20' North Breezeway	100
2 TB 20' South Breezeway	100
Control Bldg HVAC Room (back doors)	10
1 TB 20' EHC Room	15
2 TB 20' EHC Room	15
Caswell Beach Switchgear Building Doors	60
Media Center (back lobby) North Door	30
Media Center (back lobby) South Door	30
TTC rollup doors	40
TAC Building (west side) Middle double doors	60
O&M Bldg South entrance doors	30

Secure totes, battery boxes, trash cans, smoke cans, and dumpsters, or move inside, as appropriate.	

MAINTENANCE TECHNICAL SERVICES

3.0 Preparations Checklist

Actions	Initial
Tie down temporary structures, such as trailers.	
Determine status of Service Water and Screenwash pumps. If pumps have been removed for maintenance, ensure Service Water and Screenwash pump bays are secured, as follows: a. For Screenwash pump removal: Install a steel plate (ASTM A36) 1/4" x 25" x 2'-1" over the pump bay opening; stack sandbags, in an interlocking pattern, uniformly on the plate. **NOTE**: Minimum total sandbag weight shall be 450 pounds. b. For Service Water Pump removal: Install a steel plate (ASTM A36) 3/8" x 32" x 2'-8" over the pump bay opening. Stack sandbags, in an interlocking pattern, uniformly on the plate. **NOTE**: Minimum total sandbag weight shall be 1400 pounds. **OR** c. Reinstall pump casing.	
Ensure Maintenance vehicle fuel tanks are full (i.e., trucks, mobile cranes, forklifts, boat at Bio-Lab).	

Laydown Yard

Secure loose items together in bundles or store in barrels.	

Bio-Lab

Secure items, as necessary.	

MAINTENANCE TECHNICAL SERVICES

3.0 Preparations Checklist

Actions

Clean Trash Area	**Initial**
Dispose of lighter items, if possible.	
Weight down/tie down lighter items with heavy items. Tie down barrels and pallets together.	

Trailers

If possible, move all trailers out of switchyard and west side of plant.	
Tie down those trailers which are not secured.	

Vehicle Maintenance Area

Move vehicles into buildings, as applicable.	
Stage the fuel truck in an appropriate location, as directed by Emergency Preparedness.	
Obtain and store portable toilets in facilities to be occupied during the storm and restoration activities (i.e., DG Building, Turbine Building Laydown, Unit 1 Railroad Airlock).	

Paint Storage Building (outside Protected Area)

Secure the building with cables over roof.	

Service Water Building

Stage mop heads at both doorway entrances.	

Turbine Building

Stage mop heads in the 4160 Breaker Area and stage tarps and flood control items on the 70' elevation.	
Stage bins of mop heads in the breezeways for use in the 4160V breaker area.	

MECHANICAL MAINTENANCE

3.0 Preparations Checklist

Actions	Initial
Secure crane hooks and tornado latches, as appropriate. Tie down all cranes and hoists within and outside buildings.	
Keep at least two volunteers, who are certified to operate heavy equipment, onsite during the storm.	
DURING A REFUELING OUTAGE, coordinate unique precautions with the individual responsible for the Refueling Floor activities (such as placing the vessel head atop an open RPV and installing netting across the refueling cavity and spent fuel pools).	
DURING A TURBINE OUTAGE, coordinate unique precautions with the individual responsible for the Turbine (such as reinstallation of the rotor and housing).	
Implement unit floor stabilization, ensuring that items on each floor of the power block are fastened or locked to prevent movement.	
Coordinate transfer/storage of equipment described in Attachment 4 to the Unit 1 Railroad Airlock for severe weather activities/restoration efforts.	
Remove drain socks from the heater bay roof area drains and 20' area drains, as necessary, to facilitate expected drainage.	

MECHANICAL MAINTENANCE

3.0 Preparations Checklist

Actions **Initial**

Refueling Floor

Notify Operations that both units will be secured and identify unit interfaces and phone numbers for activities.	
Ensure RWPs for both units (117' elevations) are available to support storm activities.	
For both units, secure all barrels and small items on 117' elevation to 98' rebuild room.	
Drape netting over open storage bins and other equipment to prevent equipment from being introduced into the fuel pool.	
Verify that the rigid pole assembly trolleys are locked down; and the seismic rail clamps on the Auxiliary Work Platform (AWP) are fully engaged.	
Tie off and connect hand rails around Spent Fuel Pool and hatchway.	
Ensure both overhead cranes are parked, as required by 0MMM-015, during a severe weather warning.	

Note: Following the severe weather event that required the refuel bridge to be placed at south end of spent fuel pool, ensure refuel bridge is positioned within 6 inches of the northeast stop (north of the red mark on the floor) when not in use.

Move refuel bridge south and secure to cavity plug with come-a-long.	
Request Operations to isolate power to the refuel platform, overhead crane and other sources, as necessary.	
Request Operations and I&C to lock out the elevators for both units after the floor is secured. The Refuel Floor Supervisor shall declare the floors secured.	

Note: Sump pumps are stored in the mini-storage unit and Warehouse B, as described in Attachment 3.

Diesel Generator Building

Prepare toolbox/repair kit and stage in area (for example, on load dock outside roll-up door).	
Stage air sump pump at south end of building.	

MECHANICAL MAINTENANCE

3.0 Preparations Checklist

Actions	Initial
Intake Structure	
Inspect the trash racks at the Intake and Diversion Structures for accumulation of trash/debris on the racks and clean, as necessary.	
Assess the need for lubricants and other items to maintain operability and obtain necessary items.	
Mobile Cranes	
Move to a safe location.	
Lower boom and secure in stowed position.	
Ensure all brakes are set and all outriggers are down.	
Lock or secure all doors.	
Reactor Building	
Check Railroad Track Seals at Rail Bay Doors.	
Assess the need for lubricants and other items to maintain operability; and obtain necessary items.	
Prepare toolbox/repair kit and stage in area (for example, HP office).	
Ensure portable generators and air compressors are stored in a safe location and are available for use (see Attachment 3, Personal Emergency Supplies and Equipment).	
Service Water Building	
Assess the need for lubricants and other items to maintain operability and obtain necessary items.	
Prepare toolbox/repair kit and stage in area (for example, on landing inside door).	
Stage air sump pump on 20' elevation (for example, at top of stairs).	

MECHANICAL MAINTENANCE

3.0 Preparations Checklist

Actions	Initial
EOF/TSC/Training Building	
Verify contents of toolbox/repair kit and lubricants in Room 165 near Emergency Diesel Generator.	
Verify the EOF/TSC Emergency Diesel Generator oil spill basin is drained of all collected rainwater. **NOTE:** E&RC Environmental controls the key to the drain valve and must approve prior to drainage.	
Move mobile crane (Grove) into position to block the alley way between EOF/TSC Building and missile shield wall.	
Lubricate doors in building prior to staffing facilities.	
Oil Boom Shacks	
Ensure the oil booms staged at the Intake Structure Staging Buildings are inspected and secured.	
Turbine Building	
Stage electric sump pumps in 4160 Breaker Area on 20' elevation (TB 1 & 2)	
Secure miscellaneous equipment and small items on 70' elevation (Tool Room Area and Heater Bay Roof), or relocate to lower elevation.	
Assess the need for lubricants and other items to maintain operability and obtain these items.	
Assess and obtain the following for the RCA Chemical Storage Locker: •2 Gallons DTE 732 •2 Gallons DTE H/M •2 Gallons DTE Extra-Heavy	
Prepare a toolbox utilizing existing tools in Hot Tool Room and stage in this area.	
Radwaste Process Area Building	
Install shield plugs. Secure building (tie down or lash).	
Caswell Beach Pumping Station	
Prepare tool box/repair kit and stage in area (for example, in the mechanic shop, roll around gang box).	
Stage electric sump pump inside the east double doors.	

MECHANICAL MAINTENANCE

3.0 Preparations Checklist

Actions	Initial
Clean Maintenance Shop	
Stage the following in the area: one (1) roll of plastic; one (1) gas generator; two (2) chainsaws; three (3) quarts of two-cycle oil; ten (10) droplights; twelve (12) 50' extension cords; two (2) spools of 1/2" lifeline rope; one (1) spool of 1/2" rope; and four (4) spools of 3/8" rope. Note: Stage gang box from mini storage unit in Clean Maintenance Shop.	
Mechanical Shop Area	
Cover equipment, as appropriate.	
Radwaste Building Roof	
Replace equipment access plugs removed for maintenance activities.	
Ensure Unit 1 & 2 CFD Cask Lifting Enclosure monorail doors are bolted closed. (Ref. drawing F-01625)	
Reactor Recirc VFD Buildings PDC in North Yard	
Secure all doors.	
Stage mop heads at all door-way entrances.	

Completed By: _____ Date_____

Signature/Initials

Detailed Unit Guidelines for Storm Preparation

I&C / ELECTRICAL

3.0 Preparations Checklist

Actions	Initial
Start and load test the EOF/TSC Diesel Generator, in accordance with the applicable sections of 0PM-ENG541, if not performed in the previous seven (7) days by procedures 0EPM-ENG541, 0EPM-ENG542, or 0EPM-ENG543.	
Reactor Building	
Secure radios and chargers, PA locations, phone extensions or sound powered phones.	
Prepare toolbox/repair kit and stage in area.	
Service Water Building	
Prepare toolbox/repair kit and stage in area.	
Turbine Building	
Stage Canvas/Tarp in the 4160 Breaker Area and stage tarps and flood control items on the 70' elevation.	
Prepare toolbox/repair kit and stage in area.	
Warehouse C	
Secure and cover equipment, as necessary.	
I&C Shop Area	
Check and cover equipment, as necessary.	
Diesel Generator Building	
Prepare toolbox/repair kit and stage in area.	

Completed By: _____ Date_____

Signature/Initials

MATERIALS AND CONTRACT SERVICES

1.0 Areas of Responsibility

1.1 Outside Protected Area:

- "F" Pad
- Receiving
- Warehouse A, B, H

1.2 Inside Protected Area:

- Cylinder Storage
- North Warehouse (Heavy Warehouse and Pole Warehouse)
- Stores, Issuing and Ordering
- Lube/Paint and Storage Building (Protected Area)

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Lube Shack Personnel (3 hrs)	1
Coordinator	1
Warehouse B personnel (5-6 hrs)	2
Warehouse H/A personnel (5-6 hrs)	2
"F" Pad personnel (5-6 hrs)	4
Receiving personnel (5-6 hrs)	4
Windows personnel (2-3 hrs)	4
Cylinder Storage personnel (3 hrs)	1
North Warehouse personnel (8 hrs)	4
Issue Counter personnel (8-10 hrs)	8
Forklifts	3
3/4" plywood (sheet)	16
3/8" drills w/bits	2
Duct tape (roll)	39
#16 Gage Tie Wire (roll)	1
Plastic (roll)	22
Green plastic (roll)	10
Extension ladders	2
3/8" or larger rope (roll)	3
Chain (box)	1
4000 watt (minimum) 110 VAC Generator	4

3.0 Preparations Checklist

Actions	Initial
Transport potable water containers to the EOF/TSC/OSC/Service Water Building/Radwaste Building for storage, as requested by Emergency Preparedness.	
Store equipment such as chain saws in safe accessible locations.	
Pre-stage baskets with emergency supplies in Warehouses B and H to locations, as requested. (See Attachment 3 for list of Emergency Supplies/Equipment.)	
Safely store and clearly identify all radioactive source storage locations; and provide a record of these locations to E&RC.	
Ensure generators run, are fueled, and ready to distribute.	
Secure pallets outside Warehouse H.	

