CP&L

Carolina Power & Light Company
Harris Nuclear Plant
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APR 14 2000

SERIAL: HNP-00-064
10 CFR 50, Appendix E

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
EMERGENCY ACTION LEVEL REVISION 00-1

Dear Sir or Madam:

In accordance with 10 CFR 50, Appendix E, Carolina Power & Light Company (CP&L) is submitting the Harris Nuclear Plant Emergency Action Level (EAL) Revision 00-1 for your review and approval. These emergency action levels have been discussed and agreed upon by CP&L, the State of North Carolina and local governmental authorities as required by 10 CFR 50, Appendix E, IV.B. Two (2) full size copies of the EAL Flow Path (side 1 and side 2) are included with this letter.

Enclosure 1 to this letter provides a comparison of the currently approved EALs and the proposed revision 00-1. Enclosure 1 also provides a summary of the 10 CFR 50.54(q) evaluation performed by CP&L, including the basis for the determination that the changes do not decrease the effectiveness of the Emergency Plan.

The Harris Nuclear Plant Emergency Action Levels Comparison with NUREG-0654 Attachment 2 document has been revised (Rev. 00-1) and is provided as Enclosure 2 to this letter.

It is CP&L's intent to implement the EAL Revision 00-1 following receipt of NRC approval. CP&L currently plans to be prepared to implement the EALs prior to June 2000 (the start of the Atlantic Hurricane Season). Therefore, CP&L requests the NRC's review of these EALs in support of this schedule.

Questions regarding this matter may be referred to Mr. J. H. Eads at (919) 362-2646.

Sincerely,

D. B. Alexander

D. B. Alexander
Manager, Regulatory Affairs
Harris Nuclear Plant

MGW

Enclosures

A045

c: Mr. J. B. Brady (NRC Senior Resident Inspector, HNP)
Mr. Rich Laufer (NRR Project Manager, HNP)
Mr. L. A. Reyes (NRC Regional Administrator, Region II)

HNP Emergency Action Level Flow Path Rev. 00-1 (Natural Phenomenon EAL change)

Scope of Changes:

This EAL Revision is being submitted to the NRC to obtain approval, as required by 10CFR50, Appendix E, Section IV.B, prior to implementation. Implementation will be accomplished through incorporation into a revision to PLP-201 and PEP-110 following receipt of NRC review and approval.

Revision 00-1 to the HNP Emergency Action Level (EAL) classification scheme incorporates a criteria for the plant to be above cold shutdown for escalation of "Severe Natural Phenomenon" to a Site Area Emergency level. The "not in cold shutdown" criteria is an element of the associated NUREG-0654 example Initiating Conditions, the equivalent EALs at several other plants and should be included in the HNP EAL scheme.

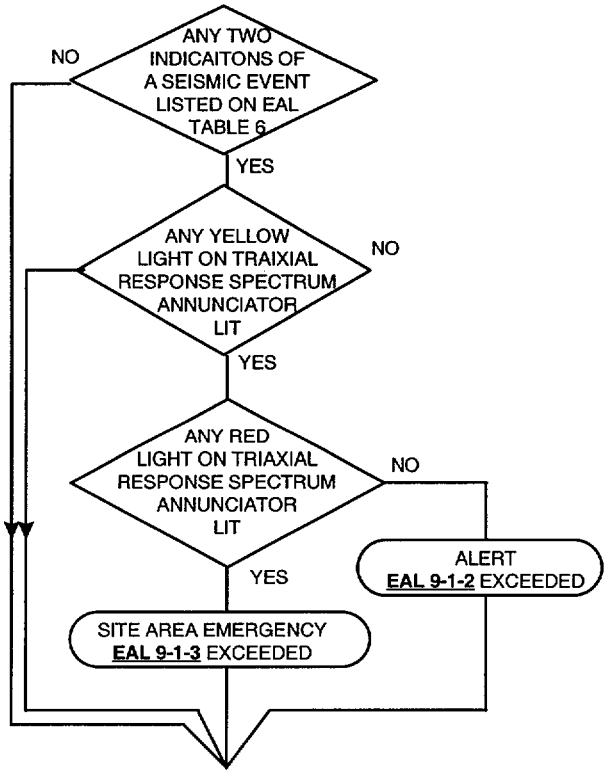
The threshold values for severe wind velocities have been increased to achieve consistency with the event classification level definitions, plant design, meteorological forecast expectations and consideration of the impact of excessively conservative event declarations on off-site resources during severe natural phenomenon events.

Tornado related assessments have been updated to better reflect observable and measurable criteria.

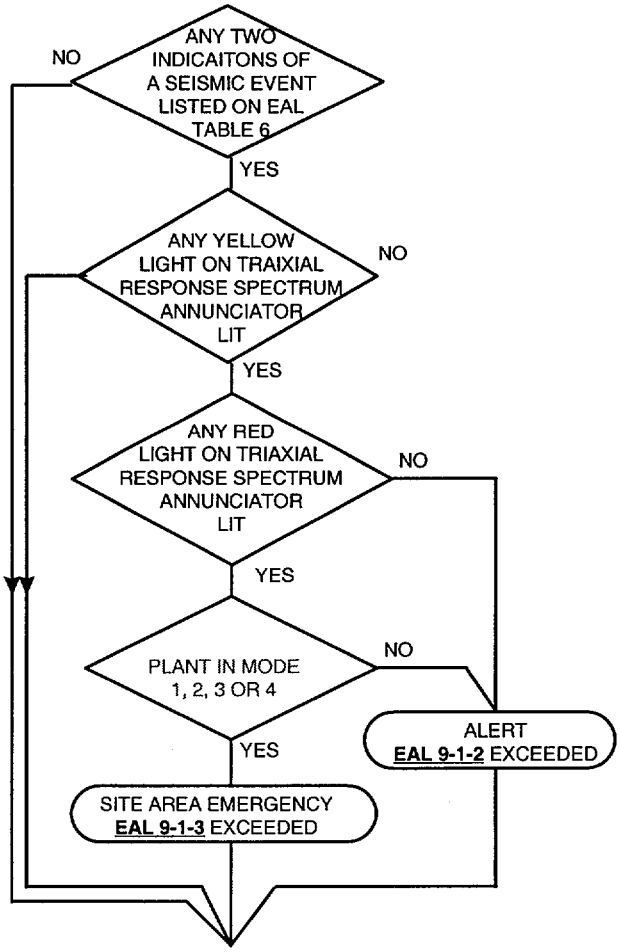
Also, two of the Unusual Event conditions within Category 9 "Natural Phenomena" were renumbered to achieve consistency in the numbering of Hurricane and Tornado related events.

Change Comparison for EALs 9-1-2 and 9-1-3 (Seismic Events):

Rev. 99-1:



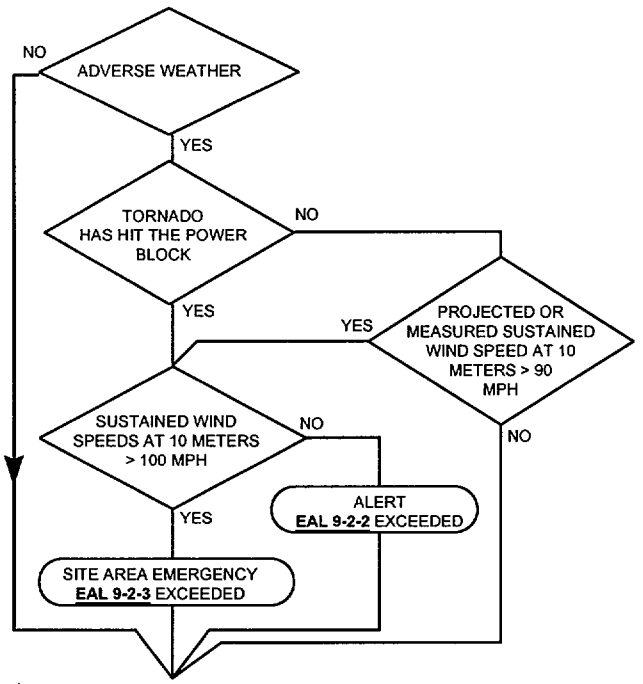
Rev 00-1:



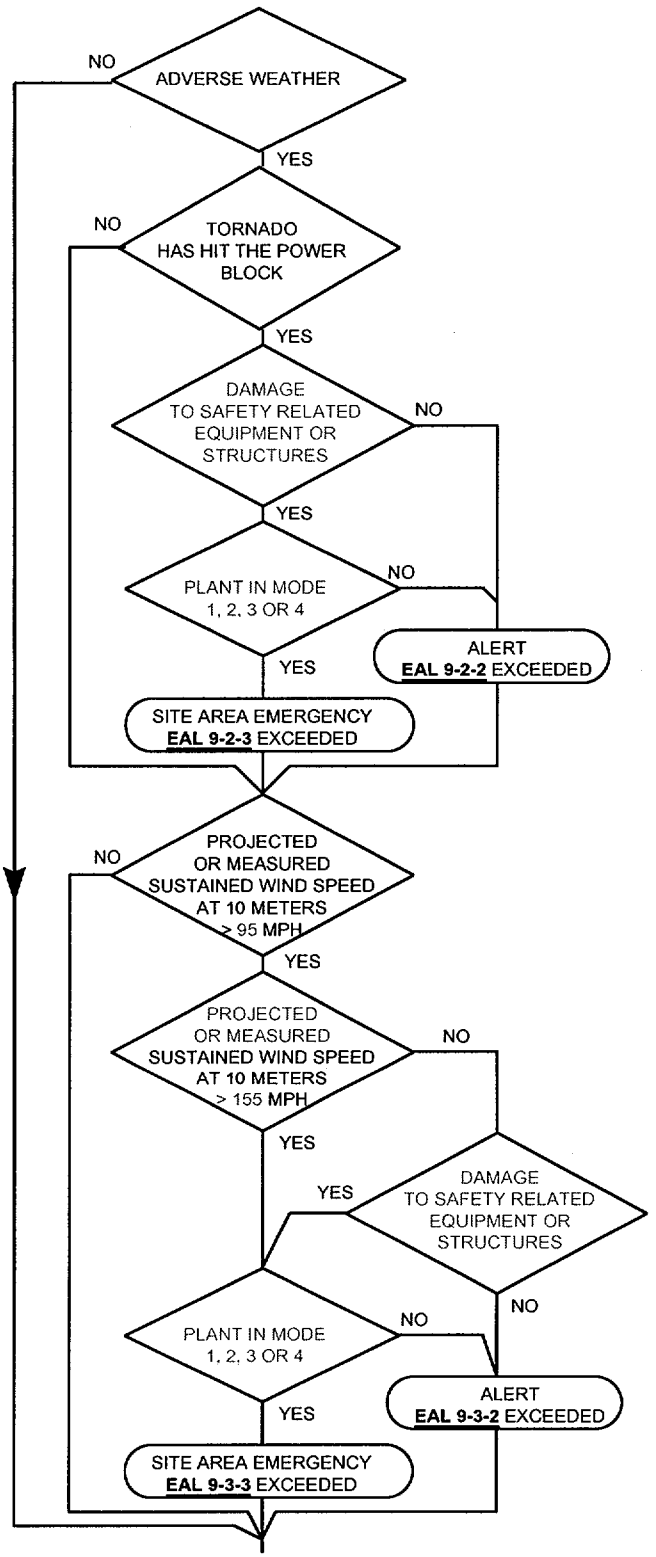
HNP Emergency Action Level Flow Path Rev. 00-1 (Natural Phenomenon EAL change)

Change Comparison for Adverse Weather EALs (9-2-1/2/3 and 9-3-1/2/3):

Rev. 99-1:



Rev 00-1:



EAL 9-2-1 SUSTAINED WIND SPEED AT 10 METERS OF 74 MPH OR GREATER

EAL 9-3-1 TORNADO REPORTED WITHIN THE EAB

EAL 9-2-1 TORNADO REPORTED WITHIN THE EAB

EAL 9-3-1 SUSTAINED WIND SPEED AT 10 METERS OF 74 MPH OR GREATER

HNP Emergency Action Level Flow Path Rev. 00-1 (Natural Phenomenon EAL change)

Change Assessment - EAL 9-1-3 Site Area Emergency associated with a seismic event:

The addition of a plant in Mode 1-4 requirement prior to escalating to a Site Area Emergency makes the HNP EALs consistent with NUREG-0654/FEMA-REP-1[1] and would result in escalation to a Site Area Emergency only for those events which meet the Class Description [2] and Purpose [2] of this classification level.

Change Assessment - EAL 9-2-3 Site Area Emergency associated with a tornado

1. The addition of a plant in Mode 1-4 requirement prior to escalating to a Site Area Emergency is consistent with NUREG-0654/FEMA-REP-1[3].
2. The previous use of a >100 MPH sustained wind speeds criteria for escalation has been replaced by assessment of any damage occurring as a result of the tornado. The intent of both the previous and current assessments is to determine if the event exceeds design levels. The change in criteria is appropriate based on:
   - HNP's tornado loading design [4] (in the Fujita scale F5 range, refer to next page) is nearly three (3) times the maximum measurable velocity (approx. 100 MPH) of the HNP Anemometer.
   - Plant meteorological tower location (approx. 1.1 miles northeast of the Protected Area) would be of limited value in evaluating wind conditions in the area around a tornado impacting the Protected Area.
   - Evaluating for damage to equipment and systems (designed to not be damaged by a tornado) provides a more accurate indication of an event which is "in excess of design limits."
3. The decision blocks were rearranged with hurricane and tornado related assessments being separated for clarity and to ensure proper human factors considerations with incorporation of the above modifications.
4. The effect of the changes are to better assure that escalation to a Site Area Emergency occurs only for those events which meet the Class Description and Purpose of this classification level.

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[1] NUREG-0654 EXAMPLE INITIATING CONDITIONS: SITE AREA EMERGENCY,

15. Severe natural phenomena being experienced or projected with plant **not in cold shutdown.**

Item a. Earthquake greater than SSE levels

[2] **SITE AREA EMERGENCY:**

Class Description:

Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases not expected to exceed EPA Protective Action Guideline exposure levels except near site boundary.

Purpose:

Purpose of the site area emergency declaration is to (1) assure that response centers are manned, (2) assure that monitoring teams are dispatched, (3) assure that personnel required for evacuation of near-site areas are at duty stations if situation becomes more serious, (4) provide consultation with offsite authorities, and (5) provide updates for the public through offsite authorities.

[3] NUREG-0654 EXAMPLE INITIATING CONDITIONS: SITE AREA EMERGENCY,

15. Severe natural phenomena being experienced or projected with plant **not in cold shutdown.**

Item c. Sustained winds or tornadoes in excess of design levels

HNP Emergency Action Level Flow Path Rev. 00-1 (Natural Phenomenon EAL change)

Change Assessment - EAL 9-2-3 Site Area Emergency associated with a tornado

Tornadoes are classified by wind speed and damage according to the Fujita Scale

F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage Done
F0	Light (or Gale) tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Considerable (or Significant) tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	**Incredible tornado**	**261-318 mph**	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; (normal) steel re-enforced concrete structures badly damaged.
F6	Inconceivable tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

Change Assessment - EAL 9-2-2 Alert associated with a tornado

1. The criteria for declaration of an Alert for a Tornado hitting the power block is essentially unchanged in this revision.