"F" Pad

Break stacks into small stacks and secure all sheet metal and light weight plate steel.	
Secure and/or restage lumber and plywood.	
Secure "Christmas Tree" racks.	
Tie off empty drums stored outside buildings or C-vans.	

Receiving

Clear motor freight area for staging emergency equipment and supplies.	
Relocate trailers to Warehouse H.	
Ensure portable radio and chargers are available and charged.	
Ensure Vehicles are gassed and staged in Warehouse.	
Secure dumpsters in Receiving Area.	

Detailed Unit Guidelines for Storm Preparation

MATERIALS AND CONTRACT SERVICES

3.0 Preparations Checklist

Actions	Initial
Warehouse B	
Ensure center aisle is clear for staging emergency supplies and equipment.	
Fully charge electric forklift.	
Ensure gas powered forklifts are fueled and staged in Warehouse.	
Warehouse H	
Fully charge electric forklift.	
Ensure truck is gassed and staged in Warehouse.	
Ensure portable radio and chargers are available and charged.	
Issue Counter	
Tape windows at main issue counter and Areas 1 and 3, if required (not required if areas will not be occupied during severe weather).	
Cover and tape ceiling vents with plastic, if required (not required if areas will not be occupied during severe weather).	
Move stores trailer to Warehouse H.	
Place forklift inside Area 3 against roll-up door.	
Prepare aisle in Area 3 for emergency supplies.	
North Warehouse (Heavy Warehouse, Weld Machine Storage Area, and Pole Warehouse)	
Tie baskets together with rope.	
Tape drums on pallet together, then tie to pallet with rope.	
Secure gang boxes to pallet racks.	
Secure wooden crates to pallets or to pallet racks.	

3.0 Preparations Checklist

Actions **Initial**

Lube/Paint and Storage Building (Protected Area)

Tie each row of partially full drums to shelf where they are located with 1/2" rope.	
Remove filter from shelf, place on pallet, and cover with plastic.	
Put grease guns in cabinet, ensure doors are secure, and tie cabinet to building structural supports with at least 1/2" rope.	
Put small cans/drums of grease together and tape together.	
Check status of outside louvers and vents.	
Tie step ladder to bulk rack.	

Cylinder Storage

Put cylinders and bottle carts in concrete bays.	

Completed By: _____ Date_____

Signature/Initials

OPERATIONS

1.0 Areas of Responsibility

- AOG - Roof and CAD Area
- 0AOP-13.0
- Caswell Beach Pumping Station
- Chlorination Building
- Control Building
- Makeup Water Treatment Building
- Radwaste Building
- Switchyard
- Installed Generators and Air Compressors
- Hydrogen and Oxygen Bulk Storage Area
- Unit 2 Turbine Building Ventilation Sample Skid Enclosure

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

Actions	Initial
Implement 0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake.	
Verify locking tabs on the Control Room emergency food storage locker are intact and tab numbers match those recorded during the last performance of 0PT-47.0. If locking tabs are broken, or numbers do not match, perform 0PT-47.0, Inventory of Emergency Foodstuffs.	
Contact Radwaste to minimize radwaste liquid inventory (including auxiliary surge tank) to prepare for possible high inleakage due to flooding.	
Review the status of out-of-service equipment for maintenance or testing to identify those whose redundancy is desired during the storm and prioritize work to restore the equipment to an operable status.	
Attempt to conduct all surveillances which will come due during the storm prior to its arrival.	

OPERATIONS

3.0 Preparations Checklist

Actions	Initial
NOTE: The loss of the Progress Energy Southport Substation/Boiling Springs Feeder will result in power outages at the following locations: Hydrogen Water Chemistry skid; EOF/TSC, TAC, and O&M Buildings; Warehouses, ISFSI area and general office areas.	
On loss of Progress Energy Southport Substation/Boiling Springs Feeder Operators, should verify the following actions: 1) Contact I&C/Electrical and verify proper operation of the EOF/TSC diesel generator. 2) If power is lost to the Hydrogen Water Chemistry (HWC) skid, HWC should be removed from service to prevent an inadvertent trip and possible AOG bypass. 3) Loss of mainframe and LAN computer systems should be anticipated.	

Detailed Unit Guidelines for Storm Preparation

OPERATIONS

3.0 Preparations Checklist

Actions	Initial
Stage Fire Brigade personnel, medical, and first aid equipment in the EOF/TSC/Training Building and in the plant.	
Verify fire protection equipment storage areas are secured (cabinet and alarm panel doors are shut, hose reels and portable extinguishers are secured, and compensatory hoses are tied down).	
Coordinate transfer/storage of equipment described in Attachment 4 to the Unit 1 RR Airlock for severe weather activities/restoration efforts.	
Stage a portable generator at the EOF/TSC Training Building Area.	
Install life-lines between operating areas of the plant (i.e., Radwaste Loading Dock, Diesel Generator and Service Water Building; Diesel Generator Building and Diesel Generator Fuel Storage Area; and Turbine Building 70' entrance to Control Building HVAC entrance).	
Coordinate with Air Products personnel to secure Hydrogen and Oxygen Storage Area.	
Verify fire tanks are filled (fuel and water).	
Perform a review of Battery Ground Status, per 1OP-51 and 2OP-51, and resolve any problems, as necessary, to maintain required equipment operability.	
Initiate an action item to complete an audit of clearance tags in areas open to weather conditions following severe weather onsite.	
Ensure that the Unit 2 Turbine Building Ventilation System is in the Recirculation Mode, the Sample Pump Skid is secured, and the Unit 2 Turbine Building Ventilation Sample Skid enclosure building door is closed.	

Completed By: _____ Date_____

Signature/Initials

SECURITY

1.0 Areas of Responsibility

- Security Access Points
- Security Building

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

Actions	Initial
Verify contingencies are in place for losses of security systems.	
Verify contingencies are in place to suspend outdoor security functions when deemed necessary.	
Move necessary equipment to TSC when relocation is required.	
Conduct walkdowns for potential hazards at security post.	
Take down flags at ACP/TAC/Visitor's Center.	

Completed By: _____ Date_____

Signature/Initials

BRUNSWICK ENGINEERING SUPPORT

1.0 Areas of Responsibility

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

Actions	Initial
Conduct walkdowns by System Engineers to identify potential storm - related concerns including missile hazards and flood concerns, using Attachment 6, Recommended Minimum System Walkdowns for Severe Weather.	
Ensure that the Eastern Transmission Area has personnel available to report to the site when the decision is made to staff the EOF/TSC. This is coordinated through the Plant Transmission Activities Coordinator (PTAC) or Backup PTAC.	

Completed By: _____ Date_____

Signature/Initials

SITE COMMUNICATIONS

1.0 Areas of Responsibility

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

Actions	Initial
Coordinate development and transmittal of "Straight Talk" and/or other means of communication describing status of emergency/storm preparations to site personnel, etc. Include special instructions, for example: 1. Remind personnel required to stay on site during the storm to pack items, such as: • Changes of clothes • Toiletries (towel, shampoo, toothbrush, razor) • Pillow/ Cot • Raincoat • Boots • Alarm clock • Medicines • Special foods 2. Personnel reporting location and vehicle parking information. 3. Point of contact for family members. 4. Instructions for restoration team personnel concerning time to report to plant (i.e., after hurricane warning is lifted and roads are determined safe). 5. Non-essential personnel point of contact for returning to work. 6. Pay issues (model timesheet information).	
Coordinate with EP to ensure any information generated concerning the storm and information on BNP Employee Information Hotline is consistent.	
Communicate with Corporate Office (i.e., Communications, Finances, etc.) regarding storm preparation activities and storm status.	

Completed By: _____ Date_____

Signature/Initials

NUCLEAR OVERSIGHT SECTION (NOS)

1.0 Areas of Responsibility

- Administration Building
- Document Control Building
- Visitors Center and Media Center

2.0 Recommended Personnel and Equipment Resources

Resource	Number
Coordinator	1

3.0 Preparations Checklist

Actions	Initial
Move butt cans and trash cans inside buildings.	
Initiate transport of trash dumpster and recycle tip bins at Media Center to Clean Trash Area, or secure by tying down.	
Secure loose items, as necessary.	

Completed By: _____ Date_____

Signature/Initials

R9

Personal Emergency Supplies and Equipment

NOTE: Personal supplies for the Emergency Response Facilities (containing items A-D below) are labeled for each facility; stored in baskets in Warehouse H; and should be transferred, when directed by Emergency Preparedness:

- Control Room ~20 of each item.
- OSC: ~ 30 of each item
- TSC: ~ 40 of each item
- EOF: ~ 30 of each item

Personal hygiene kits (Item E) should be transferred separately to each location.

	Item Description	Quantity Available (Approx.)	PGN Part Number
A.	Blankets (shelter, polyester) (Warehouse H)	128	736-801-26
B.	Pillows (disposable) (Warehouse H)	200	736-801-00
C.	Pillow Cases (disposable) (Warehouse H)	274	736-801-34
D.	Bedding [cots, thermarest pads, in Warehouse]	162	736-801-42
E.	Kits (personal hygiene)	126	736-801-59
F.	Meals Ready to Eat (MRE's) (Stored in Warehouse H)	1400	
G.	Consumable - Bottled Water (5-gallon containers)	200	

R9

Personal Emergency Supplies and Equipment

H.	Generators	
	1. 4 - 4000 watts min. (in warehouse)	gas
	2. 3 - 4000 watts min. (in Mini-storage unit)	gas
I.	Compressors (minimum of 4 with at least the capacity as described below)	
	1. 160 cfm	gas
	2. 50 cfm	gas
	3. 250 cfm	diesel
	4. 80 cfm	gas
J.	Sump Pumps	
	1. Minimum of four (4) - 10 gpm (stored in Warehouse B)	gas
	2. Three (3) (stored in Mini-Storage Unit)	electric
	3. Twelve (12) (stored in Mini-Storage Unit)	air

ATTACHMENT 4
Page 1 of 2
Unit 1 Railroad Airlock Equipment List

A. Operations

APPROXIMATE QUANTITY	ITEM
5	Extinguishers
10	SCBA Packs
20	Extra Bottles (SCBA)
-	All turnout gear for off-duty personnel
1	Southport Vehicle (per agreement)
-	*All R-1, R-2, and R-3 Emergency Response Vehicles from Operations

*

NOTE:	The R-1 Emergency Vehicle should be connected to a 120 VAC outlet to ensure the charging system is energized.

Unit 1 Railroad Airlock Equipment List

B. Maintenance

APPROXIMATE QUANTITY	ITEM
1	Compressor
1	Gas welder with 8000 Watt generator
2	Air diaphragm pumps
1	Wet vac with 55 gal. Drum
5	Drop lights
7	Extension cords (50')
2	Gas powered pumps with suction/discharge hoses
3	100' sections of air hose
1	Generator (110/220 V) with spare spark plug taped to gas tank, fueled
4	Safety cans (5 gal) with gasoline
1 roll	Plastic
1 roll	Rope (1/2")
2 rolls	Duct tape

NOTE:	Stage gang box from mini-storage unit in Unit 1 Railroad Airlock.

Recommended Staffing for Severe Weather Events

R9 **I. EMERGENCY FACILITY/PLANT STAFFING DURING STORM**

> **NOTE:** Staffing normally consists of two (2) teams of personnel working 12 hour shifts. Staffing includes one (1) team of ERO personnel who meet NUREG-0654, Table B-1 minimum staffing requirements.

POSITION	TOTAL NUMBER OF PERSONNEL
Site Emergency Coordinator	2
Plant Operations Director	2
Technical Assessment Director *	2
Accident Assessment Team Leader *	2
Accident Assessment Team *	10
Radiological Control Director	2
TSC ERFIS Operator	1
Communications Director	2
Security Director	2
Security Lieutenant	2
Security Guards	Per Security Plan
TSC Administrative/Clerical	2
Control Room Shift	36
Emergency Repair Director	2
OSC Mission Coordinator	2
E&RC Coordinator	2

*Any combination of the above must collectively provide:

- One (1) Core/Thermal Hydraulics Engineer
- One (1) Mechanical Engineer
- One (1) Electrical Engineer

Recommended Staffing for Severe Weather Events

R9 **I. EMERGENCY FACILITY/PLANT STAFFING DURING STORM (Continued)**

> **NOTE:** Staffing normally consists of two (2) teams of personnel working 12 hour shifts. Staffing includes one (1) team of ERO personnel who meet NUREG-0654, Table B-1 minimum staffing requirements.

POSITION	TOTAL NUMBER OF PERSONNEL
Health Physics Technicians	13 (1 assigned to EOF/TSC)
Chemistry Technicians	6
Mechanical Planner	2
I&C Planner	2
Mechanical Maintenance	10
I&C Maintenance	10
Emergency Response Manager	2
AERM/County EOC Representative (may be located at Co. EOCs)	4
Radiological Control Manager	2
Dose Projection Coordinator	2
EOF ERFIS Operator	1
EOF Administrative/Clerical	2
Communications Managers	3
Phone Talkers	2
Environmental Monitoring Team	4
Emergency Preparedness Representative	2
Administrative/Logistics Manager	2
Telecommunications	1
NRC	3

Recommended Staffing for Severe Weather Events

R9 **II. RESTORATION STAFFING**

NOTE: Numbers are approximate and depend on estimated extent of restoration effort.

POSITION	TOTAL NUMBER OF PERSONNEL
Onsite Restoration Support	
Onsite Restoration Coordinator	1
Mechanical Maintenance Supervisors	3
Mechanical Maintenance Planners	2
Mechanical Maintenance Personnel	16
I&C Maintenance Supervisors	2
I&C Maintenance Personnel	20
E&RC Supervisor	2
E&RC Personnel	14
Scheduling Personnel	2
Engineering Supervisor	2
Engineering Personnel (2 individuals/subunit)	30

Offsite Emergency Preparedness Support	
Offsite EP Coordinator	1
Emergency Preparedness Staff	3
Communications Manager or Phonetalker Experienced Individuals	2
Emergency Facility Inventory Personnel	3
0PEP-04.6 Inventory Personnel	2 E&RC / 1 Ops

NOTE: Additional recovery actions are provided in 0PEP-02.7, Recovery.

Recommended Staffing for Severe Weather Events

R9 **II. RESTORATION STAFFING (Continued)**

POSITION	TOTAL NUMBER OF PERSONNEL
Siren Observers	6
Siren Troubleshooting Repairs/Distribution Personnel	2
Siren Troubleshooting Repairs/Telecomm. Personnel	2
Licensing Experienced Individual	1
Letter of Agree./Co. Emer. Mgmt. Interviews Personnel	2
JIC Company Spokesperson and two (2) Co. EOC Rep. Experienced Individuals	3

People Support	
People Issues Coordinator	1
Assistants (Mat. & Con. Serv. Individuals)	2
Home Repairs Team	4

NOTE: Additional recovery actions are provided in 0PEP-02.7, Recovery.

R9

Recommended Minimum System Walkdowns for Severe Weather

System Number	Description
1002	Roof Pseudo System
4015	Circulating Water
4040	Screen Wash Water
4045	Intake, Discharge Canal
4060	Service Water
5065	Generator Isolated Phase Bus
5095	Diesel Generator
5100	Diesel Fuel Oil
5105	Diesel Lube Oil
5110	Diesel Jacket Water & DG Demin Water
5111	DG Service Water
5112	Diesel Generator Starting Air
5113	Diesel Generator Intake/Exhaust
5135	230 KV Switchyard
5145	Start-up Aux. & Unit Auxiliary Transformer
5200	24KV Switchyard
5250	Lightning Protection
6070	Meteorological & Environmental
6152	Pneumatic Nitrogen
6160	Hydrogen Supply (HP, HPH)
6202	Fuel Oil
6210	Sewage Treatment
6215	Sewage, Sanitary, & Roof Drains
6220	Storm Drains
6225	Oil Drains
6261	Chlorination

Recommended Minimum System Walkdowns for Severe Weather

System Number	Description
6281	Hydrogen Water Chemistry
7070	Augmented Offgas
8035	Relay Building
8040	Caswell Beach Ocean Discharge Building
8045	Grounds Maintenance/Landscaping
8195	Gantry Cranes
8230	Service Water Building
8240	Reactor Building
8260	Turbine Building Ventilation
8270	Augmented Off-Gas Building and HVAC
8290	Chlorination Building
8300	Administration Building
8306	EOF/TSC/Simulator
8307	Technical & Administration Center
8310	Auxiliary Boiler House
8340	DG Bldg and Tank Vault
8355	Control Building
8360	Service Building
8370	Turbine Building
8380	Warehouses
8390	Radwaste Building
8400	Water Treatment Building
8435	Oil & Paint Storage
8510	Site Roads & Parking Lots
8515	Site Railroad Spurs
8565	Document Control Building & HVAC
8580	Misc. Structures/Out Bldgs.

Tropical Conditions Action Matrix

Process

The following matrix is a management tool intended to initiate thought processes related to possible wind conditions. It is not meant to be a procedure describing mandatory actions, or supersede actions in approved procedures. The decision of whether to shut down the units during hurricane situations still resides with plant management and the Control Room staff. The Action Matrix will not take precedence over management discretion, or override Conservative Decision Making on the part of the Control Room.

The path of information dissemination from Weather Service International (WSI) is intended to be processed through the EOF/TSC, but depending on circumstances, the Operations Shift Manager may be the first point of contact.

EPL-001 provides a list of both BNP and WSI points of contact.

Tropical Conditions Action Matrix

Milestone	Action to be taken	Basis for Action
Possibility of site affected by tropical conditions	Initiate contact with Weather Services International (WSI).	Open line of communications and allows ease of a possible implementation of Action Matrix.
Tropical Storm Watch issued for the Brunswick County geographic area	Emergency Preparedness conducts periodic briefings with WSI for predictions and probabilities related to path, strengthening, and potential impact on BNP. Document the specifics of the briefing on Attachment 8 and provide the information to plant management.	Allows the site to be aware of changes in the storm to allow for proactive preparatory actions.
Tropical Storm Warning issued for the Brunswick County geographic area	Emergency Preparedness continues periodic briefings with WSI, using Attachment 8, providing the information to management. Management considers referencing 0AOP-13.0 and 0AI-68 to start the site preparations for tropical conditions. Notifying Outage and Scheduling management to consider expediting the return of equipment needed during storm conditions.	Allows the site to be aware of changes in the storm to allow for proactive preparatory actions, if desired.
HURRICANE WATCH issued for the Brunswick County geographic area	Ensure entry into 0AOP-13.0 and 0AI-68 for required actions and begin monitoring wind predictions with WSI, if not previously started.	Driven by procedure

Tropical Conditions Action Matrix

HURRICANE WARNING issued for the Brunswick County geographic area	Ensure entry into 0PEP-02.1 to address EALs. Alert ERO team to be ready to man facilities.	Driven by procedure
The probability that the site will experience sustained hurricane force winds, >73 mph, within 10 hours reaches 50% (as determined by WSI)	Make recommendations to reduce power on both units. Man ERO facilities.	Ten hours allows for orderly power reduction on one unit at a time without introducing time pressure on the operators.
Probability that the site will experience sustained hurricane force winds within four hours reaches 80% (as determined by WSI)	Make recommendations to shutdown the reactors and remain in a hot shutdown (Mode 3) condition.	Four hours allows for staggered shutdown of the units without introducing time pressure on the operators.
Actions to transition to cold shutdown (Mode 4)	Make recommendations based on management discretion considering the overall safety benefits to be gained.	Consideration is given to the Emergency Action Levels for upgrading due to Hurricane induced conditions.

ATTACHMENT 8
Page 1 of 1

Weather Discussion Sheet

Applicable weather advisory :

- None ____
- Tropical Storm Watch ____
- Tropical Storm Warning ____
- Hurricane Watch ____
- Hurricane Warning ____

Time/Date of contact- _____/_____ Sequential Contact #- _____

Name of Storm/Category- _____

Storm specifics:

1. Time/Date of advisory _____ (EST/EDT)circle one
2. Position _____° N _____° W
3. Movement/Speed _____ kts
4. Sustained wind speed/Gusts _____ kts
5. Central pressure _____ mb

Probability of sustained Hurricane force winds on site in the next:

- 2 hours _____% (applicable to hurricane warning only)
- 4 hours _____% (applicable to hurricane warning only)
- 10 hours _____% (applicable to hurricane watch/warning only)
- 24 hours _____% (applicable to hurricane watch/warning only)

Specifics to the discussions with the meteorologist:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Signed _____ Date _____

REVISION SUMMARY

Revision 37 of 0AI-68 consists of the following changes:

- Corrected administrative errors (re-formatted Notes; added commas and semi-colons, as necessary; and capitalized words) without changing intent.
- Section 2.12: Changed reference from "0PM-ENG005, Covington Diesel Generator, Model 7123-7305" to "0PM-ENG541, EOF/TSC Emergency Generator Monthly PM Covington Diesel Generator, Model 7123-7305". 0PM-ENG005 has been superseded by 0PM-ENG541, EOF/TSC Emergency Generator Monthly PM Covington Diesel Generator, Model 7123-7305; 0PM-ENG542, EOF/TSC Emergency Generator Annual PM Covington Diesel Generator, Model 7123-7305; and 0PM-ENG543, EOF/TSC Emergency Generator Five Year PM Covington Diesel Generator, Model 7123-7305. (PRR #417441)
- Section 3.4 and Section 6.3.1.3.d: Changed "74 mph" to "73 mph" to correct wind speed for consistency with other references in procedure; consistency with wind speed description in 0AOP-13, Operation During Hurricane, Flood Conditions, Tornado, Or Earthquake"; and consistency with wind speed, as described in Saffir-Simpson scale (PRR #413307).
- Section 4.4; Section 6.2.1; and Attachment 7 (Page 1 of 3): Corrected title of "Shift Superintendent" to "Operations Shift Manager" due to PGN fleet-wide organization title change.
- Section 6.3.1.1: Changed "resolutions" to "resolution" to correct grammatical error.
- Section 6.3.1.2 Note and Attachment 2 (Page 26 of 27), Section 3.0 (Site Communications item): Changed "Brunswick Family Information Hotline" and "Emergency Family Information Hotline" respectively to Brunswick "Employee Information Hotline" as editorial correction.
- Attachment 1, General Unit Guidelines for Storm Preparations, Section 1.0: Deleted item to turn in company issued cellular telephones for issuance to Emergency Response Facilities. Also deleted instructions for Information Technology to coordinate return of cell phones in Attachment 2 (Page 1 of 27) and instructions for Emergency Preparedness to pre-stage cell phones in EOF and develop phone list in Attachment 2 (Page 5 of 27). It is no longer necessary to turn in cell phones and have them pre-staged for use during a severe weather event, because all ERO members have now been issued cell phones for emergency response; and the phones will be available, if needed (PRR #413760).