   NOTE: Any Tornado hitting the power block would result in at least an Alert declaration. An upgrade to a Site Area Emergency would occur for indications of a tornado greater than design levels with the plant above cold shutdown. If either of these conditions is not valid the classification would remain as an Alert.

2. The decision blocks were rearranged with hurricane and tornado related assessments being separated for clarity and to ensure proper human factors considerations with incorporation of the above modifications.

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[4] Per HNP FSAR 3.3.2, TORNADO LOADING, section 3.3.2:.
Parameters applicable to the design basis tornado are in accordance with Regulatory Guide 1.76 and are as follows:

a) External wind forces resulting from a tornado funnel with a horizontal rotational velocity of **290** mph and a horizontal translational velocity of 70 mph.
b) A radius of maximum rotational velocity of 150 feet.

HNP Emergency Action Level Flow Path Rev. 00-1 (Natural Phenomenon EAL change)

Change Assessment - EAL 9-3-3 Site Area Emergency associated with hurricane force winds

1. The addition of a plant in Mode 1-4 requirement prior to escalating to a Site Area Emergency is consistent with NUREG-0654/FEMA-REP-1 [5].
2. The change of the threshold 10 meter wind velocity from 100 MPH to 155 MPH remains conservative with regard to the NUREG-0654/FEMA-REP-1 basis (179 MPH [6]) for this EAL and provides for enhanced ability to predict and monitor the threshold for this condition [7].
3. An additional criteria for escalation to a Site Area Emergency has been added for conditions not meeting the wind speed threshold, but still resulted in damage to safety related equipment or structures. Presence of this damage would be indicative of weather effects which "exceeded design levels." This addition provides for consistency in assessment of EALs associated with high sustained winds (hurricane force) and tornado effects on the plant.
4. The decision blocks were rearranged with hurricane and tornado related assessments being separated for clarity and to ensure proper human factors considerations with incorporation of the above modifications.

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[5] NUREG-0654 EXAMPLE INITIATING CONDITIONS: SITE AREA EMERGENCY,

15. Severe natural phenomena being experienced or projected with plant **not in cold shutdown.**
Item c. Sustained winds or tornadoes in excess of design levels.

[6] PER SHNPP FSAR 3.3, WIND AND TORNADO LOADINGS

As outlined in General Design Criterion (GDC) 2, "Design Basis for Protection Against Natural Phenomena", of Appendix A to 10CFR50, structures, systems, and components important to safety are designed to withstand the effects of natural phenomena, such as tornadoes or hurricanes without loss of capability to perform their safety functions.

3.3.1.1 Design Wind Velocity

The plant Seismic Category I structures are designed to withstand the effects of the design wind, a maximum wind of **179 mph** at 30 feet above plant grade. The design wind is based on a 1000-year return period " fastest mile of wind." Standard Review Plan 3.3.1 requires that the design wind velocity be based on a 100-year return period "fastest mile of wind," which for SHNPP is 117 mph at 30 ft. above plant grade. Since the design wind is based on the 1000-year return period, SHNPP design is conservative.

[7] The previous 100 MPH trigger point was established at the plant's installed anemometer maximum design speed. This threshold was significantly less than (56% of) the plant design wind and provided very little discrimination between the Alert and SAE wind speed thresholds. The 155 MPH threshold is associated with the "Saffir-Simpson Hurricane Scale" Category 5 threshold (see next page). Use of the Saffir-Simpson Hurricane Scale threshold value allows for more consistent review and comparison of various weather related forecast data sources currently available, such as the contracted weather service (Murray and Trettle) or the National Weather Service (NWS). Also, there is a proliferation of other weather monitoring and prediction sources (Doppler/NEXRAD radar, Internet and Satellite broadcast of information from sources such as the Weather Channel, NOAA, and local TV/Radio stations. This vast array of weather related data sources (available from contracted, agreement, and other public sources) provides adequate capability to be able to identify this revised EAL criteria.

"Saffir-Simpson Hurricane Scale"

All Hurricanes are dangerous, but some are more so than others. The way storm surge, wind and other factors combine determines the hurricanes destructive power. To make comparisons easier and to make the predicted hazards of approaching hurricanes clearer to emergency forces, National Oceanic and Atmospheric Administration's hurricane forecasters use a disaster-potential scale which assigns storms to five categories. This can be used to give an estimate of the potential property damage and flooding expected along the coast with a hurricane.

Category	Definition	Effects
One	Winds 74-95 mph	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal road flooding and minor pier damage
Two	Winds 96-110 mph	Some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of center. Small craft in unprotected anchorages break moorings.
Three	Winds 111-130 mph	Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris. Terrain continuously lower than 5 feet ASL may be flooded inland 8 miles or more.
Four	Winds 131-155 mph	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach. Major damage to lower floors of structures near the shore. Terrain continuously lower than 10 feet ASL may be flooded requiring massive evacuation of residential areas inland as far as 6 miles.
Five	**Winds greater than 155 mph**	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Major damage to lower floors of all structures located less than 15 feet ASL and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5 to 10 miles of the shoreline may be required.

HNP Emergency Action Level Flow Path Rev. 00-1 (Natural Phenomenon EAL change)

Change Assessment - EAL 9-3-2 Alert associated with hurricane force winds

1. The change of the threshold 10 meter wind velocity from >90 MPH to >95 MPH remains conservative with regard to the NUREG-0654/FEMA-REP-1[8] basis (179 MPH [9]) for this EAL and provides for enhanced ability to predict and monitor the threshold for this condition [10].
2. The decision blocks were rearranged with hurricane and tornado related assessments being separated for clarity and to ensure proper human factors considerations with incorporation of the above modifications.

Change Assessment - EALS 9-2-1 AND 9-3-1

Both Unusual Event EAL conditions remain unchanged. The two EAL numbers were swapped to achieve consistency (within the second digit of the numbering scheme) with the Alert and Site Area Emergency EAL numbers for Tornado and Hurricane related events. This provides enhanced human factors with the addition of EAL numbers 9-3-2 and 9-3-3 (Hurricane related wind speeds were in the same EAL condition as Tornado events in the previous revision).

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[8] NUREG-0654 EXAMPLE INITIATING CONDITIONS: ALERT

17. Severe natural phenomena being experienced or projected
    item c. Hurricane winds near design basis level

[9] PER SHNPP FSAR 3.3, WIND AND TORNADO LOADINGS

As outlined in General Design Criterion (GDC) 2, "Design Basis for Protection Against Natural Phenomena", of Appendix A to 10CFR50, structures, systems, and components important to safety are designed to withstand the effects of natural phenomena, such as tornadoes or hurricanes without loss of capability to perform their safety functions.

3.3.1.1 Design Wind Velocity

The plant Seismic Category I structures are designed to withstand the effects of the design wind, a maximum wind of **179 mph** at 30 feet above plant grade. The design wind is based on a 1000-year return period " fastest mile of wind." Standard Review Plan 3.3.1 requires that the design wind velocity be based on a 100-year return period "fastest mile of wind," which for SHNPP is 117 mph at 30 ft. above plant grade. Since the design wind is based on the 1000-year return period, SHNPP design is conservative.

[10] The previous 90 MPH trigger point and the proposed 95 MPH trigger are within the plant's installed anemometer capabilities. The new threshold remains significantly conservative with respect to the plant design wind. The new >95 MPH threshold is associated with the "Saffir-Simpson Hurricane Scale" Category 2 threshold (see previous page). Use of the Saffir-Simpson Hurricane Scale threshold value allows for more consistent review and comparison of various weather related forecast data sources currently available.

NUREG-0654, Attachment 2, Example Initiating Conditions Cross Reference to HNP Emergency Action Levels, Rev. 00-1

This revision includes EAL changes associated with:

1. **Incorporating a criteria for the plant to be above cold shutdown for escalation of "Severe Natural Phenomenon" to a Site Area Emergency level.**
2. **The threshold values for severe wind velocities have been increased.**
3. **Tornado related assessments have been updated to better reflect observable and measurable criteria**

NOTES:

1. Tornado and Hurricane related Unusual Event EAL numbers (Category 9) have been swapped to achieve consistency with above EAL changes and resulting numbering of the higher level EALs.
2. Affected sections & text are indicated with a rev. bar in the right margin

Table of Contents

I. PREFACE

The philosophy applied, directed by NUREG-0654, while building the HNP Emergency Action Level Flowpath is that the classification of emergencies should be anticipatory to allow early notification for events that could escalate into major specific events and major releases.

In many cases the NUREG-0654 recommendation was based upon the actual or predicted loss of one or more of the Fission Product Barriers. Instead of attempting to develop a group of procedures that would address the specifics recommended in NUREG-0654, HNP took the approach that the loss of a Fission Product Barrier should be analyzed. Action should be taken based upon the number of Barriers that have been breached or are in jeopardy of being breached.

In order to accomplish this task, the plant had to determine what indications would show that any single Fission Product Barrier had been breached or potentially could be breached (is in jeopardy). This task was accomplished and resulted in the development of the first column of Side 1 of the EAL Flowpath.

The Site Emergency Coordinator can quickly assess the status of the three Fission Product Barriers by answering the questions listed on the flowchart. In this manner, if the Fission Product Barriers are breached or in jeopardy (potential for breach is present), the event can be quickly escalated to the correct classification.

Once all of the Fission Product Barriers are examined, the Flowpath is completed to determine if any other reason exists that would require the classification of an Emergency Action Level (EAL). In using this method, we handle the major emergencies, followed by other types of emergencies which could become major emergencies.

The average SRO licensed individual is expected to take less than 15 minutes to go through the entire Flowpath and determine that an Emergency Classification is, or is not, warranted. In the case of an Unusual Event, Alert, or Site Area Emergency condition, the time delay is acceptable. If conditions are quickly deteriorating, a faster method of classification is needed.

Because of this, the Site Emergency Coordinator is directed on the Flowpath to declare a General Emergency as soon as it is determined to exist. The declaration of a Site Area Emergency, Alert, or an Unusual Event may be slightly delayed, as necessary, to finish the Flowpath and to find out if a higher level classification exists.

The Flowpath is designed to look at the worst case events first, then the other events in descending order of importance. Some consideration was given to the layout of the path, so some of the potential events were moved together to group related conditions in order to make the path flow in a more logical fashion. The EAL Flowpath follows the same rules and conventions that the EOP (Emergency Operating Procedure) Flowpaths follow. This is an aid to the users in that they do not have to learn two conventions.

I. PREFACE (continued)

Entry Point X provides a generic starting point for evaluating the Emergency Action Levels. Entry into Abnormal Operating Procedures or Emergency Operating Procedures provides direction to initiate monitoring of the EALs from this entry point to determine if the off normal situation warrants declaration of an emergency.

The NRC Emergency Preparedness Position (EPPOS) on Acceptable Deviations to Appendix 1 to NUREG-0654/FEMA-REP-1 (EPPOS No.1) has been applied to the Emergency Action Levels to provide clarification , or improvements, to the EALs and Initiating Conditions.

The HNP EALs have had reference numbers assigned. These are in the format (X-Y-Z) where X = Category (1 - 11), Y = Identifier Within Category, and Z = Classification (1-4). The Classification numbers are 1 = Unusual Event, 2 = Alert, 3 = Site Area Emergency, and 4 = General Emergency. These EAL reference numbers aid in communication of events between facilities and are linked to an EAL Reference Manual provided to offsite authorities which aids them in understanding the event, in layman's terms with graphical representations as applicable.

II. FISSION PRODUCT BARRIER ANALYSIS

A. General

Each of the Fission Product Barriers is analyzed to determine if it is breached or in jeopardy. The first indication of either event results in declaring the specific barrier to be either breached or jeopardized. From an EAL declaration standpoint, it does not matter whether the barrier is breached or in jeopardy. However, it effects actions executed by other plant documents; therefore, the breach indicators are examined before the jeopardy indicators.

The assessment of plant conditions, performed as a part of plant operators progressing through the Emergency Operating Procedure (EOP) Network, identifies indications that would prove one or more of the Fission Product Barriers to be breached. The plant staff has analyzed the EOP Network to determine those points at which any one (or more) of the barriers indicates a breach. These points are identified in the EAL Flowpath as entry points T, U, and V. If a Fuel breach is indicated in the EOP Network, the EOP Network orders the operators to enter the EAL Flowpath at ENTRY POINT T. The same process is used for entry points U (RCS breached) and V (Containment breached).

II.A. FISSION PRODUCT BARRIER ANALYSIS, General (continued)

EOP network references to EAL Flowpath Entry Points T, U, and V include the following conditions:

- Containment Hydrogen (H_2) concentration $\geq$ 4% results in Entry Points T and V for Fuel and Containment breach. Four percent H_2 is indicative of zirconium water reaction associated with inadequate core cooling and fuel damage. The Containment is classified as breached with H_2 in Containment being at the flammability threshold. This classification occurs well below the explosive limit of 18.2%.

- Procedure steps that have identified a Steam Generator Tube Rupture reference EAL Entry Point U, for a breach of the Reactor Coolant System fission product barrier.

- If the procedures identify an increase in Reactor Auxiliary Building radiation levels, or a loss of primary coolant outside Containment, then EAL Entry Point V is also referenced for a loss of the Containment fission product barrier.

- Functional Restoration Procedures that direct the operations staff to vent the Reactor Coolant System (RCS) to Containment, or to otherwise initiate a bleed path from the RCS to Containment refer to EAL Entry Point U for a breach of the RCS fission product barrier.

These entry points serve two purposes:

1. They force a reentry into the EAL Flowpath in case the Emergency Action Level may need to be upgraded.

2. Since the entry point, as determined by the EOP's, has already determined that one of the Fission Product Barriers is breached, it reduces the time necessary to arrive at the correct Emergency Classification.

The assessment of the three fission product barriers is performed using the first column of Side 1 of the EAL flow path. The decision blocks used to evaluate the fission product barriers are grouped together such that the Fuel, then Reactor Coolant System, and lastly the Containment are evaluated.

Some parameters or conditions are indicative of a breach of more than one barrier. In these cases, two or all three barriers affected are indicated in the action block following the applicable response from the flow path decision block.

The parameters used to evaluate the barriers, and the bases for utilizing these parameters are described in the following three sections (B through D).

II.B. FISSION PRODUCT BARRIER ANALYSIS, FUEL

1. ANY RAD MONITOR EAL TABLE 1 IN HIGH ALARM? - If none of the Rad monitors are in alarm, the next 3 decision blocks can be bypassed which minimizes the time needed to go through the Flowpath.

2. PLANT VENT STACK #1 WRGM EFFL CHNL >3.6 E5 µCi/sec? - This is an indication that all 3 FPBs are breached. The stack effluent monitor would exceed this level if the Containment airborne concentration of radioactivity was due to an RCS activity of 300 µCi/cc (I-131) with a 50 gpm RCS leak. Containment is assumed breached via the purge system running at 1500 CFM with no credit taken for cleanup systems. This includes the dilution effects that are predicted to occur during the release through the Plant Vent Stack release path.