- Attachment 2 (Page 6 of 27), Section 1.0: Added Reactor Recirc VFD Building's (PDC) as new area of responsibility for Maintenance; also added checklist item for Mechanical Maintenance to secure doors and stage mop heads at the PDC in North Yard in Attachment 2, Section 3.0 (Page 15 of 27) as procedure enhancement (PRR #402837).
- Attachment 2 (Page 8 of 27): Section 3.0, first Action: Changed "protected area" to "Protected Area" as editorial correction.
- Attachment 2 (Page 12 of 27), Section 3.0: Added item for Mechanical Maintenance to drape netting over open storage bins and other equipment to prevent equipment from being introduced into the fuel pool as procedure enhancement (PRR #310627).
- Attachment 2 (Page 16 of 27), Section 3.0: In item for I&C/Electrical to start/load test EOF/TSC Diesel Generator, changed reference from "0PM-ENG505" to "0PM-ENG541" and added "by procedures 0EPM-ENG541, 0EPM-ENG542, or 0EPM-ENG543." to end of action. 0PM-ENG005 has been superseded by 0PM-ENG541, EOF/TSC Emergency Generator Monthly PM Covington Diesel Generator, Model 7123-7305; 0PM-ENG542, EOF/TSC Emergency Generator Annual PM Covington Diesel Generator, Model 7123-7305; and 0PM-ENG543, EOF/TSC Emergency Generator Five Year PM Covington Diesel Generator, Model 7123-7305. (PRR #417441)
- Attachment 2 (Page 22 of 27), Section 3.0: Deleted Operations item describing loss of power to the Brunswick Emergency Notification System (BENS). This item is no longer applicable, because the notification call-out system has been changed from Dialogics to Everbridge (PRR #353798).
- Attachment 7 (Page 1 of 3): Changed "control room" to "Control Room" as editorial correction.
- Attachment 7 (Page 2 of 3): First item, 3rd column: changed "allow" to "allows". Second item, 2nd column: Changed "conduct" to "conducts"; and Third item, 2nd column: Changed "consider" to "considers". These changes were made to correct grammatical errors.

Procedure 0AOP-13.0
"Operation During Hurricane, Flood Conditions, Tornado, or Earthquake"

PLANT OPERATING MANUAL

VOLUME XXI

ABNORMAL OPERATING PROCEDURE

UNIT
0

0AOP-13.0

OPERATION DURING HURRICANE, FLOOD CONDITIONS, TORNADO, OR EARTHQUAKE

REVISION 49

1.0 SYMPTOMS

NOTE: Notification of a hurricane or tornado warning will be provided to the control room from contract Meteorological Services, the Raleigh Load Dispatcher, or Security personnel.

1.1 A watch or warning has been issued by the National Weather Service.

1.2 News or weather report indicates possible flooding in the area.

1.3 Unstable weather conditions.

1.4 Increasing intake canal level (*SCW-LR-285/CW-LR-761* on XU-2).

1.5 *INTAKE CANAL LEVEL-HIGH* (UA-24 6-8) is in alarm.

1.6 *SEISMIC EVENT* (UA-28 6-4) is in alarm.

NOTE: Additional weather information may be obtained from the National Weather Service. Telephone numbers are in EPL-001.

2.0 AUTOMATIC ACTIONS

None

3.0 OPERATOR ACTIONS

3.1 Immediate Actions

None

3.2 Supplementary Actions

NOTE: Actions contained in this procedure for abnormal operating conditions are addressed as follows:

Condition	Step
Tornado	3.2.1
Earthquake	3.2.2
Hurricane	3.2.3
Flood	3.2.4

3.0 OPERATOR ACTIONS

3.2.1 **IF** a Tornado Warning **OR** Tornado Watch has been issued, **THEN PERFORM** the following:

1. **REFER** to 0AI-68 for additional actions. ☐

2. **IF** a Tornado Warning has been issued, **THEN PERFORM** the following:

   a. **TERMINATE** all unnecessary activities. ☐

   b. **IF** off-site power is **NOT** available, **THEN ENTER** 0AOP-36.1. ☐

   c. **NOTIFY** Maintenance to immediately unload and secure the Unit 1 and Unit 2 Reactor Building 117' cranes until the severe wind threat has passed ☐

   d. **IF** Control Room Air Conditioning Units are **NOT** available **AND** Control Room temperature is greater than or equal to 104°F, **THEN EXECUTE** compensatory actions in accordance with Attachment 5. ☐

   e. **ENSURE** Unit 2 Turbine Building Ventilation in Recirc alignment in accordance with 2OP-37.3. ☐

3. **IF** a Tornado Watch has been issued, **THEN PERFORM** the following:

   a. **SURVEY** outside areas to determine potential damages and preventive measures. ☐

   b. **REVIEW** all LCOs for equipment out of service. ☐

   c. **EXPEDITE** the return to service of all safety equipment, especially equipment required for loss of off-site power. ☐

3.0 OPERATOR ACTIONS

d. **IF** either Unit 1 or Unit 2 Reactor Building 117' cranes are in use, **THEN EVALUATE** continued use vs. the ability to secure the crane(s) if conditions change as follows;

- Local observation of weather and local weather reports **DO NOT** indicate an imminent threat. ☐
- Use of the crane(s) - Estimate the amount of time required to secure any lift in progress and secure the crane. ☐

e. **IF** time permits, **THEN ENSURE** the following:

- All doors on transformer cubicles, switchyard cubicles, fire hose cubicles, other cubicles and panels in outside areas are properly closed ☐
- All gas bottles and fire extinguishers are properly secured ☐
- All outside cranes are secure ☐
- All outside windows, doors, and severe weather doors are closed. (Attachment 3) ☐

NOTE: A Control Operator key is required to unlock SYA and SYB Cabinet doors. Security must be notified prior to unlocking these doors.

f. **IF** time permits **THEN ENSURE** all outside lights on as follows:

- **PLACE** light switch at MCC-SYA, Compt. BZ3 in *MANUAL*. ☐
- **PLACE** light switch at MCC-SYB, Compt. CC3 in *MANUAL*. ☐
- **PLACE** light switch at U1 TB, 70' between Dist Panel 1E-480V and S/E hot side entrance *ON*. ☐
- **PLACE** light switch at U2 TB, 70' between Dist Panel 2E-480V and N/E hot side entrance in *MANUAL/ON*. ☐

3.0 OPERATOR ACTIONS

g. **IF** time permits, **THEN REVIEW** the following procedures with shift personnel:

- 0AOP-36.1 ☐
- 0AOP-36.2 ☐
- The remainder of this procedure. ☐

4. **WHEN** the Tornado Warning **OR** Tornado Watch has expired, **THEN RETURN** plant equipment to normal. ☐

NOTE: A Control Operator key is required to unlock SYA and SYB Cabinet doors. Security must be notified prior to unlocking these doors.

5. **WHEN** the Tornado Warning **OR** Tornado Watch has expired, **THEN RETURN** plant lighting to normal as follows:

- **PLACE** light switch at MCC-SYA, Compt. BZ3 in *AUTO.* ☐
- **PLACE** light switch at MCC-SYB, Compt. CC3 in *AUTO.* ☐
- **PLACE** light switch at U1 TB, 70' between Dist Panel 1E-480V and S/E hot side entrance *OFF.* ☐
- **PLACE** light switch at U2 TB, 70' between Dist Panel 2E-480V and N/E hot side entrance in *AUTO/OFF.* ☐

6. **IF** a Tornado occurred, **THEN PERFORM** the following actions at the ISFSI area:

a. **CHECK** the Horizontal Storage Module (HSM) air inlet and outlet screens for blockage. ☐

- **IF** air inlet or outlet screens are blocked **AND** blockage is easily removable, **THEN REMOVE** blockage. ☐
- **IF** blockage is not easily removable, **THEN IMPLEMENT** applicable sections of 0AOP-41.0. ☐

3.0 OPERATOR ACTIONS

b. **NOTIFY** Maintenance to inspect visible portions of the following for cracks or other evidence of damage:

- HSMs ☐
- ISFSI foundation slab. ☐

c. **IF** the transfer cask (TC) is on site, **THEN NOTIFY** Maintenance to inspect the TC for damage. ☐

d. **IF** damage is evident, **THEN NOTIFY** Engineering to formulate a plan to repair affected ISFSI structures. ☐

3.0 OPERATOR ACTIONS

3.2.2 **IF** an Earthquake has occurred, **THEN PERFORM** the following:

1. **DISPATCH** an operator to determine the earthquake acceleration in accordance with Attachment 4. ☐

2. **CONFIRM** the occurrence of the seismic event by contacting the National Earthquake Center at 1-303-273-8500. ☐

3. **IF** the plant can **NOT** operate in a safe condition **OR** an OBE Exceedance is indicated (Attachment 4 Step 1.b RED **OR** Step 2.c LIT) during a confirmed earthquake, **THEN INITIATE** the following:

   - A controlled shutdown of both units in accordance with 0GP-05 ☐
   - An LCO for secondary containment integrity in accordance with OPS-NGGC-1305, due to possible link seal failure ☐
   - A WO to inspect the core shroud in the area of the core shroud brackets for evidence of shifting or movement. ☐

4. **CHECK** the following plant parameters to provide a quick check on the status of the units:

   - Reactor Power ☐
   - Reactor Pressure ☐
   - Reactor Level ☐
   - Area Radiation Monitors ☐
   - Feedwater Flow ☐
   - Generator Load ☐
   - Condenser Vacuum ☐
   - Turbine Vibration and Bearing Temperature. ☐

3.0 OPERATOR ACTIONS

5. **CHECK** the following for changes which may indicate core shroud movement at the top guide support ring reinforcing brackets:

   - Power/Flow relationship ☐
   - Flux variations (determined by the Nuclear Engineer) ☐
   - Rising suction temperature in one or both recirculation loops. ☐

6. **CHECK** the following for indications of power losses:

   - Electrical Distribution System ☐
   - Switchyard ☐
   - Grid System ☐

7. **CHECK** all annunciator panels (including local panels) for indications of abnormal conditions. ☐

8. **CHECK** the following systems for indications of abnormal conditions:

   - Main Steam Leak Detection ☐
   - RWCU System Leak Detection ☐
   - RCIC System Leak Detection ☐
   - HPCI System Leak Detection ☐
   - RHR System Leak Detection ☐
   - ADS Leak Detection ☐
   - Radwaste Equipment Area Leak Detection ☐
   - Reactor Recirculation Pump Leak Detection. ☐

3.0 OPERATOR ACTIONS

NOTE:	OBE Exceedance indication is equivalent to acceleration exceeding 0.08g.

9. **IF** the acceleration did **NOT** indicate an OBE Exceedance, **THEN INITIATE** an operability determination for secondary containment integrity, including an evaluation for link seals, in accordance with OPS-NGGC-1305. ☐

10. **INITIATE** a plan to inspect all plant equipment **AND** evaluate damage as soon as practical. ☐

11. **IF** damage is suspected on any system, **THEN PERFORM** the appropriate testing to ensure operability as soon as practical. ☐

12. **PERFORM** the following actions at the ISFSI area:

    a. **CHECK** the Horizontal Storage Module (HSM) air inlet and outlet screens for blockage. ☐

       - **IF** air inlet or outlet screens are blocked **AND** blockage is easily removable, **THEN REMOVE** blockage. ☐

       - **IF** blockage is not easily removable, **THEN IMPLEMENT** applicable sections of 0AOP-41.0. ☐

    b. **NOTIFY** Maintenance to inspect the visible portions of the following for cracks or other evidence of damage:

       - HSMs ☐

       - ISFSI foundation slab. ☐

    c. **IF** the transfer cask (TC) is on site, **THEN NOTIFY** Maintenance to inspect the TC for damage. ☐

    d. **IF** damage is evident, **THEN NOTIFY** Engineering to formulate a plan to repair affected ISFSI structures. ☐

3.0 OPERATOR ACTIONS

13. **IF** a seismic event is confirmed, **THEN INITIATE** a WO to remove the record plates from the peak shock recorders so that they may be forwarded to the vendor for evaluation.(reference TRM 3.9 Condition C and Bases) ☐

14. Perform the following Seismic Monitoring Channel Calibration procedures;

    - 2MST-SEIS21R (after 5 days and within 10 days of the event). ☐

    - 2MST-SEIS22R (after 5 days and within 10 days of the event). ☐

15. **IF** Control Room Air Conditioning Units are **NOT** available **AND** Control Room temperature is greater than or equal to 104°F, **THEN EXECUTE** compensatory actions in accordance with Attachment 5. ☐

3.0 OPERATOR ACTIONS

NOTE:	A hurricane is defined as a weather condition with sustained wind speeds in excess of 73 miles per hour as provided by the National Weather Service.

3.2.3 **IF** a Hurricane Watch or Warning has been issued **OR** Hurricane Conditions exist, **THEN PERFORM** the following:

1. **REFER** to 0AI-68 for additional actions. ☐

2. **IF** a Hurricane Watch has been issued, **THEN PERFORM** the following:

   a. **SURVEY** outside areas to determine potential damages and preventive measures. ☐

   b. **REVIEW** all LCOs for equipment out of service. ☐

   c. **EXPEDITE** the return to service of all safety equipment, especially equipment required for loss of off-site power. ☐

3. **IF** a Hurricane Warning has been issued, **THEN PERFORM** the following:

   a. **REVIEW** the following procedures with shift personnel:

      - 0AOP-36.1 ☐
      - 0AOP-36.2 ☐
      - The remainder of this procedure. ☐

   b. **ENSURE** the following:

      - All doors on transformer cubicles, switchyard cubicles, fire hose cubicles, other cubicles and panels in outside areas are properly closed ☐
      - All gas bottles and fire extinguishers are properly secured ☐
      - All outside cranes are secure ☐

3.0 OPERATOR ACTIONS

- All outside windows, doors, and severe weather doors are closed. (Attachment 3) ☐

NOTE: A Control Operator key is required to unlock SYA and SYB Cabinet doors. Security must be notified prior to unlocking these doors.

c. **ENSURE** all outside lights on as follows:

- **PLACE** light switch at MCC-SYA, Compt. BZ3 in *MANUAL*. ☐
- **PLACE** light switch at MCC-SYB, Compt. CC3 in *MANUAL*. ☐
- **PLACE** light switch at U1 TB, 70' between Dist Panel 1E-480V and S/E hot side entrance *ON*. ☐
- **PLACE** light switch at U2 TB, 70' between Dist Panel 2E-480V and N/E hot side entrance in *MANUAL/ON*. ☐

d. **COMPLETE** Attachments 1 and 2 to track the hurricane path and record anticipated hurricane arrival at the site.

e. **SHUTDOWN** the Storage Tank Lube Oil Conditioner in accordance with 0OP-49. ☐

NOTE: MUD tank transfer should **NOT** fill the CSTs such that normal Radwaste processing to the CSTs will be restricted.

f. **TRANSFER** available water from MUD Tank to the CST. ☐

g. **CONTACT** maintenance to secure the Reactor Building Chillers prior to storm arrival. ☐

h. **NOTIFY** Maintenance to immediately unload and secure the Unit 1 and Unit 2 Reactor Building 117' cranes until the severe wind threat has passed. ☐

i. **ENSURE** Unit 2 Turbine Building Ventilation in Recirc alignment in accordance with 2OP-37.3. ☐

3.0 OPERATOR ACTIONS

NOTE: Both Units must be in Mode 3 at least 2 hours prior to the anticipated arrival of the hurricane at the site.

NOTE: Loss of all AC power would result in a loss of all low pressure cooling water injection capability.

j. **INITIATE** actions necessary to prepare to place both units in at least Mode 3. ☐

k. **IF** the Units are being taken to Mode 4, **THEN MAINTAIN** plant conditions as necessary to allow entering Mode 3 during the storm. ☐

CAUTION

Load testing of EDGs should **NOT** be performed during periods of potential grid instability.

l. **START AND LOAD TEST** each diesel generator in accordance with 0OP-39 that has **NOT** been load tested in the previous 7 days. ☐

m. **IF** flood conditions are expected at the site or Caswell Beach Pumping Station, **THEN GO TO** Step 3.2.4 **AND PERFORM CONCURRENTLY**. ☐

n. **TERMINATE** all unnecessary activities. ☐

NOTE: Drywell pressure changes will occur as the eye of the hurricane approaches and departs the site.

o. **WHEN** the anticipated arrival of the hurricane is within 8 hours, **THEN PERFORM** the following at Caswell Beach Pumping Station:

- **ENSURE** all equipment is stowed and secure ☐
- **ENSURE** all controls in remote ☐
- **BACKWASH** lube water strainers ☐

- **PLACE** all available lube water pumps in operation ☐

- **MONITOR** discharge canal level. ☐

NOTE: The individual below should be assigned prior to conditions that would prevent or delay access. Adequate food supplies should be available if an extended stay is expected.

p. **ASSIGN** at least one individual dedicated locally to the following buildings:

- Diesel Generator Building ☐

- Service Water Building. ☐

q. **ARRANGE** with diesel fuel suppliers for deliveries following passage of the hurricane. ☐

4. **IF** Hurricane Conditions exists, **THEN PERFORM** the following:

a. **MAINTAIN** communications with Load Dispatcher for weather conditions. ☐

b. **IF** off-site power is **NOT** available, **THEN ENTER** 0AOP-36.1. ☐

c. **MONITOR** the intake canal water level. ☐

- **IF** the intake canal water level increases to greater than or equal to +15 feet MSL, **THEN RECORD** canal level at least once per two hours **AND COMPLY** with the Technical Requirements Manual 3.20. ☐

- **PRIOR** to intake canal water level reaching -5 feet MSL, **REFERENCE** 1(2)OP-29 Precautions for required actions associated with the circulating water system. ☐

3.0 OPERATOR ACTIONS

NOTE:	RBCCW and RHR service water flows may be reduced as necessary to maintain NSW pressure.

- **IF** the intake canal water level decreases to less than or equal to -5 feet MSL, **THEN MAINTAIN** greater than 63 psig in the NSW headers. ☐
- **IF** the intake canal water level decreases to less than or equal to - 6 feet MSL, **THEN REFERENCE** Tech Spec 3.7.2. ☐

d. **IF** flooding conditions occur at the site or Caswell Beach Pumping Station, **THEN GO TO** Step 3.2.4 **AND PERFORM CONCURRENTLY**. ☐

e. **IF** the Caswell Beach Substation is lost, **THEN PERFORM** the following:

- **OPEN** the 23 Kv feeder ☐
- **PLACE** the feeder under clearance. ☐

NOTE:	A Control Operator key is required to unlock SYA and SYB Cabinet doors. Security must be notified prior to unlocking these doors.

5. **WHEN** the Hurricane Watch or Warning **OR** Hurricane Conditions have expired, **THEN RETURN** plant lighting to normal as follows:

- **PLACE** light switch at MCC-SYA, Compt. BZ3 in *AUTO*. ☐
- **PLACE** light switch at MCC-SYB, Compt. CC3 in *AUTO*. ☐
- **PLACE** light switch at U1 TB, 70' between Dist Panel 1E-480V and S/E hot side entrance *OFF*. ☐
- **PLACE** light switch at U2 TB, 70' between Dist Panel 2E-480V and N/E hot side entrance in *AUTO/OFF*. ☐

3.0 OPERATOR ACTIONS

6. **WHEN** Hurricane Conditions have expired, **THEN PERFORM** the following actions at the ISFSI area:

   a. **CHECK** the Horizontal Storage Module (HSM) air inlet and outlet screens for blockage. ☐

      - **IF** air inlet or outlet screens are blocked **AND** blockage is easily removable, **THEN REMOVE** blockage. ☐

      - **IF** blockage is not easily removable, **THEN IMPLEMENT** applicable sections of 0AOP-41.0.

   b. **NOTIFY** Maintenance to inspect visible portions of the following for cracks or other evidence of damage:

      - HSMs ☐

      - ISFSI foundation slab.

   c. **IF** the transfer cask (TC) is on site, **THEN NOTIFY** Maintenance to inspect the TC for damage. ☐

   d. **IF** damage is evident, **THEN NOTIFY** Engineering to formulate a plan to repair affected ISFSI structures. ☐

   e. **IF** flooding of the ISFSI area has occurred, **THEN CHECK** the HSM inlet vents for silt deposits. ☐

   f. **IF** silt deposits are present in the HSMs, **THEN NOTIFY** Maintenance to remove the deposits using:

      - A suction hose inserted through the inlet vent ☐

        OR

      - A high velocity water flow to flush the silt out through the inlet vent. ☐

3.0 OPERATOR ACTIONS

3.2.4 **IF** flooding of the site or Caswell Beach Pumping Station is expected **OR** has occurred, **THEN PERFORM** the following:

1. **IF** flooding of the site is expected, **THEN PERFORM** the following:

   a. **ENSURE** the following:

   - All doors on transformer cubicles, switchyard cubicles, fire hose cubicles, other cubicles and panels in outside areas are properly closed ☐
   - All gas bottles and fire extinguishers are properly secured ☐
   - All outside cranes are secure ☐
   - All outside windows, doors, and severe weather doors are closed. (Attachment 3) ☐

NOTE: A Control Operator key is required to unlock SYA and SYB Cabinet doors. Security must be notified prior to unlocking these doors.

   b. **ENSURE** all outside lights on as follows:

   - **PLACE** light switch at MCC-SYA, Compt. BZ3 in *MANUAL*. ☐
   - **PLACE** light switch at MCC-SYB, Compt. CC3 in *MANUAL*. ☐
   - **PLACE** light switch at U1 TB, 70' between Dist Panel 1E-480V and S/E hot side entrance *ON*. ☐
   - **PLACE** light switch at U2 TB, 70' between Dist Panel 2E-480V and N/E hot side entrance in *MANUAL/ON*. ☐

   c. **CONFIRM** proper operation of sump pumps **AND PLACE** their control switches in *AUTO*. ☐

   d. **CONTACT** maintenance to ensure installation of portable pumps in accordance with 0AI-68 and additional locations as necessary. ☐

3.0 OPERATOR ACTIONS

e. **CLOSE** the seal openings to the Diesel Generator Building and fuel oil four-day tank vaults. ☐

NOTE: The individual below should be assigned prior to conditions that would prevent or delay access. Adequate food supplies should be available if an extended stay is expected.

f. **ASSIGN** at least one individual dedicated locally to the following buildings:

- Diesel Generator Building ☐
- Service Water Building. ☐

g. **IF** the intake canal increases to greater than or equal to +4 feet MSL, **THEN:**

- **REQUEST** Chemistry to sample the fish flume for residual chlorine. ☐
- **IF** residual chlorine is detected, **THEN REQUEST** Chemistry secure Sodium Hypochlorite injection to the service water system. ☐

NOTE: Chlorination is out of service but has **NOT** been decommissioned.