3. EITHER CNMT HI RANGE ACCIDENT MON >17.5 R/HR? - The CNMT monitors would not indicate this level of radiation unless a fuel breach and an RCS breach had occurred. This radiation level is based upon 300 µCi/cc RCS activity (I-131) (Alert level) and 40 gpm leakage from the RCS to Containment in addition to the 10 gpm allowable by Technical Specifications.

4. ANY EAL TABLE 2 MONITOR >1000 TIMES NORMAL? - The 1000 x normal EAL Table 2 value was taken directly from the NUREG-0654 recommendations.

5. WAS ENTRY POINT AT T? - If the entry point was at T, the fuel fission product barrier is indicating breached, based upon the EOP Network determination. The remainder of the fuel fission product barrier evaluation is bypassed.

6. GFFD INCREASED >1.0E5 CPM IN 30 MINUTES? - An increase of this magnitude indicates that the fuel fission product barrier is breached. The set point is below the NUREG-0654 "Alert" classification (based on 1% failed fuel in 30 minutes or 5% failed fuel). Only two set points were provided by Westinghouse on the Gross Failed Fuel Detector (the lower set point was used for the Unusual Event Declaration).

7. RCS ACTIVITY (I-131 DOSE EQUIVALENT) >300 µCi/cc? - The value of 300 µCi/cc (I-131) was taken directly from NUREG-0654.

8. CORE COOLING CSF RED? - A Red on this Critical Safety Function (CSF-2) would be due to either core temperatures above 1200EF or core temperatures above 730 $^{\circ}$F and RVLIS less than 39%. In either case, the fuel is in jeopardy.

II.C. FISSION PRODUCT BARRIER ANALYSIS, RCS

1. EOP PATH-2 ENTERED? - This is an indication of a SG tube rupture with safety injection (RCS initial leak rate of >120 gpm). This indicates that the RCS is breached. If EOP PATH 2 has been entered, the SG radiation monitor levels are an indication that both the fuel and the RCS barriers are breached. The limit of 20 mR/HR is based upon having 300 µCi/cc RCS activity (I-131) leaking at 40 gpm into a Steam Generator. A 40 gpm leak rate was utilized as a conservative threshold to allow for an assumed 10 gpm of RCS leakage to the Containment atmosphere (total RCS leakage therefore equal 50 gpm).

2. CNMT LEAK DET RAD MON NOBLE GAS CHNL >8.0 E-3 µCi/cc? - With normal activity in the RCS, if the Containment Leak Detection Radiation Monitor noble gas channel increases to greater than 8.0 E-3 µCi/cc, the RCS is leaking at a rate greater than 40 gpm in addition to the Tech. Spec. limit of 10 gpm. The RCS is then classified as being breached.

3. WAS ENTRY AT POINT U? - If the entry point, into the EAL Network, was at entry point U, then the EOP Flow Path has already determined that the RCS boundary is breached and the FPB status board was so indicated upon EAL entry. Time is saved by bypassing other steps which evaluate the RCS fission product barrier. Steps which evaluated more than one barrier were not bypassed.

4. RCS LEAKAGE >50 GPM? - This is an indication of an RCS breach, regardless of the activity level in the system. This was taken directly from NUREG-0654.

5. INTEGRITY CSF MAGENTA OR RED? - If the RCS Integrity Critical Safety Function (CSF-4) does not indicate green or yellow, the RCS FPB is in jeopardy. This would occur when RCS temperature is <240 °F and low temperature overpressure or cooldown limitations were exceeded. This ensures that a pressurized thermal shock event will be classified at least as an Alert.

II.D. FISSION PRODUCT BARRIER ANALYSIS, CONTAINMENT

1. WAS ENTRY AT POINT V? - The EOP Flow Path has ready determined that the CNMT FPB has been breached and was indicated so upon EAL flow path entry. Steps to evaluate the Containment FPB are bypassed.

2. IS CNMT PHASE A OR VENT ISOLATION REQUIRED? - If plant conditions are such that isolation of the containment is designed to occur, then an evaluation of the effectiveness of the isolation is performed. If a pathway from the containment exists, the FPB is declared breached. Releases from Containment through the secondary plant are evaluated separately and are not considered in this assessment.

3. BOTH FUEL AND RCS INTACT ON FPB STATUS BOARD? - If either the Fuel or RCS fission product barriers are in jeopardy or breached the status of the containment penetrations is evaluated to determine if a pathway exists. Releases from Containment through the secondary plant are evaluated separately and are not considered in this assessment.

4. PRIMARY TO SECONDARY LEAKAGE IN ANY SG >10 GPM? - In accordance with NUREG-0654 the Containment is not considered breached by stuck open SG safeties or PORVs or non-isolable secondary system breaks unless there is a release pathway caused by primary to secondary leakage in the affected SG. The example criteria of >10 gpm primary to secondary leakage for steam breaks from NUREG-0654 was applied to the related secondary plant valve problems. If leakage does not exceed this threshold, the related evaluations are bypassed.

5. AFFECTED SG SAFETY VALVES SHUT? - An open Steam Generator Safety Valve is one indication of a Main Steam break outside of Containment and with >10 gpm primary to secondary leakage the Containment is declared breached.

6. AFFECTED SG PORV SHUT? - This is normally the case following a Reactor Trip. The PORVs may open momentarily, but quickly close as the energy is dissipated. If the PORV is open, the ability to close the valve or it's block valve is evaluated. If the valve can not be shut and >10 gpm primary to secondary leakage exists, the Containment is declared breached.

7. UNISOLABLE STEAM AND/OR FEED BREAK OUTSIDE CNMT IN AFFECTED SG? - An unisolable steam and/or feed break outside of the Containment is a breach of the Containment FPB if a release pathway via primary to secondary leakage exists. A note is provided to aid in distinguishing between a minor leak, such as valve packing, and a break which could produce a significant radiological release.

II.D. FISSION PRODUCT BARRIER ANALYSIS, CONTAINMENT (continued)

8. SG PRESS >1230 PSIG? - If SG pressure is below 1230 PSIG, then the SGs are acting as a normal heat sink. Following a Reactor trip, the SG pressure rapidly increases, but remains below 1100 PSIG. If it increases above this, the PORVs and Safeties lift to restore the pressure. If the pressure cannot be maintained below 1230 PSIG, a SG tube rupture has occurred that is severe enough to challenge SG integrity. The RCS will already be considered breached because EOP PATH-2 will be entered. The SG level is then evaluated to determine if an overfill condition is occurring. A value of 82.4% was chosen as a threshold to declaring the Containment as being in jeopardy.

9. CNMT >3 PSIG? - If Containment pressure is greater than 3 psig, a LOCA greater than normal charging capacity may have occurred since this is the action point for Safety Injection. At this pressure the Containment, per design, is not breached. A jeopardy status is assigned. This question will also result in an Alert declaration for main steam or feedwater ruptures inside containment.

III. EXAMPLE INITIATING CONDITIONS

The Fission Product Barrier analysis provides a symptomatic assessment of plant conditions to address and classify events which warrant declaration of an emergency. There are, however, other conditions, which would not be identified through evaluation of the fission product barriers, that warrant declaration of an emergency. The remainder of Side 1 and all of Side 2 provide questions to determine if the initiating conditions are such that an emergency condition exists.

The flow path was developed to insure that all applicable initiating conditions were evaluated and duplication of assessments were minimized, where applicable. This insures timely evaluation of the conditions. Similar events are grouped together on the flow path for ease of understanding; however, all steps of the flow path are analyzed to insure that all initiating conditions are fully evaluated.

Unusual Events are declared when conditions warrant, and a higher level declaration is not needed. Once the Flowpath is completed, if a declaration of an Alert, Site Area Emergency, or General Emergency is not needed, the Site Emergency Coordinator is directed to evaluate against the Unusual Event Matrix. This Matrix is located at the bottom of the Flowpath on Side 2.

If a higher level classification is in effect, the Unusual Event Matrix is not examined in order to expedite initiation of the actions required by the higher level declaration.

A Notification of Unusual Event as defined in NUREG-0654 is referred to as "NOUE" in Attachment 1 and is equivalent to the HNP "Unusual Event" classification.

IV. ATTACHMENTS

Attachments to this document provide a cross reference between NUREG-0654 example initiating conditions and the HNP method for classifying the condition.

Attachment 1 lists Notification of Unusual Event (NOUE) conditions.

Attachment 2 lists Alert conditions.

Attachment 3 lists Site Area Emergency conditions.

Attachment 4 lists General Emergency conditions.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 1
Emergency Core Cooling System (ECCS) initiated and discharge to vessel.	

HNP EAL Initiating Condition:

N/A

EXPLANATION:

This Initiating Condition was deleted by Rev. 96-1, corresponding to PLP-201, Revision 26, in response to implementation of EPPOS No. 1

1) Planned discharges to the vessel are required to comply with technical specification and ASME Boiler and Pressure Vessel Code, Section XI, surveillance requirements for pump and valve testing. These events are planned, do not challenge the plant, and do not represent an emergency condition.

2) Inadvertent discharge of ECCS to the vessel, in and of itself, does not represent an emergency condition (the event would be reportable in accordance with 10CFR50.72).

3) Required ECCS actuation may be an indicator of an RCS barrier challenge. Challenges to the RCS barrier are adequately addressed in Appendix 1 of NUREG-0654 under the example ICs for Unusual Event #5, Alert #5, and Site Area Emergency #1. The HNP initiating conditions which correspond to each of these are:

   a. NUREG-0654, Unusual Event #5 "Exceeding either primary/secondary leak rate technical specification or primary system leak rate technical specification" is assessed in the existing HNP EALs through the Unusual Events 4-1-1, 4-2-1 and 4-3-1.

   b. NUREG-0654, Alert #5 "Primary coolant leak rate greater than 50 gpm" is assessed in the existing HNP EAL 2-1-2 via "RCS leakage > 50 GPM" indicating RCS breached on the Fission Product Barrier status board. An RCS breach results in declaration of an Alert emergency classification, or higher.

   c. NUREG-0654, Site Area Emergency #1 "Known loss of coolant accident greater than makeup pump capacity" is assessed in the existing HNP EALs on side 1 of the Flow Path via the Fission Product Barrier (FPB) analysis.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 2
Radiological effluent technical specification limits exceeded.	

HNP EAL Initiating Condition: EAL Reference No. **1-1-1**

1) GASEOUS OR LIQUID EFFLUENT(S) EXCEEDING TECHNICAL SPECIFICATIONS

1-1-1 VALID HIGH ALARM OCCURS ON ANY OF THE MONITORS IN EAL TABLE 5 AND THE RELEASE HAS NOT BEEN TERMINATED. (UNUSUAL EVENT EXISTS UNTIL EFFLUENT DISCHARGE IS TERMINATED AND ALL REQUIRED NOTIFICATIONS ARE MADE)

EXPLANATION:

Table 5 lists the plant effluent monitors. The alarm setpoints for these monitors are set below the T. S. effluent limit. If the alarm setpoint is exceeded, a T.S. Limit is being approached and an Unusual Event is declared if automatic isolation does not occur. The criteria for terminating NOUE extends the condition until notifications are completed.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE Example IC Item No.: 3

Fuel damage indication. Examples:

a. High off gas at BWR air ejector monitor (greater than 500,000 uCi/sec; corresponding to 16 isotopes decayed to 30 minutes; or an increase of 10,000 uCi/sec within a 30 minute time period).

b. High coolant activity sample (e.g., exceeding coolant technical specifications for iodine spike).

c. Failed fuel monitor (PWR) indicates increase greater than 0.1% equivalent fuel failures within 30 minutes.

HNP EAL Initiating Conditions: EAL Reference Nos. **2-1-1** and **2-2-1**

2) FUEL DAMAGE INDICATION

2-1-1 GROSS FAILED FUEL DETECTOR INDICATES AN INCREASE GREATER THAN 2E4 CPM WITHIN 30 MINUTES.

2-2-1 RCS SPECIFIC ACTIVITY EXCEEDS TECHNICAL SPECIFICATION 3.4.8 LIMITS FOR DOSE EQUIVALENT I-131 OR GROSS RADIOACTIVITY. (FOR DOSE EQUIVALENT I -131 THE EAL IS NOT EXCEEDED UNLESS THE 48 HOUR TIME INTERVAL, OR FIG. 3.4-1 LIMITS ARE EXCEEDED)

EXPLANATION:

a. HNP is a PWR and this item is applicable only to BWR plants.

b. EAL 2-2-1 addresses NUREG Item 3b. Technical Specifications permit corrective action when the Limiting Condition of Operation of the Technical Specification is exceeded. This HNP wording clarifies the intent to include corrective action steps as being an integral part of the Technical Specification. The terminology associated with these allowed actions was clarified in EAL rev. 99-1 to insure the consequential actions as a result of failure to satisfy Tech. Specs.(such as be in Hot Standby within 6 hours) would not be confused with "corrective actions." Exceeding Technical Specification limits for a period designated in the action statement is an analyzed condition of the plant and does not represent an emergency. This is consistent with the basis included in NRC EPPOS #1 for deletion of Unusual Events related to technical specifications.

c. EAL 2-1-1 addresses NUREG Item 3c an increase of 2×10^4 CPM within thirty minutes in the reading of the Gross Failed Fuel Detector is indication that fuel is starting to fail. Westinghouse provided this value along with a higher value which is used for the Alert Classification.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE Example IC Item No.: 4

Abnormal coolant temperature and/or pressure or abnormal fuel temperatures outside of technical specification limits.

HNP EAL Initiating Condition: EAL Reference No. **8-1-1**

8) OTHER PLANT OR EQUIPMENT PROBLEMS

8-1-1 INABILITY TO REACH REQUIRED SHUTDOWN (MODE 3) CONDITION WITHIN TECH. SPEC. TIME LIMITS

EXPLANATION:

Exceeding Technical Specification limits for the period designated in the action statement is an analyzed condition of the plant and does not, by itself, represent an emergency. If plant conditions are outside of technical specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame. When the plant cannot be SHUTDOWN (Mode 3) within the allowable action statement time, then declaration of an Unusual Event is warranted. This is consistent with the guidance provided in NRC EPPOS No. 1.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 5
Exceeding either primary/secondary leak rate technical specification or primary system leak rate technical specification	

HNP EAL Initiating Conditions: EAL Reference No. **4-2-1 & 4-3-1**

4) LOSS OF REACTOR COOLANT

4-2-1 ANY RCS PRESSURE BOUNDARY LEAKAGE

4-3-1 ANY OTHER RCS LEAKAGE IN EXCESS OF TECHNICAL SPECIFICATION 3.4.6.2 WITH THE 4 HOUR CORRECTIVE ACTIONS NOT SATISFIED.