- **IF** in operation, **THEN SECURE** service water chlorination to prevent carryover to the Screen Wash System. ☐

h. **IF** the intake canal water level increases to greater than or equal to +15 feet MSL, **THEN PERFORM** the following:

- **RECORD** canal level at least once per two hours ☐
- **COMPLY** with the Technical Requirements Manual 3.20. ☐

3.0 OPERATOR ACTIONS

NOTE:	The plant should reach Mode 4 within 2 hours of reaching the +20 feet MSL.

i. **IF** the flood is expected to increase to greater than or equal to +20 feet MSL, **THEN COMMENCE** a plant shutdown. ☐

2. **IF** flooding of the site has occurred, **THEN PERFORM** the following:

   a. **CONTACT** the National Weather Service or Load Dispatcher to determine the predicted flood crest time and level. ☐

   b. **IF** the intake canal water level increases to greater than or equal to +15 feet MSL, **THEN PERFORM** the following:

      - **RECORD** canal level at least once per two hours ☐
      - **COMPLY** with the Technical Requirements Manual 3.20. ☐

   c. **CONFIRM** proper operation of sump pumps. ☐

   d. **MONITOR** the following panels in conjunction with local tours to determine if any areas are being flooded:

      - Panel UA-12 ☐
      - Panel UA-28 ☐
      - Panel XU-51 ☐

   e. **OPERATE** permanent or portable sump pumps as necessary to control water level inside the buildings. ☐

3.0 OPERATOR ACTIONS

NOTE: Releasing water directly to the discharge canal through the Storm Drain Basin overflow valves is prohibited by the NPDES permit except:

- Where unavoidable to prevent loss of life or severe property damage (Preventing basin level from reaching 15'-6" satisfies this condition)
- Where excessive storm drainage or run-off would damage any facilities necessary for compliance with the effluent limitations of the NPDES permit.

f. **IF** flooding occurs at the Storm Drain Basin, **THEN PERFORM** the following:

- **MAINTAIN** the Strom Drain Basin level in accordance with 0OP-54. ☐
- **NOTIFY** E&RC immediately. ☐
- **NOTIFY** Environmental Compliance Unit within 24 hours. ☐

3. **IF** flooding at the Caswell Beach Pumping Station is expected, **THEN PERFORM** the following within 8 hours of the anticipated arrival:

a. **ENSURE** the following:

- All equipment is stowed and secure ☐
- All controls are in remote ☐
- Lube Water Strainers are backwashed ☐
- All available lube water pumps are in operation. ☐

4. **IF** flooding Caswell Beach Pumping Station has occurred, **THEN PERFORM** the following:

a. **ATTEMPT** to restart any pumps that have been lost. ☐

3.0 OPERATOR ACTIONS

NOTE:	Attempts should be made to maintain at least one OD Pump running on each ocean discharge pipe.

b. **IF** necessary, **THEN STOP** Circulating Water Intake Pumps to maintain discharge canal level. ☐

c. **IF** the Caswell Beach Substation is lost, **THEN PERFORM** the following:

- **OPEN** the 23 Kv feeder ☐
- **PLACE** the feeder under clearance. ☐

d. **INITIATE** a safe shutdown of the units. ☐

e. **IF** Caswell Beach Pumping Station is lost, **THEN MAINTAIN** the condenser available as a heat sink as long as possible. ☐

5. **WHEN** notified by the Raleigh Load Dispatcher or the National Weather Service the flood has crested and is **NOT** likely to reoccur, **THEN PERFORM** the following as areas become accessible:

a. **INSPECT** all equipment submerged by water. ☐

b. **CLEAN** all areas and flush piping, sumps, etc., as required. ☐

c. **WHEN** all sump pump levels are normal, **THEN REMOVE** all portable pumps. ☐

d. **MEGGER** all electrical equipment, power and control cables submerged by water **AND INITIATE** appropriate maintenance activities. ☐

e. **REPLACE OR REPAIR** damaged equipment. ☐

f. **IF** secured, **THEN RESTART** Caswell Beach Pumping Station equipment as conditions permit. ☐

g. **IF** Storm Drain Basin overflow valves were opened to maintain level, **THEN ENSURE** valves are closed in accordance with 0OP-54. ☐

3.0 OPERATOR ACTIONS

h. At the ISFSI area, **CHECK** the Horizontal Storage Modules (HSM) air inlet and outlet screens for blockage.

- **IF** air inlet or outlet screens are blocked **AND** blockage is easily removable, **THEN REMOVE** blockage. ☐
- **IF** blockage is not easily removable, **THEN IMPLEMENT** applicable sections of 0AOP-41.0. ☐

i. At the ISFSI area, **CHECK** the HSM inlet vents for silt deposits. ☐

j. **IF** silt deposits are visible in the HSM inlet vents, **THEN NOTIFY** Maintenance to remove silt deposits using:

- A suction hose inserted through the inlet vent ☐

  OR

- A high velocity water flow to flush silt out through the inlet vent. ☐

NOTE:	A Control Operator key is required to unlock SYA and SYB Cabinet doors. Security must be notified prior to unlocking these doors.

k. **RETURN** plant lighting to normal as follows:

- **PLACE** light switch at MCC-SYA, Compt. BZ3 in *AUTO*. ☐
- **PLACE** light switch at MCC-SYB, Compt. CC3 in *AUTO*. ☐
- **PLACE** light switch at U1 TB, 70' between Dist Panel 1E-480V and S/E hot side entrance *OFF*. ☐
- **PLACE** light switch at U2 TB, 70' between Dist Panel 2E-480V and N/E hot side entrance in *AUTO/OFF*. ☐

6. **WHEN** the flood has receded to less than +17 feet 6 inches MSL, **THEN REFER** to the following:

- 0GP-01 ☐
- Technical Requirements Manual 3.20. ☐

4.0 GENERAL DISCUSSION

This abnormal operating procedure (AOP) partially fulfills the requirements of Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation) (November 1972) and Regulatory Guide 1.155, Station Blackout.

R26 This AOP also addresses SOER 2002-01 Severe Weather, recommendations 2 (emergency planning arrangements), 4a (securing equipment and placement of pumps), 4c (verification of safety related equipment operability), 5a (authority and responsibility of the operations shift staff), and 5b (decision making such as unit shutdown requirements.

Actions to take at the Independent Spent Fuel Storage Installation (ISFSI) are also addressed. NUHOMS ISFSI is designed to be located anywhere within the contiguous United States and to withstand the most severe tornado and wind loadings specified by NRC Regulatory Guide 1.76 and NUREG-0800 (i.e., 360 mph). This also envelops extreme winds due to hurricanes. The HSM foundation and NUHOMS System were design to meet a horizontal seismic acceleration of 0.3g and a vertical acceleration of 0.2g which exceeds the design basis earthquake loading that BSEP was predicated upon. At BSEP, the maximum instantaneous water height for a hurricane with wave action is at elevation 25.6'. The ISFSI pad is above this elevation at 26' 2". Additionally, the DSC and HSM are designed for a design basis flood event of 50' with a water current of 15 fps impinging on the side of the submerged HSM. These actions are in accordance with Transnuclear, Certificate of Compliance 1004 amendment 10, Updated Final Safety Analysis Report for the Standardized NUHOMS® Horizontal Modular Storage System for Irradiated Nuclear Fuel. NGGM-PM-0028, Transnuclear NUHOMS Dry Fuel Storage Program Manual, contains links to the TN UFSAR. Refer to section T.11.2, Postulated Accidents, for additional information.

Brunswick is geographically located in close proximity to the Atlantic coastal storm track and has an approximate grade elevation of 20 feet above mean sea level (MSL). Hurricanes and tropical storms are therefore, the most extreme weather phenomena that affect the site area. Potential subsequent flooding should be considered even though the plant structures were designed to compensate, via installed sump pumps, for a maximum site flooding depth of 22 feet above MSL during the maximum probable hurricane. Tornados should also be a concern since they are frequently observed to be associated with hurricanes and tropical storms.

Transformers, switchyard equipment, and transmission lines are very vulnerable to high speed wind conditions. Therefore, a loss of off-site power should be expected. Other equipment and structures in the outside areas are likely to be damaged and supplemental precautionary measures should be taken.

Brunswick Units have been designed to meet a Design Basis Earthquake (DBE) of 0.16g ground acceleration at the Reactor Building Foundation. This correlates to an earthquake with a magnitude of ~6.0 on the Richter Scale. An earthquake with a magnitude of ~7.0 on the Richter Scale occurred in Charleston, S.C., on August 31, 1886.

5.0 REFERENCES

5.1 Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation) (November 1972), Appendix A, Item F.24

5.2 Regulatory Guide 1.155, Station Blackout

5.3 ANSI Standard N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, Section 5.3.9.2, Item (11)

5.4 NUMARC-87-00, Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors

5.5 PEP-02.1, Initial Emergency Actions

5.6 0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings

5.7 0AOP-36.1, Loss Off Any 4160 Buses Or 480V E-Buses

5.8 0AOP-36.2, Station Blackout

5.9 2MST-SEIS21R, Condor Seismic Monitoring System Chan Cal

5.10 2MST-SEIS22R, Peak Shock Recorder Seismic Monitoring System Chan Cal

5.11 0OP-54, Storm Drain Collector Basin Operating Procedure

5.12 0OP-39, Diesel Generator Operating Procedure

5.13 0OI-01.07, Notifications

5.14 0OI-01.08, Control Of Equipment And System Status

5.15 ELP-001, Emergency Phone List

5.16 0GP-05, Unit Shutdown

5.17 EER 90-0084, Consolidation of Previous EERs Re. SWS

5.18 Technical Manual FP-82351, Seismic Monitoring System

5.0 REFERENCES

5.19 EER 93-0536, Evaluation of Unit 1 Core Shroud Indications and Operability Assessment of Units 1 and 2

5.20 PM 93-038, Unit 1 Core Shroud Modification

5.21 PM 94-007, Unit 2 Core Shroud Modification

5.22 0E&RC-2009, Radioactive Liquid Effluent Releases and Reports

5.23 8S42-P-101, BNP Station Blackout Coping Analysis Report

5.24 Technical Specifications

5.25 Technical Requirements Manual

R26 5.26 SOER 02-1, Severe Weather

5.27 OPS-NGGC-1305, Operability Determinations

5.28 0PLP-01.2, Fire Protection System Operability, Action, And Surveillance Requirements

5.29 2OP-37.3 Turbine Building Heating And Ventilation System

NOTE: NGGM-PM-0028 includes link to the Certification of Compliance 1004 Amendment 10 NRC Approval Letter dated August 24, 2009 Technical Specifications and access to Transnuclear, Certificate of Compliance 1004 amendment 10, Updated Final Safety Analysis Report for the Standardized NUHOMS® Horizontal Modular Storage System for Irradiated Nuclear Fuel.

5.30 NGGM-PM-0028, Transnuclear NUHOMS Dry Fuel Storage Program Manual

5.31 0AOP-41.0, Independent Spent Fuel Storage Installation Abnormal Events

5.32 Regulatory Guide 1.76, Design-Basis tornado and Tornado Missiles for Nuclear Power Plants.

5.33 NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants.

5.34 0OI-01.01, BNP Conduct of Operations Supplement

6.0 ATTACHMENTS

1 Hurricane Tracking Data

2 Hurricane Tracking Map

3 Severe Weather Doors

4 Earthquake Acceleration Determination

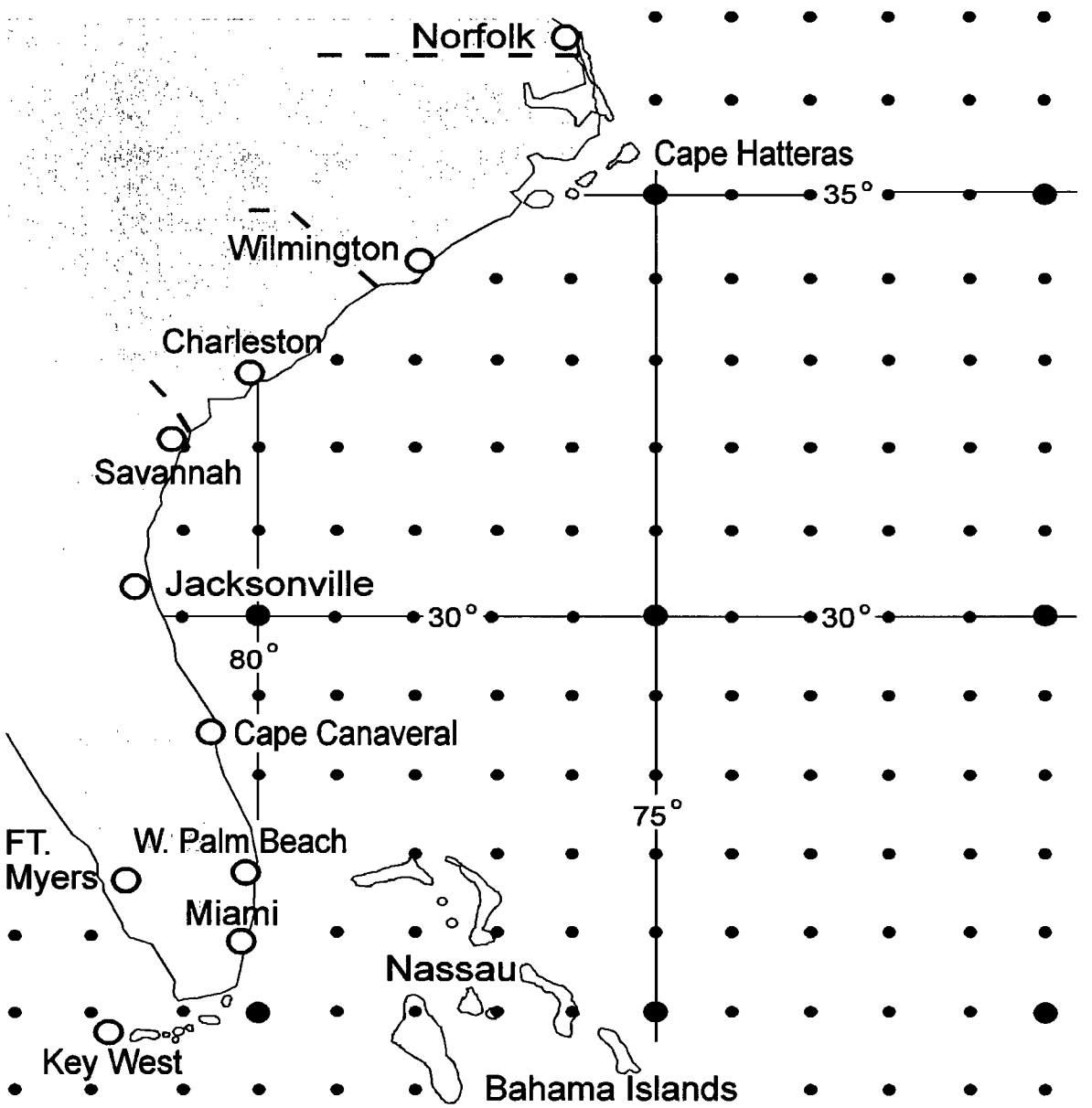
5 Compensatory Actions for Control Room Heat Removal

ATTACHMENT 1
Page 1 of 1
Hurricane Tracking Data

Date	Time	Longitude	Latitude	Anticipated Hurricane Arrival at BSEP*

*Required only after Hurricane Warning issued.

ATTACHMENT 2
Page 1 of 1
Hurricane Tracking Map



Severe Weather Doors

NOTE: When completed, this attachment shall be retained as a QA record.

NOTE: All doors are required to be closed as indicated. Doors not required to be closed for the type of severe weather expected may be marked N/A.

Rx Bldg Description	Elev.	Unit	Door No.	Remarks	Initial
Railroad Doors	20 ft.	1	209		
Railroad Doors	20 ft.	1	210		
Airlock-West Wall	20 ft.	1	203		
Airlock-West Wall	20 ft.	1	204		
Airlock-West Wall	50 ft.	1	301		
Airlock-West Wall	50 ft.	1	302		
Airlock-South Wall	50 ft.	1	303		
Airlock-South Wall	50 ft.	1	304		
Airlock	80 ft.	1	402		
Airlock	80 ft.	1	403		
Airlock	167 ft.	1	801	Confirm with Security	
Roof Hatch	179 ft.	1	901	Confirm with Security	
Railroad Doors	20 ft.	2	209		
Railroad Doors	20 ft.	2	210		
Airlock-West Wall	20 ft.	2	203		
Airlock-West Wall	20 ft.	2	204		
Airlock-West Wall	50 ft.	2	301		
Airlock-West Wall	50 ft.	2	302		
Airlock-North Wall	50 ft.	2	303		
Airlock-North Wall	50 ft.	2	304		
Airlock	80 ft.	2	402		
Airlock	80 ft.	2	403		
Airlock	167 ft.	2	801	Confirm with Security	
Roof Hatch	179 ft.	2	901	Confirm with Security	

Severe Weather Doors

Control Bldg Description	Elev.	Unit	Door No.	Remarks	Initial
North Cable Access Way	49 ft.	-	218		
Elevator Room	70 ft.	-	301		
HVAC Equipment Room South Hatch	70 ft.	-	302A		
HVAC Equipment Room South Entrance	70 ft.	-	302B		
HVAC Equipment Room East Wall	70 ft.	1	304A		
HVAC Equipment Room East Wall	70 ft.	-	304B		
Cable Spread Area-West Wall	23 ft.	2	101A	Tornado Only	
Cable Spread Area-West Wall	23 ft.	2	101B	Tornado Only	
Cable Spread Area-West Wall	23 ft.	1	104A	Tornado Only	
Cable Spread Area-West Wall	23 ft.	1	104B	Tornado Only	
South Stair-West Wall	23 ft.	-	102	Tornado Only	
North Stair-West Wall	23 ft.	-	103	Tornado Only	
Cable Spread Area-East Wall	23 ft.	1	105	Tornado Only	
Cable Spread Area-East Wall	23 ft.	2	106	Tornado Only	
South Cable Access Way	23 ft.	-	107	Tornado Only	
North Cable Access Way	23 ft.	-	111	Tornado Only	
South Stair-West Wall	45 ft.	-	201	Tornado Only	
North Stair-West Wall	45 ft.	-	202	Tornado Only	
Control Room East Entrance	49 ft.	-	203		
South Cable Access Way	49 ft.	-	205		

Severe Weather Doors

AOG Bldg Description	Elev.	Unit	Door No.	Remarks	Initial
Northeast Exterior	22 ft.	-	101		
Northeast Interior	22 ft.	-	102	Tornado Only	
East Interior	21 ft.	-	114	Flood Only	
West Interior	21 ft.	-	112	Flood Only	
Northwest Exterior	22 ft.	-	104		
Northwest Interior	22 ft.	-	103	Tornado Only	
Northwest	37 ft.	-	201		
Southwest Exterior	20 ft.	-	106		
Southwest Interior	22 ft.	-	105	Tornado Only	
Southeast Exterior	20 ft.	-	107		
Southeast Interior	22 ft.	-	108	Tornado Only	
CAD Room	49 ft.	-	301		
CAD Room East Floor Plate	49 ft.	-	302	Tornado Only	
CAD Room West Floor Plate	49 ft.	-	303	Tornado Only	

DG Bldg Description	Elev.	Unit	Door No.		
South Stairs	20 ft.	-	101		
South Interior	23 ft.	-	103		
Roll Up, Exterior	23 ft.	-	126		
Roll Up, Interior	23 ft.	-	104		
North Stairs	20 ft.	-	114		
North Interior	23 ft.	-	113		
4 Day Tank Room, South	23 ft.	-	124		
4 Day Tank Room, North	23 ft.	-	119		

Severe Weather Doors

Radwaste Bldg Description	Elev.	Unit	Door No.	Remarks	Initial
Loading Dock	23 ft.	-	106		
South Pipe Tunnel	-3 ft.	-	013	Flood Only	
North Pipe Tunnel	-3 ft.	-	013	Flood Only	

Service Water Bldg Description	Elev.	Unit	Door No.	Remarks	Initial
North Entrance	23 ft.	-	2		
South Entrance	23 ft.	-	1		

Date/Time Completed _____/_____

	Name (Print)	Initials
Performed by	_____	_____
	_____	_____
	_____	_____
	_____	_____
Reviewed by	_____	_____
	Unit CRS/SRO	Date
	_____	_____
	Shift Manager	Date

Earthquake Acceleration Determination

Note:	When completed, this attachment shall be retained as a QA record
Note:	3 Keys are required for the Seismic System Monitor (located in the Control Room key locker)

Initials

1. **IF** *SEISMIC EVENT* Annunciator UA-28 6-4 has alarmed, **THEN DOCUMENT** by circling the following indications at Seismic Monitoring Panel *2-ENV-XU-823* LCD color display:

   a. *Event Alarm* indicator color is RED/GREEN _____

   b. *OBE Exceedance* indicator color is RED/GREEN _____

   c. R+89 recorder status bar color is PINK/GREEN _____

   d. R-17 recorder status bar color is PINK/GREEN _____

2. **IF** *SEISMIC EVENT* Annunciator UA-28 6-4 has alarmed, **THEN DOCUMENT** by circling the following indications at Seismic Monitoring Panel *2-ENV-XU-823* Alarm and Interconnect Panel:

   a. Recorder No. 1 RED alarm light is Lit/Not Lit _____

   b. Recorder No. 2 RED alarm light is Lit/Not Lit _____

   c. *OBE* AMBER alarm light is Lit/Not Lit _____

   d. *Event* RED alarm light is Lit/Not Lit _____

3. **IF** *SEISMIC EVENT* Annunciator UA-28 6-4 has alarmed, **THEN DOCUMENT** by circling the following indications at Seismic Monitoring Panel *2-ENV-XU-823* Recorder Panel:

   a. Recorder No. 1 *Event* RED light is Lit/Not Lit _____

   b. Recorder No. 1 *Alarm* RED light is Lit/Not Lit _____

   c. Recorder No. 2 *Event* RED light is Lit/Not Lit _____

   e. Recorder No. 2 *Alarm* RED light is Lit/Not Lit _____

4. **PROVIDE** the results of Steps 1, 2, & 3 to the Unit CRS. _____

5. **CONFIRM** a Seismic Event Report has printed to the local printer located at Unit 2 Seismic Monitor *2-ENV-XU-823*, **AND RETRIEVE** the printout for analysis. _____

6. **IF** the Seismic Event Report failed to print, **THEN OBTAIN** assistance from maintenance to obtain the report. _____

Earthquake Acceleration Determination

NOTE:	The terminology of Tech and Technician in the following steps does not mean that a Technician needs to perform the steps. These are stock password security level log in functions that are part of the seismic system operating program for Operations personnel to gain access to commands to clear the system alarm indicators.