EXPLANATION:

Technical Specification 3.4.6.2 addresses RCS allowed leakage. Technical Specifications, for other than Pressure Boundary leakage permit corrective action when the Limiting Condition of Operation of the Technical Specification is exceeded. The HNP EAL terminology clarifies the intent to include corrective action steps as being an integral part of the Technical Specification. Exceeding Technical Specification limits for a period designated in the action statement is an analyzed condition of the plant and does not represent an emergency. The terminology associated with these allowed actions was clarified in EAL Rev. 99-1 to ensure the consequential actions as a result of failure to satisfy Tech. Specs. (such as be in Hot Standby within 6 hours) would not be confused with "corrective actions." This is consistent with the basis included in EPPOS #1 for deletion of Unusual Events related to technical specifications.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE Example IC Item No.: 6

Failure of a safety or relief valve in a safety related system to close following reduction of applicable pressure.

HNP EAL Initiating Condition: EAL Reference Nos. **3-2-1** & **4-1-1**

3) LOSS OF SECONDARY COOLANT OR COOLING

3-2-1 FAILURE OF A SG SAFETY OR PORV TO FULLY RESET AFTER OPERATION.

4) LOSS OF REACTOR COOLANT

4-1-1 FAILURE OF A PRESSURIZER SAFETY OR PORV TO CLOSE FOLLOWING REDUCTION OF APPLICABLE PRESSURE.

EXPLANATION:

At HNP, the valves of concern are the Safety and Relief valves on the Steam Generator or Pressurizer. Any other relief valve that could malfunction is easily isolable and discharges to a closed system. However, the above listed valves could result in a challenge to the plant safety systems and require notification of an Unusual Event.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 7
Loss of offsite power or loss of onsite AC power capability.	

HNP EAL Initiating Condition: EAL Reference Nos. **5-1-1** and **5-2-1**

5) LOSS OF POWER

5-1-1 LOSS OF ALL OFFSITE POWER, OR

5-2-1 LOSS OF BOTH EMERGENCY DIESEL GENERATORS.

EXPLANATION:

The loss of offsite power capability is as stated. The loss of both Emergency Diesel Generators affects the redundancy of the safety related on site power, the power of concern. Loss of only one Diesel Generator is covered by the Tech. Spec. Action statement. Therefore, if both Diesel Generators are lost, an Unusual Event is declared regardless of the status of the Main Generator or offsite power, the normal power supplies to the safety related onsite power.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 8
Loss of containment integrity requiring shutdown by Technical Specifications.	

HNP EAL Initiating Condition: EAL Reference No. **8-1-1**

8) OTHER PLANT OR EQUIPMENT PROBLEMS

8-1-1 INABILITY TO REACH REQUIRED SHUTDOWN (MODE 3) CONDITION WITHIN TECH. SPEC. TIME LIMITS

EXPLANATION:

Exceeding Technical Specification limits for the period designated in the action statement is an analyzed condition of the plant and does not, by itself, represent an emergency. If plant conditions are outside of Technical Specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame. When the plant cannot be Shutdown (mode3) within the allowable action statement time, then declaration of an Unusual Event is warranted. This is consistent with the guidance provided in NRC EPPOS No. 1.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 9
Loss of engineered safety feature or fire protection system function requiring shutdown by Technical Specifications (e.g., because of malfunction, personnel error, or procedural inadequacy).	

HNP EAL Initiating Condition: EAL Reference No. **8-1-1**

8) OTHER PLANT OR EQUIPMENT PROBLEMS

8-1-1 INABILITY TO REACH REQUIRED SHUTDOWN (MODE 3) CONDITION WITHIN TECH. SPEC. TIME LIMITS

EXPLANATION:

Exceeding Technical Specification limits for the period designated in the action statement is an analyzed condition of the plant and does not, by itself, represent an emergency. If plant conditions are outside of Technical Specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame. When the plant cannot be Shutdown (mode3) within the allowable action statement time, then declaration of an Unusual Event is warranted. This is consistent with the guidance provided in NRC EPPOS No. 1.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 10
Fire within the plant lasting more than 10 minutes	

HNP EAL Initiating Condition: EAL Reference No. **10-1-1**

10) OTHER HAZARDS

10-1-1 FIRE WITHIN THE PROTECTED AREA NOT EXTINGUISHED WITHIN 15 MINUTES OF CONTROL ROOM NOTIFICATION OR VERIFICATION OF CONTROL ROOM ALARM

(THIS DOES NOT INCLUDE FIRES WITHIN OFFICE AREAS, TRASH BIN FIRES, H2 TANK VENT STACK FIRES EXTINGUISHED PER OP-152.02, OR OTHER SMALL FIRES OF NO PLANT SAFETY CONSEQUENCE).

EXPLANATION:

The guidance provided in NUMARC/NESP-007, Unusual Event HU2,has been applied to this EAL as outlined in NRC EPPOS #1. This includes the change in length of time criteria.

The Protected Area includes the plant and all areas within the security fence.

H_2 Vent Stack Fires have been exempted from event declaration due to their being a preplanned evolution and in accordance with plant design.

The HNP additional guidance better addresses the purpose of this IC - to define the magnitude and extent of fires that may be potentially significant precursors to damage to safety systems.

Escalation to higher emergency classifications would occur through the EAL flow path, Side 1, assessments of fires. If the fire may affect safety related equipment, an Alert would be declared. If that fire resulted in a complete loss of any safety related function, a Site Area Emergency would be declared.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE Example IC Item No.: 11

Indications or alarms on process or effluent parameters not functional in Control Room to an extent requiring plant shutdown or other significant loss of assessment or communication capability (e.g., plant computer, Safety Parameter Display System, all meteorological instrumentation).

HNP EAL Initiating Condition: EAL Reference Nos. **6-1-1**, **6-2-1** and **6-3-1**

6) LOSS OF MCB ANNUNCIATORS, ERFIS, OR COMMUNICATIONS CAPABILITY

6-1-1 UNPLANNED LOSS OF >75% OF MCB ANNUNCIATORS (ALBs) FOR >15 MINUTES AS DEFINED BY:

- MODE 1-4, TOTAL # ALBs = 30
- MODES 5-6, TOTAL #ALBs = 20 (ALB 1, 2, 4-13, 15, 22, 23, EITHER 24 OR 25 BASED ON EDG OPERABILITY, 26-28, & 30)

6-2-1 INABILITY OF ERFIS TO PERFORM ITS INTENDED FUNCTION FOR A CONTINUOUS PERIOD OF 4 HOURS, OTHER THAN PREPLANNED REMOVAL FORM SERVICE FOR MAINTENANCE OR MODIFICATION PURPOSES, WHILE IN MODES 1, 2, 3, OR 4 AS DEFINED BY:

- FAILURE OF BOTH CPUS.
- FAILURE OF BOTH DATA CONCENTRATORS.
- FAILURE OF BOTH DATA DISCS.
- INABILITY TO DISPLAY SPDS IN THE CONTROL ROOM.
- INABILITY TO UPDATE CURRENT DATA DISPLAYS IN THE CONTROL ROOM.

(THIS IS NOT TO BE CONSTRUED AS A FAILURE OF A SINGLE VARIABLE OR SMALL DATA SUBSET).

6-3-1 FAILURE OF BOTH SITE TELEPHONE AND EMERGENCY (HE&EC) TELEPHONE SWITCHES.

EXPLANATION:

The loss of Process or Effluent parameters that are important to safety are listed in the Tech. Spec. 3.3. Technical Specifications designate, in the action statement, corrective actions and time limits to accomplish these actions. These are analyzed conditions of the plant and do not, by themselves, represent an emergency (Ref. NRC EPPOS #1).

a) If plant conditions are outside of technical specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame.

b) When the plant cannot be shutdown (Mode 3) within the allowable action statement time, then declaration of an Unusual Event is warranted

The loss of alarms resulting in a loss of significant assessment capability has been defined in a manner consistent with NUMARC/NESP-007 (Refer to NUREG-0654 ALERT #14 for further details).

Due to the shift in emphasis from classification based upon dose assessment to classification based upon plant conditions, loss of meteorological instrumentation is no longer considered to meet the threshold of an Unusual Event. This is consistent with the guidance provided in NRC EPPOS No. 1.

Preplanned removal of ERFIS plant computer is allowed by Technical Specifications and does not result in a loss of assessment capability and is exempted from event declaration.

All of the other items addressed by the NUREG item, are listed above.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 12
Security threat or attempted entry or attempted sabotage	

HNP EAL Initiating Condition: EAL Reference No. **7-1-1**

7) SECURITY THREAT

7-1-1 CONFIRMED SECURITY EVENT WHICH INDICATES A POTENTIAL DEGRADATION IN THE LEVEL OF SAFETY OF THE PLANT AS INDICATED BY:

- UNAUTHORIZED ALTERATION OR TAMPERING HAS OR IS OCCURRING AFFECTING SAFETY RELATED EQUIPMENT.
- HOSTAGE/EXTORTION SITUATION THAT THREATENS TO INTERRUPT NORMAL PLANT OPERATIONS.
- CIVIL DISTURBANCE ONGOING BETWEEN THE SITE BOUNDARY AND THE PROTECTED AREA.

EXPLANATION:

HNP EAL Revision 99-1 updated the terminology used for assessment of this EAL condition. The referenced terminology continues to correspond to the NUREG-0654 condition and more clearly describes the conditions which correspond to this event classification. The revised terminology closely resembles that of the second issuance of NEI 97-03, Final Draft Rev. 3 (October 1998), Unusual Event HU4, for use in describing the appropriate conditions for each event classification associated with security events.

Notes:

- The NEI 97-03 reference to "Hostile Strike Action" was not included due to the fact that HNP is a non-union plant in a right to work state.
- Even though there has been no activity of this nature at the Harris Plant, the NEI 97-03 reference to "Civil Disturbance" criteria was included to provide consistency with the industry standard (NEI 97-03) and could potentially be associated with an "attempted entry."

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE Example IC Item No.: 13

Natural phenomenon being experienced or projected beyond usual levels:
a. Any earthquake felt in-plant or detected on station seismic instrumentation.
b. 50 year flood or low water, tsunami, hurricane surge, seiche.
c. Any tornado on site.
d. Any hurricane

HNP EAL Initiating Condition: EAL Reference Nos. **9-1-1, 9-2-1** and **9-3-1**

9) NATURAL PHENOMENA

9-1-1 INDICATION OF ANY TWO VALID SEISMIC SYMPTOMS LISTED ON EAL TABLE 6.
9-2-1 TORNADO REPORTED WITHIN THE EAB.
9-3-1 SUSTAINED WIND SPEED AT 10 METERS OF 74 MPH OR GREATER

EXPLANATION:

a. Symptoms of an earthquake are listed on EAL Table 6.
b. These NUREG-0654 items are not applicable to HNP EALs and were deleted by revision 96-01 implemented by Emergency Plan Revision 26.

Basis:

1) Hi level (50 year flood) is not applicable to HNP EALs as it not a threat to the plant (ref. HNP FSAR sections 2.4 and 3.4).
   a) The Harris plant is bounded by the Main and Auxiliary Reservoirs
   b) The maximum water level in either reservoir taking into account for 500 year flood levels (probable maximum flood (PMF)) coincident with wave run up from design wind velocity (123 mph), probable maximum precipitation (PMP), storm water drainage and runoff, is below the plant grade.
   c) As described in the FSAR, all safety related structures will not be jeopardized as a result of maximum still water level or wave run-up resulting from PMF, or storm water accumulated at the plant site due to a PMP, and therefor, it will not be necessary to bring the reactor to a cold shutdown for flood conditions.
   d) HNP Tech. Specs. do not provide Limiting Conditions For Operations associated with any maximum levels in the reservoirs. The maximum levels in the reservoirs have been analyzed and determined not to constitute adverse conditions of the plant and therefor do not represent an emergency.
2) Low level (drought) conditions in the main and auxiliary reservoirs are analyzed TS 3.7.5 conditions.
   a) Exceeding technical specification limits for the period designated in the action statement is an analyzed condition of the plant and does not, by itself, represent an emergency.
   b) The Unusual Event IC "Inability to reach required shutdown condition within Technical Specification Limits" would provide appropriate event classification in the event that the applicable Tech. Spec. time limits could not be complied with.
   c) If plant conditions are outside of technical specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame.
3) Tsunami does not apply to HNP due to its geographical location, approximately 140 miles from the Atlantic Ocean. (The only areas of the U. S. that are susceptible to tsunamis are those bordering on the Pacific Ocean or the Gulf of Mexico, Ref. HNP FSAR 2.4.6)
4) At HNP the only dynamic mechanisms considered to be credible for the production of high water levels is the probable maximum wind discussed in the assessment of no flooding potential and lack of EAL impact above. Therefor, hurricane surge and seiche water levels do not apply to HNP EALs.

c. Tornado is addressed in EAL 9-2-1. At HNP the "affected" area was extended to the EAB.
d. NOAA and Weather Services meteorological conditions equivalent to hurricane conditions are provided in EAL 9-3-1.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE Example IC Item No.: 14

Other hazards being experienced or projected:

a. Aircraft crash on-site or unusual aircraft activity over facility.

b. Train derailment on-site.

c. Near or onsite explosion.

d. Near or onsite toxic or flammable gas release.

e. Turbine rotating component failure causing rapid plant shutdown

HNP EAL Initiating Condition: EAL Reference Nos. **10-2-1, 10-3-1, 10-4-1** and **8-3-1**

10) OTHER HAZARDS

10-2-1 AIRCRAFT, TRAIN OR OTHER VEHICLE CRASH THAT MAY DAMAGE PLANT STRUCTURES CONTAINING FUNCTIONS OR SYSTEMS REQUIRED FOR SAFE SHUTDOWN OF THE PLANT

10-3-1 UNPLANNED EXPLOSION WITHIN THE PROTECTED AREA RESULTING IN VISIBLE DAMAGE TO PERMANENT STRUCTURES OR EQUIPMENT

10-4-1 UNPLANNED TOXIC OR FLAMMABLE GAS RELEASE WITHIN EAB (REFERENCE EAL TABLE 7)

8) OTHER PLANT OR EQUIPMENT PROBLEMS

8-3-1 TURBINE ROTATING COMPONENT FAILURE RESULTING IN A REACTOR TRIP, CASING PENETRATION, OR SIGNIFICANT DAMAGE TO MAIN GENERATOR SEALS.