7. At the Seismic Monitoring Panel 2-ENV-XU-823, **CLEAR** the alarms by performing the following: Initials

   a. Using the mouse, **CLICK** on *Login* on the LCD Display. _____

   b. **ENTER** password *"Tech"* and click on the *OK* button. _____

   c. **CONFIRM** display changes to *"Logout Technician".* _____

   d. **IF** *OBE Exceedance* alarm is RED, **THEN GO** to Tools > Technician > Acknowledge Exceedance > Yes. _____

   e. **IF** *OBE Exceedance* alarm is RED, **THEN GO** to Tools > Technician > Clear Exceedance > Yes. _____

   f. **IF** *Event Alarm* is RED, **THEN GO** to Tools > Technician > Clear Event Alarms > Yes. _____

   g. **IF** Event LED's on Recorder Panel are lit, **THEN GO** to Tools > Operator > Clear Event LED's > Yes. _____

   h. **IF** Alarm LED's on Recorder Panel are lit, **THEN GO** to Tools > Operator > Clear Recorder Alarms > Yes. _____

   i. **VERIFY** the *Event Alarm* indicator on the LCD display is GREEN. ___/___ Ind.Ver.

   j. **VERIFY** the *OBE Exceedance* indicator on the LCD display is GREEN. ___/___ Ind.Ver.

   k. **VERIFY** the horizontal bar Recorder status indicator for R+89 recorder is GREEN. ___/___ Ind.Ver.

   l. **VERIFY** the horizontal bar Recorder status indicator for R-17 recorder is GREEN. ___/___ Ind.Ver.

   m. **VERIFY** Alarm and Interconnect Panel *OBE* amber LED is OFF. ___/___ Ind.Ver.

   n. **VERIFY** Alarm Interconnect Panel's RED Alarm LED's (2) are OFF. ___/___ Ind.Ver.

   o. **VERIFY** Alarm Interconnect Panel's RED Event LED is OFF. ___/___ Ind.Ver.

Earthquake Acceleration Determination

		Initials
p.	**VERIFY** Alarm and Interconnect Panel *AC Loss* RED LED is OFF.	___/___ Ind.Ver.
q.	**VERIFY** Alarm and Interconnect Panel *DC Power* GREEN LED is ON.	___/___ Ind.Ver.
r.	**VERIFY** Recorder Panel *Event* RED LED's (2) are OFF.	___/___ Ind.Ver.
s.	**VERIFY** Recorder Panel *Alarm* RED LED's (2) are OFF.	___/___ Ind.Ver.
t.	**VERIFY** Recorder Panel *Run* AMBER LED's (2) are ON.	___/___ Ind.Ver.
u.	**VERIFY** Recorder Panel *Charge* GREEN LED's (2) are ON.	___/___ Ind.Ver.
v.	Using the mouse, **CLICK** on *Logout Technician* on the LCD Display and **CONFIRM** the display changes to *Login*.	_____
8.	**ATTACH** a copy of the Seismic Event Report to this completed Attachment 4.	_____

Comments:_____

_____

_____

Date/Time Completed _____/_____

	Name (Print)	Initials
Performed by	_____	_____
	_____	_____
	_____	_____
	_____	_____
Reviewed by	_____	_____
	Unit CRS/SRO	Date
	_____	_____
	Shift Manager	Date

Compensatory Actions For Control Room Heat Removal

NOTE:	Chlorination is out of service but has **NOT** been decommissioned.

1. **IF** onsite, **THEN ISOLATE** the chlorine tank car as a minimum **AND REMOVE** the car, if possible. ☐

2. **CONTACT** Security **AND ENSURE** security requirements are in place for opening Security Doors. ☐

3. **CONTACT** E&RC for any additional monitoring requirements are implemented. ☐

4. **REVIEW** Technical Specification 3.7.3, Control Room Emergency Ventilation (CREV) System, for any additional requirements. ☐

5. **OPEN AND SECURE** the following Elevation 49 ft. Control Room doors:

   - *WCC North entrance door* ☐
   - *2-CTB-DR-EL049-203* ☐
   - *2-CTB-DR-EL049-204.* ☐

6. **IF** necessary to increase flow, **OPEN AND SECURE** the following Elevation 49 ft. Control Room doors:

   - *2-CTB-DR-EL049-201* ☐
   - *1-CTB-DR-EL049-202* ☐
   - *2-CTB-DR-EL049-208* ☐
   - *1-CTB-DR-EL049-215* ☐

Compensatory Actions For Control Room Heat Removal

7. **OPEN AND SECURE** the following Elevation 70 ft. Control Building Mechanical Equipment Room doors:

   - *2-CTB-DR-EL070-302A* ☐
   - *2-CTB-DR-EL070-302B* ☐
   - *2-CTB-DR-EL070-303* ☐
   - *2-CTB-DR-EL070-304A* ☐
   - *2-CTB-DR-EL070-308B.* ☐

8. **REMOVE** insulation covers from the access doors located directly above the following dampers:

   - *1-VA-ISOL-DMP-CB* ☐
   - *2-VA-ISOL-DMP-CB.* ☐

CAUTION

The access door must be opened prior to closing damper. A rush of air will be directed directly at the Operator when the door is opened.

9. **OPEN** the following damper access doors:

   - *1-VA-ISOL-DMP-CB* ☐
   - *2-VA-ISOL-DMP-CB.* ☐

10. **CLOSE** the following dampers by turning the crank mechanism located on the side of each damper:

    - *1-VA-ISOL-DMP-CB* ☐
    - *2-VA-ISOL-DMP-CB.* ☐

Compensatory Actions For Control Room Heat Removal

RESTORATION

NOTE:	When completed, this attachment shall be retained as a QA record.

Initials

1. **OPEN** the following dampers by turning the crank mechanism located on the side of each damper:

   - *1-VA-ISOL-DMP-CB* ___/___ Ind.Ver.
   - *2-VA-ISOL-DMP-CB.* ___/___ Ind.Ver.

2. **CLOSE** the following damper access doors:

   - *1-VA-ISOL-DMP-CB* ___/___ Ind.Ver.
   - *2-VA-ISOL-DMP-CB.* ___/___ Ind.Ver.

3. **INSTALL** insulation covers from the access doors located directly above the following dampers:

   - *1-VA-ISOL-DMP-CB* ___/___ Ind.Ver.
   - *2-VA-ISOL-DMP-CB.* ___/___ Ind.Ver.

4. **ENSURE** the following Elevation 49 ft. Control Room doors are closed:

   - *2-CTB-DR-EL049-201* ___/___ Ind.Ver.
   - *1-CTB-DR-EL049-202* ___/___ Ind.Ver.
   - *2-CTB-DR-EL049-208* ___/___ Ind.Ver.
   - *1-CTB-DR-EL049-215* ___/___ Ind.Ver.
   - *2-CTB-DR-EL049-203* ___/___ Ind.Ver.
   - *2-CTB-DR-EL049-204.* ___/___ Ind.Ver.

Compensatory Actions For Control Room Heat Removal

RESTORATION

Initials

5. **ENSURE** the following Elevation 70 ft. Control Building Mechanical Equipment Room doors are closed:

- *2-CTB-DR-EL070-302A* ___/___ Ind.Ver.
- *2-CTB-DR-EL070-302B* ___/___ Ind.Ver.
- *2-CTB-DR-EL070-303* ___/___ Ind.Ver.
- *2-CTB-DR-EL070-304A* ___/___ Ind.Ver.
- *2-CTB-DR-EL070-308B.* ___/___ Ind.Ver.

Comments:_____

_____

_____

_____

Date/Time Completed _____/_____

	Name (Print)	Initials
Performed by	_____	_____
	_____	_____
	_____	_____
	_____	_____
Reviewed by	_____	_____
	Unit CRS/SRO	Date
	_____	_____
	Shift Manager	Date

REVISION SUMMARY

Revision 49 makes editorial changes to correct issues found during the Biennial Review. These include misspellings, typos, incorrectly bolded words, incorrect bulleting, and incorrect tabulation (PRR 00435445).

Revision 48 is an editorial change in the earthquake section that relocates the step to shutdown the plant to an earlier location allowing for a more timely implementation of the EAL.

Revision 47 revises Step 3.2.4.1.g to have Chemistry sample the fish flume and secure sodium hypochlorite if needed and added a note stating chlorination has not been decommissioned per PRR 252966, added 0OI-01.01 to references and changed LCO references to 0OI-01.01 per PRR 368951, corrected spelling in Step 5 of Attachment 4 per PRR 412724, and made Attachment 5, Step 1 conditional based on the chlorine tank car being onsite and added a note stating chlorination has not been decommissioned per PRR 398928.

Revision 46 incorporates EC 74734 which decommissions the Unit1 seismic monitor. This revision also incorporates operator comments from training on EC 74733. These comments enhance Attachment 4.

Revision 45 incorporates EC 74733 (55350 master) which upgrades the Unit 2 seismic monitoring system utilizing a new Kinemetrics Condor Seismic Monitoring System. This revision also moves the step for contacting the National Earthquake Center earlier in the procedure and updates shift titles for Shift Manager and Unit CRS/SRO.

Revision 44 adds actions to take at the new Independent Spent Fuel Storage Installation (ISFSI) in the event of a tornado, hurricane, earthquake or flood. (EC 67583; AR 388009).

Revision 43 removes the compensatory steps added in revision 38 which blocked open DG building doors if a tornado warning or watch is issued. The issues in AR 259088 have been addressed allowing removal of these compensatory steps.

Revision 42 addresses AR 277555 by removing all reference of the SDCB temporary diesel pump.

Revision 41 provides more detail and flexibility for addressing reactor building 117 crane operation during Tornado watches/warnings.

Revision 40 incorporates EC 62827 which places Unit 2 TB Ventilation in Recirc alignment for tornado and hurricane warnings.

Revision 39: Revised first NOTE on page three to allow flexibility in how to secure doors open as requested by Operations.