EXPLANATION:

The HNP Emergency Action Levels utilize the basis from the NUMARC/NESP-007, Recognition Category H, Hazards and Other Conditions Affecting Plant Safety, were utilized in development of more definitive descriptions for these Initiating Conditions. This was done utilizing the NRC EPPOS #1 "Other Changes" for the NUMARC/NESP-007.

a&b. HNP EAL10-2-1 above, utilizes the NESP-007 Unusual Event HU1, Natural and Destructive Phenomena Affecting the Protected Area, item 4 guidance for the plant specific terminology. The EAL is intended to address such items as plane or helicopter crash, or train crash, that may potentially damage plant structures containing functions and systems required for safe shutdown of the plant. If the crash is confirmed to affect a plant vital area, the event may be escalated to Alert.

c. HNP EAL 10-3-1 above, utilizes the NESP-007 Unusual Event HU1, Natural and Destructive Phenomena Affecting the Protected Area, item 5 guidance for the plant specific terminology. For this EAL only those explosions of sufficient force to damage permanent structures or equipment within the protected area should be considered. As used here, an explosion is a rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment, that potentially imparts significant energy to near-by structures and materials. No attempt is made in this EAL to assess the actual magnitude of the damage. The occurrence of the explosion with reports of evidence of damage (e.g., deformation, scorching) is sufficient for declaration. The HNP specific step has been modified to include the word "Unplanned." This is done because periodically planned explosions occur which would result in an Unusual Event declaration when one was not warranted (Ex. Plugging SG tubes with explosive plugs) and is consistent with NUMARC/NESP-007 terminology of "an unanticipated explosion".

(continued on next page)

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 14 (continued)

d. HNP EAL 10-4-1 above, utilize the NESP-007 Unusual Event HU3, Release of Toxic or Flammable Gases Deemed Detrimental to Safe Operation of the Plant guidance for the plant specific terminology. At times, planned releases of toxic or flammable gases occur. These are controlled releases and must be done to continue safe and efficient plant operations. HNP does not consider that this type of release should require an Unusual Event declaration because it is done on purpose and in a controlled manner.

- EAL Table 7 lists Toxic, Flammable, and Asphyxiant Gases stored in bulk at HNP. It also provides guidelines for evaluating the applicability of this initiating condition.
- Events occurring outside of the Exclusion Area Boundary do not require Notification of an Unusual Event if they are not part of the site, as defined in the FSAR, and do not directly affect plant operations.

This is the reason that the above statements include the qualification that the event must have occurred inside of the EAB (Exclusion Area Boundary).

e. HNP EAL 8-3-1 utilizes the NESP-007 Unusual Event HU1, Natural and Destructive Phenomena Affecting the Protected Area, item 6 guidance for the plant specific terminology to address main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. Of major concern is the potential for leakage of combustible fluids (lubricating oils) and gases (hydrogen cooling) to the plant environs. This EAL is consistent with the definition of an Unusual Event while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment. Escalation of the emergency classification is based on potential damage done by missiles generated by the failure:

a) An Alert would be declared if the turbine rotating component failure resulted in a missile which impacted another plant structures or components within the power block with the reactor in modes 1, 2, 3 or 4 (EAL 10-2-2).

b) A Site Area Emergency would be declared if the above conditions were present, and a safety related equipment or structure was affected (EAL 10-2-3).

or in conjunction with a Steam Generator Tube Rupture related assessments.

Specific references to "unusual aircraft activity over the facility" and train "derailment" have been eliminated as a result of added guidance included with the EALs described above.

Basis:

1) The effect of train derailments and unusual aircraft activity over the facility are adequately addressed by the revised EAL descriptions based on NUMARC/NESP-007 documentation.

2) The Harris Plant receives spent fuel shipments by rail car. Unusual Event EAL 10-2-1 in the column "Other Hazards" provides for classifications associated with damage to the plant from rail traffic.

a) The spent fuel shipping plan contains emergency measures, notification and reportability requirements, and identifies personnel/staff to respond to "threats" associated with the transportation of spent fuel.

b) Site emergency plan implementation, emergency staff activation, and event classifications would occur for extreme events through:

1. Unusual Event IC for SEC Judgments, or
2. Alert EAL 11-1-2 for "Airborne rad levels indicate severe degradation in radioactive material control," or SEC Judgment that an Alert declaration is warranted.

3) The modified criteria avoid unwarranted event declarations which do not meet the intent of the Unusual Event condition as prescribed by NUREG-0654 through utilization of assessments and bases associated with NUMARC/NESP-007 EAL methodology and NRC EPPOS #1.

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE Example IC Item No.: 15

Other plant conditions exist that warrant increased awareness on the part of a plant operating staff or state and/or local offsite authorities or require plant shutdown under technical specification requirements or involve other than normal controlled shutdown (e.g., cooldown rate exceeding Technical Specification limits, pipe cracking found during operation).

HNP EAL Initiating Condition: EAL Reference Nos. **11-1-1, 8-1-1** and **8-2-1**

11) SITE EMERGENCY COORDINATOR JUDGMENT

11-1-1 OTHER PLANT CONDITIONS EXIST THAT WARRANT INCREASED AWARENESS ON THE PART OF THE PLANT OPERATING STAFF, CHATHAM COUNTY, HARNETT COUNTY, LEE COUNTY, WAKE COUNTY OR THE STATE OF NORTH CAROLINA.

8) OTHER PLANT OR EQUIPMENT PROBLEMS

8-1-1 INABILITY TO REACH REQUIRED SHUTDOWN (MODE 3) CONDITION WITHIN TECH. SPEC. TIME LIMITS

8-2-1 INADVERTENT CRITICALITY - EXTENDED AND UNPLANNED SUSTAINED POSITIVE STARTUP RATE (THIS DOES NOT INCLUDE CRITICALITY EARLIER THAN ESTIMATED DURING PLANNED REACTOR STARTUPS)

EXPLANATION:

Exceeding Technical Specification limits for the period designated in the action statement is an analyzed condition of the plant and does not, by itself, represent an emergency. If plant conditions are outside of Technical Specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame. When the plant can not be Shutdown (mode3) within the allowable action statement time, then declaration of an Unusual Event is warranted. This is consistent with the guidance provided in NRC EPPOS No. 1.

The item referring to Offsite authorities is as described in NUREG-0654.

An inadvertent criticality initiating condition (EAL 8-2-1) was added to the HNP EALs as an additional plant or equipment problem which is a site specific example of other events which meet the class description of an Unusual Event.. This EAL was added in Revision 99-1 using terminology consistent with selected terminology contained in the second issuance of NEI 97-03, Final Draft, Rev. 3 (October 1998), Item SU8

- This EAL replaces previous EAL conditions associated with mode dependent boron dilution events.
- Inadvertent Boron dilution events are ANS Condition II events and are "self-limiting." As such, event classifications above an Unusual Event would not be appropriate. The revised wording incorporates boron dilution events and inadvertent rod withdrawal events, the latter being the more limiting from an accident analysis perspective.
- Escalation to higher event classification would occur via either loss of function associated with in-ability to compensate for a dilution (EAL 8-2-2 or 8-2-3), fission product barrier analysis, or judgment (EAL 11-1-2).

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 16
Transportation of contaminated injured individual from site to offsite hospital	

HNP EAL Initiating Condition:

N/A

EXPLANATION:

This Initiating Condition was deleted by Rev. 96-1, corresponding to PLP-201, Revision 26, in response to implementation of NRC EPPOS #1.

BASIS: This event does not meet the threshold of the emergency class and is not a precursor to a more serious event as described in NRC EPPOS No. 1

NOTIFICATION OF UNUSUAL EVENT CROSS REFERENCE

NUREG-0654 EAL: NOUE	Example IC Item No.: 17
Rapid depressurization of PWR secondary side	

HNP EAL Initiating Condition: EAL Reference Nos. **3-1-1, 3-3-1** and **3-4-1**

3) LOSS OF SECONDARY COOLANT OR COOLING

3-1-1 RAPID DEPRESSURIZATION OF SG SECONDARY SIDE.

3-3-1 MAIN STEAM OR FEEDWATER BREAK.

(A BREAK IS A LEAK WHICH EXCEEDS THE OPERATORS ABILITY TO SHUTDOWN THE PLANT IN A CONTROLLED MANNER OR TO NOT EXCEED TECH SPEC COOLDOWN LIMITS)

3-4-1 SG BLOWDOWN LINE BREAK (MODES 1, 2, & 3).

EXPLANATION:

This item complies with the NUREG.

HNP added the rupture of a blowdown line as a specific method of secondary plant depressurization that would not result in an Alert, but would require notification of an Unusual Event.

HNP added the parenthetical information to assist personnel in determining if loss of secondary events should be considered a "break" for EAL purposes, as opposed to a small leak. This provides better consistency in classifying events and avoid minor leaks which do not meet the intent, nor NUREG-0654 definition of, an Unusual Event. This information matches a note for the same purpose from side 1, column 1

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT — Example IC Item No.: 1

Severe loss of fuel cladding.

a. High off gas at BWR air ejector monitor (greater than 5 Ci/sec; corresponding to 16 isotopes decayed 30 minutes).

b. Very high coolant activity sample (e.g., 300 µCi/cc equivalent of 1-131).

c. Failed fuel monitor (PWR) indicates greater than 1% fuel failure within 30 minutes of 5% total fuel failures

HNP EAL Initiating Condition: — EAL Reference No. **2-1-2**

2-1-2 1 FPB BREACHED/JEOPARDIZED

EXPLANATION:

Refer to Fission Product Barrier Analysis, section II.B, for assessment of the Fuel Fission Product Barrier analysis:

a. HNP is a PWR and this item is applicable only to BWR plants.

b. The Fission Product Barrier Analysis contains a step asking if RCS Dose Equivalent I-131 activity is > 300 µCi/cc. If the answer is YES, then the Fuel Fission Product Barrier is declared to be breached. With one fission product barrier breached, an Alert would be declared.

c. The Fission Product Barrier Analysis contains a step to evaluate the Gross Failed Fuel Detector (Side 1, column 1). The value used for the determination that the fuel FPB is breached was supplied by Westinghouse.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 2
Rapid gross failure of one steam generator tube with loss of offsite power.	

HNP EAL Initiating Condition: EAL Reference No. **2-1-2**

2-1-2 1 FPB BREACHED/JEOPARDIZED

EXPLANATION:

Refer to Fission Product Barrier Analysis, section II.C, for assessment of the RCS Fission Product Barrier analysis:

Several of the RCS Fission Product Barrier questions would result in declaration of the RCS breached if a Steam Generator tube leak occurred.

- This would happen with a leak rate much less than the design leakage associated with the failure of one tube.
- An RCS leak rate in excess of 50 gpm or entering EOP PATH-2 (Steam Generator Tube Rupture response) would result in the declaration of an Alert condition. This is done whether or not offsite power is available.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 3
Rapid failure of steam generator tubes (e.g., several hundred gpm primary to secondary leak rate)	

HNP EAL Initiating Condition: EAL Reference No. **2-1-2**

2-1-2 1 FPB BREACHED/JEOPARDIZED

EXPLANATION:

Refer to Fission Product Barrier Analysis, section II.C, for assessment of the RCS Fission Product Barrier analysis:

Several of the RCS Fission Product Barrier questions would result in declaration of the RCS breached if a Steam Generator tube leak occurred.

- This would happen with a leak rate much less than the design leakage associated with the failure of one tube.
- An RCS leak rate in excess of 50 gpm or entering EOP PATH-2 (Steam Generator Tube Rupture response) would result in the declaration of an Alert condition.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 4
Steam line break with significant (e.g., greater than 10 gpm primary to secondary leak rate (PWR) or MSIV malfunction causing leakage (BWR).	

HNP EAL Initiating Condition: EAL Reference No. **2-1-2**

2-1-2 1 FPB BREACHED/JEOPARDIZED

EXPLANATION:

Refer to Fission Product Barrier Analysis, section II.D, for assessment of the Containment Fission Product Barrier analysis:

Primary to secondary leakage in any SG >10 gpm with a nonisolable steam and/or feed break outside containment would result in the Containment being classified as breached. An Alert would be declared for one fission product barrier breached (EAL 2-1-2).

The HNP EALs evaluate feed line breaks in addition to steam line breaks.

Additionally if the primary to secondary leak rate exceeds 50 gpm the RCS would also be classified as breached and the emergency classification would be upgraded to Site Area Emergency due to a breach of two fission product barriers (EAL 2-1-3).

The MSIV malfunction aspect of this NUREG item is not applicable to HNP, a PWR plant.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 5
Primary coolant leak rate greater than 50 gpm.	

HNP EAL Initiating Condition: EAL Reference No. **2-1-2**

2-1-2 1 FPB BREACHED/JEOPARDIZED

EXPLANATION:

Refer to Fission Product Barrier Analysis, section II.C, for assessment of the RCS Fission Product Barrier analysis:

The RCS barrier assessment specifically asks if the RCS leakage is greater than 50. It also refers to other plant indications that would indicate a breach of the RCS barrier. If any indicator shows that the RCS is breached or in jeopardy, an Alert is declared unless a higher level declaration is warranted.

The 50 gpm leak rate is based on the requirements of NUREG-0654.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 6
Radiation levels or airborne contamination which indicate a severe degradation in the control of radioactive materials (e.g., increase of factor of 1000 in direct radiation readings within facility).	

HNP EAL Initiating Condition: EAL Reference Nos. **2-1-2** and **11-1-2**

2-1-2 1 FPB BREACHED/JEOPARDIZED

11-1-2 AIRBORNE RAD LEVELS INDICATE SEVERE DEGRADATION IN RADIOACTIVE MATERIAL CONTROL

EXPLANATION:

Refer to Fission Product Barrier Analysis:

- Section II.B, for assessment of the Fuel Fission Product Barrier analysis - Area radiation monitors in the vicinity of RCS fluids (letdown line related) are contained in EAL Table 2. If any of these monitors are 1000 times normal then the fuel fission product barrier is classified as breached.
- Section II.C, for assessment of the RCS Fission Product Barrier analysis - an increase of a factor of 500 (1/2 of the NUREG-0654 criteria) on the CNMT LEAK DET RAD MONITOR, Noble Gas Channel (in Containment), would result in a reading of >8E-3 µCi/cc and the RCS would be classified as breached.

In either case, an Alert is declared due to one fission product barrier breached (EAL 2-1-2).

All other cases would be addressed through the evaluation of airborne radiation levels indicating severe degradation in radioactive material control and a declaration of an Alert (EAL 11-1-2).

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 7
Loss of Offsite power and loss of all onsite AC power (see Site Area Emergency for extended loss).	

HNP EAL Initiating Condition: EAL Reference No. **5-1-2**

5-1-2 1A-SA OR 1B-SB NOT ENERGIZED

EXPLANATION:

Power availability to the safety related buses is used as the screening criteria for this condition. The safety related AC buses can receive power from the turbine through the Unit Auxiliary Transformers, from offsite power through the Start Up Transformers, (or backfeed through the Unit Auxiliary Transformers) or from the Emergency Diesel Generators. If both 1A-SA and 1B-SB are deenergized then an Alert, at a minimum, is declared.

An extended loss (>15 minutes) or loss of secondary system feed flow with reduction in core inventory would result in a higher level emergency declaration (refer to EALs 5-1-3 or 5-1-4).

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 8
Loss of all onsite DC power (see Site Area Emergency for extended loss).	

HNP EAL Initiating Condition: EAL Reference No. **5-2-2**

5-2-2 LOSS OF ALL ON-SITE ESF DC BUSSES (125VDC 1ASA AND 1BSB)

EXPLANATION:

ESF (Engineered Safety Features) DC is the plant-specific name for vital DC power. If it is lost, then an Alert is declared.

If the loss is extended (greater than 15 minutes), the Alert is upgraded to a Site Area Emergency (EAL 5-2-3).

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 9
Coolant pump seizure leading to fuel failure.	

HNP EAL Initiating Condition:

N/A

EXPLANATION:

In accordance with NRC EPPOS #1 this Initiating Condition is unnecessary because the concern is the fuel failure and not the seizure of the pump.

The condition is adequately addressed under (NUREG-0654) Alert #1.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 10
Complete loss of any function needed for plant cold shutdown	

HNP EAL Initiating Condition: EAL Reference No. **8-2-2**

8-2-2 COMPLETE LOSS OF ANY FUNCTION LISTED ON EAL TABLE 3

EXPLANATION:

EAL Table 3 provides guidance on what functions are needed to achieve shutdown. Ten (10) functions are listed and are identified as being required for cold shutdown (Modes 4 - 5) or Hot Shutdown (Mode 3).

The loss of function condition is evaluated on Side 1. A loss of power condition could result in a loss of a function. The loss of power (AC or DC) is addressed separately in the flow path. A loss of a function, if due to the loss of power is not classified per this section of the flow path, it is assessed under the cause (the loss of power).

If the function is required for Hot Shutdown a higher classification is warranted (EAL 8-2-3) otherwise an Alert is declared.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 11
Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical.	

HNP EAL Initiating Condition: EAL Reference No. **8-1-2**

8-1-2 ATWS WHILE IN MODE 1 OR 2

EXPLANATION:

At HNP this condition is termed an Anticipated Transient Without Shutdown (ATWS).

If an ATWS event has occurred and the manual reactor trip from the Main Control Board was successful, using either switch, an Alert is declared.

If the manual reactor trip was not successful, the event is upgraded to a Site or General Emergency depending on the status of the Fuel Fission Product.

The NUREG item refers to bringing the reactor subcritical. An ATWS from other than Modes 1 or 2 would not be associated with bringing the reactor subcritical, thus the addition of the criteria "while in Mode 1 or 2."

The HNP Main Control Board has 2 independent Manual Reactor Trip switches. Operation of either switch accomplishes the desired result.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 12
Fuel damage accident with release of radioactivity to containment or fuel handling building	

HNP EAL Initiating Condition: EAL Reference Nos. **2-4-2** and **2-5-2**

2-4-2 DAMAGE TO SPENT FUEL with ANY SPENT FUEL POOL RAD MONITOR > 100 mR/HR

2-5-2 PLANT IS IN MODE 6 with VALID CNMT VENT ISOL ACTUATION

EXPLANATION:

DAMAGE to spent fuel in the Fuel Handling Building is assessed to determine if a single or multiple assemblies are affected. Damage to / dropping a single assembly results in declaration of an Alert.

- Trigger points for the FHB area radiation monitors were calculated to provide a symptomatic indication of damage the affected assembly(s). These readings are projected to exist at the Radiation Monitor closest to the dropped assembly. This would result in an Alert being declared (EAL 2-4-2).
- The 100 mR/HR set point is based on dropping one spent fuel assembly and is used to actuate the FHB emergency ventilation system. Damage to multiple assemblies would be associated with higher radiation levels (700 mR/HR) and would result in escalation to a Site Area Emergency (EAL 2-4-3).

Fuel damage accident in Containment could only occur during Mode 6 (Refueling), so the sequence is bypassed if the plant is not in Mode 6.

- If fuel was damaged during refueling, a minor release would result in a Containment Ventilation Isolation and an Alert would be declared (EAL 2-5-2). The Containment Ventilation Actuation signal is established based on the activity release that would occur if one spent fuel assembly was dropped after removal from the core. Damage to multiple assemblies would be associated with higher radiation levels (6.5 R/HR) and would result in escalation to a Site Area Emergency (EAL 2-5-3)..

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 3
Fire potentially affecting safety systems.	

HNP EAL Initiating Condition: EAL Reference No. **10-1-2**

10-1-2 FIRE MAY AFFECT SAFETY RELATED (ESF) EQUIPMENT

EXPLANATION:

If a fire has occurred and it may affect Safety Related equipment an Alert (EAL 10-1-2) is declared.

If the results of the fire include a loss of any safety related function, the event classification would be escalated to a Site Area Emergency (EAL 10-1-3)

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 14
Most or all alarms (annunciators) lost.	

HNP EAL Initiating Condition: EAL Reference No. **6-1-2**

6-1-2 LOSS OF >75% OF MCB ANNUNCIATOR'S (ALB's) for >15 minutes (with additional conditions as described below).

EXPLANATION:

The guidance provided in NUMARC/NESP-007 has been applied to this EAL as outlined in NRC EPPOS #1.

The Main Control Board annunciators are referred to as ALB's (Annunciator Light Boxes).

Loss of greater than seventy-five (75) percent of the Main Control Board (MCB) annunciators is used to quantify "Most." A 15 minute threshold to exclude transient or momentary losses of annunciation is included.

An "unplanned" criteria has been incorporated to exclude scheduled maintenance and testing activities (except for the Site Area Emergency criteria).

Credit is provided for the availability of computer based indication equipment (SPDS/ ERFIS plant computer) to mitigate the impact from the loss of alarm capabilities such that .

1) An un-planned, extended, loss of most annunciators, with no transient in progress, would result in an Alert declaration if ERFIS data is not available (EAL 6-1-2) *
2) An un-planned, extended, loss of most annunciators, with a transient in progress, would result in an Alert declaration if ERFIS data is available (EAL 6-1-2).

EOP Path 1 entry (Reactor Trip or Safety Injection), Turbine runbacks greater than 25% and power oscillations greater than 10% are utilized to define the criteria for "significant transients"

A note indicates the total number of ALBs to aid in determining 75%. Also when shutdown 10 ALBs are not associated with operating/operable systems and the total number of ALBs should be considered as 20.

An extended loss of most annunciators, with a transient in progress, without ERFIS data available, would result in a Site Area Emergency declaration (EAL 6-1-3). This would apply whether or not the annunciators were out of service as a pre-planned activity or not.

* this would only result in an Unusual Event (EAL 6-1-1) if ERFIS data is available.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 15
Radiological effluents greater than 10 times technical specification instantaneous limits (an instantaneous rate which, if continued over 1 hour, would result in about 1 MR at the site boundary under average meteorological conditions).	

HNP EAL Initiating Condition: EAL Reference No. **1-1-2**

1-1-2 MONITOR IN EAL TABLE 5 READING >10 TIMES THE HIGH ALARM SETPOINT

EXPLANATION:

EAL Table 5 lists the plant liquid and gaseous effluent radiation monitors. The setpoints for these monitors are less than or equal to the Tech Spec instantaneous limits.

An Alert is declared if any of these monitors exceeds its alarm setpoints by a factor of ten as listed within the NUREG crieria.

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 16
Ongoing security compromise.	

HNP EAL Initiating Condition: EAL Reference No. **7-1-2**

7-1-2 EITHER OF THE FOLLOWING SECURITY EVENTS WITHIN THE PA:

- BOMB DISCOVERED WITHIN THE PA POTENTIALLY AFFECTING SAFETY RELATED EQUIPMENT
- IMMINENT THREAT OF, OR ACTUAL INTRUSION INTO THE PA BY A HOSTILE FORCE

EXPLANATION:

HNP EAL Revision 99-1 updated the terminology used for assessment of this EAL condition.

The referenced terminology continues to correspond to the NUREG-0654 condition and more clearly describes the conditions which correspond to this event classification. The revised terminology is based on the guidance provided in NUMARC/NESP-007, Alert HA4, as outlined in NRC EPPOS #1.

The revised terminology closely resembles that of the second issuance of NEI 97-03, Final Draft Rev. 3 (October 1998), ITEM HA4 which added "BOMB discovered within the PROTECTED AREA potentially affecting (site specific) Safety Related Equipment" as an additional Example EAL.

"IMMINENT THREAT OF, OR ACTUAL" was used in the HNP terminology in place of "ACTUAL" as being more in-line with the HNP Safeguards Contingency Plan and related security related procedures and training. This is more conservative than the term of "actual."

Discovery of a bomb or intrusion into a Vital Area would result in escalation to a Site Area Emergency (EAL 7-1-3).

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT — Example IC Item No.: 17

Severe natural phenomena being experienced or projected.

a. Earthquake greater than OBE levels.

b. Flood, low water, tsunami, hurricane surge, seiche near design levels.

c. Any tornado striking facility.

d. Hurricane winds near design basis level.

HNP EAL Initiating Condition: EAL Reference Nos. **9-1-2, 9-2-2 and 9-3-2**

9-1-2 ANY TWO INDICATORS OF A SEISMIC EVENT LISTED ON EAL TABLE 6 with ANY YELLOW LIGHT ON TRIAXIAL RESPONSE SPECTRUM ANNUNCIATOR LIT

9-2-2 ADVERSE WEATHER with TORNADO HAS HIT THE POWER BLOCK

9-3-2 ADVERSE WEATHER with PROJECTED OR MEASURED SUSTAINED WIND SPEED AT 10 METERS > 95 MPH

EXPLANATION:

a. EAL Table 6 lists all available plant indications of a seismic event including indication of tremors or vibration. Any two of these indications are adequate for the operators to determine if an OBE has occurred. A yellow light on the Triaxial Response Spectrum Annunciator indicates that the event has exceeded 70% of the OBE level, a Red annunciator indicates that the event has exceeded the OBE level. If a Yellow annunciator is lit, but not a Red one, then an Alert is declared. If a Red annunciator is lit, then the OBE level has been reached or exceeded and an assumption that an SSE has occurred and, if the plant is in Modes 1-4, the event is upgraded to a Site Area Emergency (EAL 9-1-3). The event classificaiton at 70% of OBE is conservative.

b. Flood, low water, tsunami, hurricane surge, seiche are not applicable to HNP. Refer to explanation for NUREG-0654, NOUE Item 13, and FSAR sections 2.4 and 3.4.

c. If Adverse weather occurs, and a tornado strikes the Power Block, then an Alert is declared (EAL 9-2-2). If the plant is in Modes 1-4 and safety related equipment of structures are damaged, the event would be escalated to a Site Area Emergency (EAL 9-2-3).

d. If Adverse weather occurs, and projected or measured wind speeds exceed 95 MPH, then an Alert is declared (EAL 9-3-2). The 95 MPH wind speed is based on the 100 year reoccurrence described in the FSAR. If the plant is in Modes 1-4 and 1) wind speeds increase to > 155 MPH, or 2) safety related equipment of structures are damaged, the event would be escalated to a Site Area Emergency (EAL 9-3-3).

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT — Example IC Item No.: 18

Other hazards being experienced or projected

a. Aircraft crash on facility
b. Missile impacts from whatever source on facility
c. Known explosion damage to facility affecting plant operation.
d. Entry into facility environs of uncontrolled toxic or flammable gases
e. Turbine failure causing casing penetration

HNP EAL Initiating Condition: EAL Reference Nos. **10-2-2** and **10-3-2**

10-2-2 AIRCRAFT CRASH, MISSILE IMPACT OR UNPLANNED EXPLOSION INSIDE POWER BLOCK.

10-3-2 UNCONTROLLED OR UNPLANNED RELEASE OF TOXIC OR FLAMMABLE GAS INTO POWER BLOCK REF EAL TABLE 7

EXPLANATION:

a, b, & c. These conditions result in declaration of an Alert (EAL 10-2-2) unless Safety Related equipment or structures are affected with the plant not in Cold Shutdown, which would result in escalating the emergency classification to a Site Area Emergency (EAL 10-2-3).

d. This condition results in declaration of an Alert (EAL 10-3-2) unless the and the gas is flammable or lack of access is a safety problem with the plant not in Cold Shutdown, which would result in escalating the emergency classification to a Site Area Emergency (EAL 10-3-3).

EAL Table 7 lists Toxic, Flammable, and Asphyxiant Gases stored in bulk at HNP. It also provides guidelines for evaluating the applicability of this initiating condition.

e. This Initiating Condition was deleted by Rev. 96-1, corresponding to PLP-201, Revision 26, in response to implementation of EPPOS No. 1. A turbine failure resulting in casing penetration would result in declaration of an Unusual Event (EAL 8-3-1).

Basis:

1) HNP is a PWR and as such a penetration of the turbine casing will not result in a radiological release unless it occurs in conjunction with a steam generator tube rupture. The radiological release and/or steam generator tube rupture would be identified, and classified, by the radiological ICs or the Fission Product Barrier ICs.

2) Escalation of emergency classification, above the Unusual Event level, for events associated with missile damage from turbine rotating component failures which penetrate the casing, would occur as follows:

   a) An Alert would be declared if the turbine rotating component failure resulted in a missile which impacted other plant structures or components within the power block with the reactor in modes 1, 2, 3 or 4 (EAL 10-2-2).

   b) A Site Area Emergency would be declared if the above conditions were present, and a safety related equipment or structure was affected (EAL 10-2-3).

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 19
Other plant conditions exist that warrant precautionary activation of Technical Support Center and placing near-site Emergency Operations Facility and other key emergency personnel on standby.	

HNP EAL Initiating Condition: EAL Reference No. **11-1-2**

11-1-2 AIRBORNE RAD LEVELS INDICATE SEVERE DEGRADATION IN RADIOACTIVE MATERIAL CONTROL, or

ANY PLANT CONDITION EXISTS THAT IN THE JUDGEMENT OF THE SUPERINTENDENT - SHIFT OPERATIONS OR SITE EMERGENCY COORDINATOR, WARRANTS AN ALERT DECLARATION

EXPLANATION:

A separate step is provided for the discretion to declare an Alert (EAL 11-1-2) for airborne radiation levels, even if specific levels addressed in other steps have not been exceeded.

Other plant conditions are Judgment calls as provided in (EAL 11-1-2) as described in the NUREG.

An uncontrolled Boron dilution assessment had previously been included in the HNP EALs because it was an early indication of the potential loss of plant shutdown margin which could result in an unplanned criticality.

The EAL was removed in Revision 99-1, and was replaced with an inadvertent criticality assessment (EAL 8-2-1) using terminology contained in the second issuance of NEI 97-03, Final Draft, Rev. 3 (October 1998), Item SU8.

Inadvertent Boron dilution events are ANS Condition II events and are "self-limiting." As such, event classifications above an Unusual Event would not be appropriate.

Escalation to higher event classification would occur via either loss of function associated with in-ability to compensate for a dilution (EAL 8-2-2 or 8-2-3), fission product barrier analysis, or judgment (EAL 11-1-2).

ALERT CROSS REFERENCE

NUREG-0654 EAL: ALERT	Example IC Item No.: 20
Evacuation of Control Room anticipated or required with control of shutdown systems established from local stations.	

HNP EAL Initiating Condition: EAL Reference No. **10-4-2**

10-4-2 CONTROL ROOM EVAC REQUIRED OR ANTICIPATED

EXPLANATION:

This is as described in the NUREG.

If the Control Room must be evacuated, control is shifted to the Auxiliary Control Panel (ACP) which contains all of the controls needed to maintain the plant in Hot Shutdown or to conduct a controlled cooldown to Cold Shutdown.

If the evacuation is required or anticipated and the Auxiliary Control (Shutdown) Panel is not operational with the Control Room evacuated for >15 minutes, the Alert is upgraded to a Site Area Emergency (EAL 10-4-3).

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 1
Known loss of coolant accident greater than makeup pump capacity.	

HNP EAL Initiating Condition: EAL Reference No. **2-1-3**

2-1-3 2 FPB's BREACHED/JEOPARDIZED

EXPLANATION:

The High Head Centrifugal Charging Pumps at HNP can supply several hundred gpm flow at normal operating pressure with significantly higher flow rates if system pressure decreases. A Reactor Coolant System leak of this magnitude would result in a Site Area Emergency (EAL 2-1-3) declaration as a result of several potential paths. With the plant at normal operating temperature, an RCS leak of this magnitude will result in a rise of Containment pressure to greater than 3.0 psig within a few minutes. Reactor Coolant System leakage >50 gpm and >3.0 psig in containment results in classifying two fission product barriers as breached or jeopardized and a resultant Site Area Emergency event declaration. Any of six other methods for identification of an RCS Breach and at least two other methods for identification of a second Fission Product Barrier being breached or jeopardized would also be possible dependent on the specifics associated with the RCS leak.

A separate situation is possible if no CSIPs are available. In this situation the leak rate at which makeup pump capacity would be exceeded would be much lower. This is also adequately addressed in the HNP EAL scheme via the loss of function Initiating Condition which would require declaration of a Site Area Emergency for the loss of Charging Capability function, a function required for Mode 3. (EAL 8-2-3).

This NUREG-0654 example Initiating Condition is one in which several relatively unique characteristics of the Harris plant, and the integration of the operations Emergency Operating Procedures with the EAL scheme, result in a unique flow path logic. The NRC, through a Regional Initiative inspection (Report 50-400/91-20), evaluated the HNP EAL scheme in this area and determined that the Shearon Harris EAL flow paths for emergency detection and classification results in correct and sufficiently prompt emergency classifications, and which are in agreement with the guidance in NUREG-0654.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 2
Degraded core with possible loss of coolable geometry (indicators should include instrumentation to detect inadequate core cooling, coolant activity and/or containment radioactivity levels).	

HNP EAL Initiating Condition: EAL Reference No. **2-1-3**

2-1-3 2 FPB's BREACHED/JEOPARDIZED

EXPLANATION:

Refer to Fission Product Barrier Analysis. Several indicators would be available to identify a breach or jeopardy condition for two or possibly all three fission product barriers. This condition would be associated with a loss of coolant accident. For example: the RCS could indicate breached by RCS leakage > 50 gpm (or CNMT leak detection rad monitor > 8E-3 µCi/cc). Fuel could indicate jeopardized by elevated thermocouple temperatures and/or reduced RVLIS level or breached by Gross Failed Fuel Detector 7E+5 CPM increase within 30 minutes. Containment may indicate jeopardized due to pressure > 3 psig.

If all three of the fission product barriers were breached or jeopardized this condition would be classified as a General Emergency (EAL 2-1-4).

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 3
Rapid failure of steam generator tubes (several hundred gpm leakage) with loss of offsite power.	

HNP EAL Initiating Condition: EAL Reference No. **2-1-3**

2-1-3 2 FPB's BREACHED/JEOPARDIZED

EXPLANATION:

RCS leakage in excess of 50 gpm would require that the RCS be declared to be breached . In addition, if the SG tube leak was "several hundred gpm", the Containment would indicate Jeopardized due to the high SG press (1230 PSIG) coupled with the high SG level (82.4%). In addition, lifting of a SG safety is likely with loss of offsite power and the Containment would be classified as breached. This would show two FPB's breached/jeopardized resulting in a Site Area Emergency (EAL 2-1-3) declaration.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 4
BWR steam line break outside containment without isolation	

HNP EAL Initiating Condition:

N/A

EXPLANATION:

HNP is a PWR and this item is applicable only to BWR plants

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 5
PWR steam line bréak with greater than 50 gpm primary to secondary leakage and indication of fuel damage.	

HNP EAL Initiating Condition: EAL Reference No. **2-1-3**

2-1-3 2 FPB's BREACHED/JEOPARDIZED

EXPLANATION:

RCS leakage in excess of 50 gpm would require that the RCS be declared breached.

A steam line break coincident with primary to secondary leakage > 10 gpm would require the Containment to be declared breached.

These conditions would show at least two FPB's breached/jeopardized resulting in at least a Site Area Emergency (EAL 2-1-3) declaration, regardless of the status of the fuel.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 6
Loss of offsite power and loss of onsite AC power for more than 15 minutes	

HNP EAL Initiating Condition: EAL Reference No. **5-1-3**

5-1-3 1A-SA AND 1B-SB LOST FOR >15 MIN

EXPLANATION:

The 6.9 KV Emergency Busses, 1A-SA and 1B-SB are normally powered by the Main Generator or by off-site power. If normal power is lost, these busses are powered directly by the Emergency Diesel Generators. Therefore, if 1A-SA and 1B-SB are lost, all on-site and offsite AC power has been lost. When this condition lasts for >15 minutes, a Site Area Emergency (EAL 5-1-3) is declared.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 7
Loss of all vital onsite DC power for more than 15 minutes.	

HNP EAL Initiating Condition: EAL Reference No. **5-2-3**

5-2-3 LOSS OF ALL ON-SITE ESF DC BUSSES (125VDC 1ASA AND 1BSB) for > 15 MINs

EXPLANATION:

ESF (Engineered Safety Features) DC is the plant-specific name for vital on-site DC power. If this DC power supply is lost for greater than fifteen minutes, a Site Area Emergency(EAL 5-2-3) is declared.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 8
Complete loss of any function needed for plant hot shutdown.	

HNP EAL Initiating Condition: EAL Reference No. **8-2-3**

8-2-3 COMPLETE LOSS OF ANY FUNCTION LISTED ON EAL TABLE 3 for MODE 3 (excluding function lost due to loss of all AC or all DC power)

EXPLANATION:

EAL Table 3 is a listing of the plant functions required for hot or cold shutdown. Mode 3 is "Hot Standby" which is the plant condition where RCS temperature is greater than 350 ^{0}F and the Reactor is subcritical. This equates to the NUREG term "HOT SHUTDOWN."

A loss of power condition could result in a loss of a function. The loss of power (AC or DC) is addressed separately in the flow path. A loss of a function, if due to the loss of power is not classified per this section of the flow path, it is assessed under the cause (the loss of power).

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 9
Transient requiring operation of shutdown systems with failure to scram (continued power generation but no core damage immediately evident).	

HNP EAL Initiating Condition: EAL Reference No. **8-1-3**

8-1-3 ATWS WHILE IN MODE 1 OR 2 with MANUAL REACTOR TRIP NOT SUCCESSFUL (EITHER SWITCH)

EXPLANATION:

At HNP this condition is termed an Anticipated Transient Without Shutdown (ATWS).

If an ATWS event has occurred and the manual reactor trip from the Main Control, using either switch, was not successful the event is classified as a Site Area Emergency (EAL 8-1-3)

If the Fuel FPB is breached (core damage) the event would be escalated to a General Emergency per EAL 8-1-4.

The note following the declaration explains that the Site Area Emergency exists only as long as the rods remain out of the core (i.e., until the Reactor Trip is successfully executed, or the rods are fully inserted by other means).

The HNP Main Control Board has 2 independent Manual Reactor Trip switches. Operation of either switch accomplishes a "scram.".

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 10
Major damage to spent fuel in containment or fuel handling building (e.g., large objects damages fuel or water loss below fuel level).	

HNP EAL Initiating Condition: EAL Reference Nos. **2-3-3, 2-4-3** and **2-5-3**

2-3-3 SPENT FUEL POOL LEVEL ≤ 1 FT ABOVE TOP OF FUEL

2-4-3 DAMAGE TO SPENT FUEL with ANY SPENT FUEL POOL AREA RAD MON > 100 mR/HR

2-5-3 PLANT IS IN MODE 6 with VALID CNMT VENT ISOL ACTUATION and BOTH CNMT HI RANGE ACCIDENT MONITORS > 6.5 R/HR

EXPLANATION:

If the level is less than one foot above the spent fuel assemblies, the spent fuel is about to become uncovered and a Site Area Emergency is declared (EAL 2-3-3).

Damage to spent fuel in the Fuel Handling Building is assessed to determine if a single or multiple assemblies are affected. Trigger points for the FHB area radiation monitors were calculated to provide a symptomatic indication of damage the affected assembly(s). The 700 mR/HR criteria is based on the expected dose rate from dropping more than 1 spent fuel assembly with an escalation to a Site Area Emergency (EAL 2-4-3).

Fuel damage accident in Containment could only occur during Mode 6 (Refueling), so the sequence is bypassed if the plant is not in Mode 6.

- The Containment Ventilation Actuation signal is established based on the activity release that would occur if one spent fuel assembly was dropped after removal from the core.
- DAMAGE to more than one assembly would warrant upgrading the classification (EAL 2-5-3). The 6.5 R/HR reading is based on the expected reading from the radiation monitors due to dropping two spent fuel assemblies that have just been removed from the core.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 11
Fire compromising the functions of safety systems	

HNP EAL Initiating Condition: EAL Reference No. **10-1-3**

10-1-3 COMPLETE LOSS OF ANY SAFETY RELATED (ESF) FUNCTION DUE TO FIRE

EXPLANATION:

This is as described in the NUREG.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 12
Most or all alarms (annunciators) lost and plant transient initiated or in progress	

HNP EAL Initiating Condition: EAL Reference No. **6-1-3**

6-1-3 LOSS OF >75% OF MCB ANNUNCIATORS (ALBs), with AFFECTED SYSTEMS ERFIS DATA NOT AVAILABLE and SIGNIFICANT TRANSIENT (EOP PATH 1 ENTERED, >25% RUNBACK, OR >10% POWER OSCILLATIONS), and ALBs LOST FOR > 15 MINUTES

EXPLANATION:

The guidance provided in NUMARC/NESP-007 has been applied to this EAL as outlined in NRC EPPOS #1.

The Main Control Board annunciators are referred to as ALB's (Annunciator Light Boxes).

Loss of greater than seventy-five percent of the Main Control Board (MCB) annunciators is used to quantify "Most."

EOP Path 1 entry (Reactor Trip or Safety Injection), Turbine runbacks greater than 25% and power oscillations greater than 10% are utilized to define the criteria for "significant transients."

A 15 minute threshold to exclude transient or momentary losses of annunciation is included

A note indicates the total number of ALBs to aid in determining 75%. Also when shutdown 10 ALBs are not associated with operating/operable systems and the total number of ALBs should be considered as 20.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY Example IC Item No.: 13

a. Effluent monitors detect levels corresponding to greater than 50 mR/HR for 1/2 hour or greater than 500 mR/HR W.B. for two minutes (or five times these levels to the thyroid) at the site boundary for adverse meteorology.

b. These dose rates (listed in 13a) are projected on other plant parameters (e.g., radiation level in containment with leak rate appropriate for existing containment pressure) or are measured in the environs.

c. EPA Protective Action Guidelines are projected to be exceeded outside the site boundary.

HNP EAL Initiating Condition: EAL Reference Nos. **1-1-3 & 1-2-3**

1-1-3 PROJECTED DOSE >50 MREM TEDE AT OR BEYOND SITE BOUNDARY USING ADVERSE MET DATA with ESTIMATED DURATION OF RELEASE >30 MINs, or

PROJECTED DOSE >250 MREM THYROID CDE AT OR BEYOND SITE BOUNDARY USING ADVERSE MET DATA with ESTIMATED DURATION OF RELEASE >30 MINs, or

PROJECTED DOSE >500 MREM TEDE AT OR BEYOND SITE BOUNDARY USING ADVERSE MET DATA with ESTIMATED DURATION OF RELEASE >2 MINs, or

PROJECTED DOSE >2500 MREM THYROID CDE AT OR BEYOND SITE BOUNDARY USING ADVERSE MET DATA with ESTIMATED DURATION OF RELEASE >2 MINs

1-2-3 MEASURED WHOLE BODY DOSE RATE >50 MREM/HR AT OR BEYOND SITE BOUNDARY with ESTIMATED DURATION OF RELEASE >30 MINs, or

MEASURED I-131 EQUIVALENT CONC. >1.9E-7 uCi/cc AT OR BEYOND SITE BOUNDARY with ESTIMATED DURATION OF RELEASE >30 MINs, or

MEASURED WHOLE BODY DOSE RATE >500 MREM/HR AT OR BEYOND SITE BOUNDARY with ESTIMATED DURATION OF RELEASE >2 MINs, or

MEASURED I-131 EQUIVALENT CONC. >1.9E-6 uCi/cc AT OR BEYOND SITE BOUNDARY with ESTIMATED DURATION OF RELEASE >2 MINs

EXPLANATION:

a. The Projected Dose values (EAL 1-1-3) comply with NUREG-0654 as modified for use of TEDE and CDE values per EPA-400 and NRC EPPOS #1.

b. The measured values (EAL 1-2-3) are consistent with the recommendations stated in the NUREG.

The Thyroid dose values are listed in Equivalent 1-131 concentration which corresponds to the 250 MREM/HR and 2500 MREM/HR, utilizing the dose conversion factors contained in the HNP dose projection methodology in order to speed up the reporting process.

c. With implementation of the revised Protective Action Guidelines contained in EPA-400 the projected dose of 1 Rem whole body and 5 Rem thyroid have been deleted since these criteria now require a higher Emergency Classification (refer to NUREG-0654 EAL General Emergency, item 1.

This is consistent with the guidance issued by the NRC as EPPOS #1.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 14
Imminent loss of physical control of the plant	

HNP EAL Initiating Condition: EAL Reference No. **7-1-3**

7-1-3 EITHER OF THE FOLLOWING SECURITY EVENTS WITHIN A VITAL AREA:

- BOMB DISCOVERED WITHIN A VITAL AREA POTENTIALLY AFFECTING SAFETY RELATED EQUIPMENT
- CONFIRMED INTRUSION INTO A VITAL AREA BY A HOSTILE FORCE

EXPLANATION:

HNP EAL Revision 99-1 updated the terminology used for assessment of this EAL condition.

The revised criteria for Site Area Emergency conditions continue to correspond to the NUREG-0654 condition of "Imminent loss of physical control of the plant" through more descriptive and anticipatory references to events of significance within plant "Vital Areas." The revised terminology is based on the guidance provided in NUMARC/NESP-007, Site Area Emergency HS1, as outlined in NRC EPPOS #1, with the addition of a BOMB discovered within the VITAL AREA potentially affecting Safety Related Equipment. This was included in the second issuance of NEI 97-03, Final Draft Rev. 3 (October 1998), which added "BOMB discovered within the VITAL AREA potentially affecting (site specific) Safety Related Equipment" as an additional Example EAL.

Loss of plant control would result in escalation to a General Emergency (EAL 7-1-4).

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY Example IC Item No.: 15

Severe natural phenomena being experienced or projected with plant not in cold shutdown.

a. Earthquake greater than SSE levels.

b. Flood, low water, tsunami, hurricane surge, seiche greater than design levels, or failure of protection of vital equipment at lower levels.

c. Sustained winds or tornadoes in excess of design levels.

HNP EAL Initiating Condition: EAL Reference Nos. **9-1-3, 9-2-3 and 9-3-3**

9-1-3 ANY TWO INDICATORS OF A SEISMIC EVENT LISTED ON EAL TABLE 6 with ANY RED LIGHT ON TRIAXIAL RESPONSE SPECTRUM ANNUNCIATOR LIT and PLANT IN MODES 1, 2, 3 OR 4

9-2-3 ADVERSE WEATHER with TORNADO HAS HIT THE POWER BLOCK with DAMAGE TO SAFETY RELATED EQUIPMENT OR STRUCTURES and PLANT IN MODES 1, 2, 3 OR 4

9-3-3 ADVERSE WEATHER with PLANT IN MODES 1, 2, 3 OR 4 and either 1) PROJECTED OR MEASURED SUSTAINED WIND SPEEDS AT 10 METERS > 95 MPH DAMAGE TO SAFETY RELATED EQUIPMENT OR STRUCTURES or 2) PROJECTED OR MEASURED SUSTAINED WIND SPEEDS AT 10 METERS > 155 MPH

EXPLANATION:

a. EAL Table 6 lists all available plant indications of a seismic event including indication of tremors or vibration. If any two of these indications are present the operators determine if an OBE or SSE has occurred. HNP has no specific annunciation associated with assessment of seismic activity exceeding the SSE level. If a Red annunciator is lit then the OBE level has been reached or exceeded ,and it is assumed that an SSE may have been exceeded, and if the plant is in Modes 1-4, then a Site Area Emergency (EAL 9-1-3) is declared. This is conservative.

b. Flood, low water, tsunami, hurricane surge, and seiche are not applicable to HNP. Refer to explanation for NUREG-0654, NOUE Item 13, and FSAR sections 2.4 and 3.4.

c. During adverse weather:

- a tornado striking the power block and damaging safety related structures warrants declaration of a Site Area Emergency (EAL 9-2-3) if the plant is not in cold shutdown (modes 1-4)
- projected or measured sustained wind speeds of greater than 155 MPH , or safety related equipment of structures are damaged from high winds, declaration of a Site Area Emergency (EAL 9-3-3) is warranted if the plant is not in cold shutdown (modes 1-4)

HNP's tornado loading design (in the Fujita scale F5 range, refer to next page) is nearly three (3) times the maximum measurable velocity (approx. 100 MPH) of the HNP Anemometer. Evaluating for damage to equipment and systems (designed to not be damaged by a tornado) provides a more accurate indication of an event which is "in excess of design limits."

The plant Seismic Category I structures are designed to withstand the effects of the design wind, a maximum wind of 179 mph at 30 feet above plant grade. The design wind is based on a 1000-year return period " fastest mile of wind" which is significantly greater than the Standard Review Plan 3.3.1 design wind velocity which is based on a 100-year return period "fastest mile of wind."

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY Example IC Item No.: 16

Other hazards being experienced or projected with plant not in cold shutdown.

a. Aircraft crash affecting vital structures by impact or fire.

b. Severe damage to safe shutdown equipment from missiles or explosion.

c. Entry of uncontrolled flammable gases into vital areas. Entry of uncontrolled toxic gases into vital areas where lack of access to the area constitutes a safety problem.

HNP EAL Initiating Condition: EAL Reference Nos. **10-2-3** and **10-3-3**

10-2-3 AIRCRAFT CRASH, MISSILE IMPACT OR UNPLANNED EXPLOSION INSIDE POWER BLOCK with PLANT IN MODES 1, 2, 3, OR 4 with SAFETY RELATED EQUIPMENT OR STRUCTURE AFFECTED

10-3-3 UNCONTROLLED OR UNPLANNED RELEASE OF TOXIC OR FLAMMABLE GAS INTO POWER BLOCK REF EAL TABLE 7 with AFFECTED AREA HOUSES SAFETY RELATED EQUIPMENT with GAS IS FLAMMABLE OR LACK OF ACCESS IS A SAFETY PROBLEM with PLANT IN MODE 1, 2, 3 OR 4

EXPLANATION:

a&b. If an aircraft crash, missile impact or an unplanned explosion inside of the Protected Area (PA) occurs which affects safety related equipment, and the plant is not in cold shutdown, a Site Area Emergency (EAL 10-2-3) is declared.

c. Uncontrolled or unplanned release of Toxic (or Asphyxiant) or Flammable gas into the Power Block, if the release endangers personnel or equipment, or if access to equipment required to operate the plant is impeded, and with the plant not in cold shutdown results in declaration of a Site Area Emergency (EAL 10-3-3).

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 17
Other plant conditions exist that warrant activation of emergency centers and monitoring teams or a precautionary notification to the public near the site.	

HNP EAL Initiating Condition: EAL Reference No. **11-1-3**

11-1-3 ANY PLANT CONDITION THAT IN THE JUDGEMENT OF THE SUPERINTENDENT - SHIFT OPERATIONS OR SITE EMERGENCY COORDINATOR WARRANTS A SITE AREA EMERGENCY DECLARATION.

EXPLANATION:

The Site Emergency Coordinator may declare a Site Area Emergency (EAL 11-1-3) when he feels that it is warranted, based on his judgment which is consistent with the NUREG.

NOTE:

An uncontrolled Boron dilution assessment had previously been included in the HNP EALs because it was an early indication of the potential loss of plant shutdown margin which could result in an unplanned criticality.

The EAL was removed in Revision 99-1, and was replaced with an inadvertent criticality assessment (EAL 8-2-1) using terminology contained in the second issuance of NEI 97-03, Final Draft, Rev. 3 (October 1998), Item SU8.

Inadvertent Boron dilution events are ANS Condition II events and are "self-limiting." As such, event classifications above an Unusual Event would not be appropriate.

SITE AREA EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: SITE AREA EMERGENCY	Example IC Item No.: 18
Evacuation of Control Room and control of shutdown systems not established from local stations in 15 minutes.	

HNP EAL Initiating Condition: EAL Reference No. **10-4-3**

10-4-3 CONTROL ROOM EVAC REQUIRED OR ANTICIPATED and the Auxiliary Control Panel (ACP) is not operational with the Control Room evacuated for >15 minutes

EXPLANATION:

This item is as described in the NUREG.

If the Control Room must be evacuated, control is shifted to the Auxiliary Control panel (ACP) which contains all of the controls needed to maintain the plant in Hot Shutdown or to conduct a controlled cooldown to Cold Shutdown. If the evacuation is required or anticipated and the Auxiliary Control (Shutdown) Panel is not operational with the Control Room evacuated for >15 minutes, a Site Area Emergency (EAL 10-4-3) is declared.

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY Example IC Item No.: 1

a. Effluent monitors detect levels corresponding to 1 Rem/HR W.B. or 5 Rem/HR thyroid at the site boundary under actual meteorological conditions.

b. These dose rates are projected based on other plant parameters (e.g., radiation levels in containment with leak rate appropriate for existing containment pressure with some confirmation from effluent monitors) or are measured in environs.

HNP EAL Initiating Condition: EAL Reference Nos. **1-1-4** and **1-2-4**

1-1-4 PROJECTED DOSE >1000 MREM TEDE AT OR BEYOND THE SITE BOUNDARY, or

PROJECTED DOSE >5000 MREM THYROID CDE AT OR BEYOND THE SITE BOUNDARY

1-2-4 MEASURED DOSE RATE >1000 MREM/HR AT OR BEYOND THE SITE BOUNDARY, or

MEASURED I -131 EQUIV CONC >3.9 E-6 µCi/cc AT OR BEYOND THE SITE BOUNDARY

EXPLANATION:

a. Projected Dose Calculations are performed using effluent rad monitors in accordance with Emergency Plan implementing procedures. If the levels of 1000 mREM TEDE or 5000 MREM Thyroid CDE are exceeded, a General Emergency (EAL 1-1-4) is declared.

The revised EPA (EPA-400) Protective Action Guidelines are expressed in terms of total effective dose equivalent, which includes the 50 year internal dose commitment from inhalation of the plume.

The internal dose commitment cannot be expressed as a dose rate without the period of time of exposure (inhalation) to the plume being stated for the point of interest. To convert the NUREG-0654 example EAL to a dose rate of 1 Rem/hour (TEDE) in a meaningful way, the assumed duration of inhalation must be one hour.

Similarly, a "Committed Effective Dose Rate" to the thyroid of 5 Rem/hour must assume an inhalation period of 1 hour. Any other periods of time for inhalation result in rates different than these which could, or could not, exceed the EPA 400 Protective Action Guidelines for total exposure, and would not be consistent with the definition of a General Emergency.

Hence the use of a separate Emergency Action Level expressed as a dose rate is redundant to the Emergency Action Level expressed as dose.

b. Projected Dose Calculations performed as addressed in Item a, also include projections based on Containment radiation levels when pressure is above 0 psig and SG radiation level based on Main Steam Line radiation. If levels of 1000 MREM TEDE or 5000 MREM Thyroid CDE are exceeded, a General Emergency (EAL 1-1-4) is declared.

A measured dose rate >1000 mRem/HR at or beyond the site boundary or I-131 equivalent concentration >3.9 E-6 µCi/cc at or beyond the site boundary will result in a General Emergency (EAL 1-2-4).

A measurement of 3.9 E-6 µCi/cc at/or beyond the site boundary is the equivalent of a dose rate to the thyroid of 5000 MREM/HR. The information is provided in this manner because it does not require conversion and can quickly be reported to the Site Emergency Coordinator, in this form.

The above values comply with NUREG-0654 as modified for use of TEDE and CDE values per EPA-400 and NRC EPPOS #1.

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY	Example IC Item No.: 2
Loss of 2 or 3 fission product barriers with a potential loss of 3rd barrier (e.g., loss of primary coolant boundary, clad failure, and high potential for loss of containment).	

HNP EAL Initiating Condition: EAL Reference No. **2-1-4**

2-1-4 3 FPBs BREACHED/JEOPARDIZED

EXPLANATION:

Refer to the analysis of the Fission Product Barriers for a detailed analysis of each barrier.

The NUREG requires that if two barriers are breached and a potential exists for a loss of the third fission product barrier, a General Emergency should be declared. The plant has taken the position that if all three barriers are intact, but the potential exists for all of them to breach, a General Emergency Classification (EAL 2-1-4) is warranted. Therefore, HNP considers a jeopardized (not yet breached) barrier as being in the same category as a breached barrier for emergency classification purposes.

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY	Example IC Item No.: 3
Loss of physical control of the facility	

HNP EAL Initiating Condition: EAL Reference No. **7-1-4**

7-1-4 A HOSTILE FORCE HAS TAKEN CONTROL OF PLANT EQUIPMENT AND/OR VITAL AREA(S) SUCH THAT PLANT PERSONNEL ARE UNABLE TO OPERATE EQUIPMENT REQUIRED TO MAINTAIN SAFETY FUNCTIONS

EXPLANATION:

This item complies with NUREG-0654.

HNP EAL Revision 99-1 updated the terminology used for assessment of this EAL condition.

The revised criteria for General Emergency conditions continue to correspond to the NUREG-0654 condition of " Loss of physical control of the facility " through descriptive terminology to include maintenance of "Safety Functions" as the definition of "control of the facility."

The revised terminology is based on the guidance provided in NUMARC/NESP-007, General Emergency HG1, as outlined in NRC EPPOS #1, with updated guidance to reflect improvements similar to those in the second issuance of NEI 97-03, Final Draft Rev. 3 (October 1998).

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY Example IC Item No.: 4

Other plant conditions exist, from whatever source, that make release of large amounts of radioactivity in a short period possible, e.g., any core melt situation. See the specific PWR and BWR sequences below.

Notes:

a. For core melt sequences where significant releases from containment are not yet taking place and large amounts of fission products are not yet in the containment atmosphere, consider 2 mile precautionary evacuation. Consider 5 mile downwind evacuation (45^0 to 90^0 sector) if large amounts of fission products (greater than gap activity) are in the containment atmosphere. Recommend sheltering in other parts of the plume exposure Emergency Planning Zone under this circumstance.

b. For core melt sequences where significant releases from containment are not yet taking place and containment failure leading to a direct atmospheric release is likely in the sequence but not imminent and large amounts of fission products in addition to noble gases are in the containment atmosphere, consider precautionary evacuation to 5 miles and 10 mile downwind (45^0 to 90^0 sector).

c. For core melt sequences where large amounts of fission products other than noble gases are in the containment atmosphere and containment failure is judged imminent, recommend shelter for those areas where evacuation cannot be completed before transport of activity to that location.

d. As release information becomes available, adjust these actions in accordance with dose projections, time available to evacuate and estimated evacuation times given current conditions.

HNP EAL Initiating Condition:

N/A

EXPLANATION:

Notes a, b, and c refer to core melt situations (Generic). Note d is general information and applies to any classification.

The notes are addressed by the Analysis of Fission Product Barriers. If a core melt situation exists, it will be addressed by the Fission Product Barrier analysis.

In the Emergency Action Level Network, a potential loss of any of the fission product barriers (jeopardized) is treated the same as a breached fission product barrier. For the purposes of Emergency Classification, this is an appropriate and conservative treatment of fission product barrier breaches. These situations would result in a General Emergency and the details at the NUREG would be addressed through the Protective Action Recommendation Emergency Plan Implementing Procedure.

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY Example IC Item No.: 5

Example PWR Sequences: (page 1 of 2)

a. Small and large LOCA's with failure of ECCS to perform leading to severe core degradation or melt in from minutes to hours. Ultimate failure of containment likely for melt sequences. (Several hours likely to be available to complete protective actions unless containment is not isolated).

b. Transient initiated by loss of feedwater and condensate systems (principal heat removal system) followed by failure of emergency feedwater system for extended period. Core melting possible in several hours. Ultimate failure of containment likely if core melts.

c. Transient requiring operation of shutdown systems with failure to scram which results in core damage or additional failure of core cooling and makeup systems (which could lead to core melt).

HNP EAL Initiating Conditions: EAL Reference Nos. **2-1-4, 5-1-4 & 8-1-4**

2-1-4 3 FPB's BREACHED/JEOPARDIZED

5-1-4 1A-SA OR 1B-SB NOT ENERGIZED with RCS PRESSURE >360 PSIG with >222.5 KPPH FEED FLOW NOT AVAILABLE with FULL RANGE RVLIS LEVEL NOT >62%

8-1-4 ATWS WHILE IN MODE 1 OR 2 with MCB MANUAL REACTOR TRIP NOT SUCCESSFUL (EITHER SWITCH) with FUEL FPB BREACHED

EXPLANATION:

a. The Fission Product Barrier Analysis explains the reasoning used to determine if a breach or jeopardy of one or more fission product barriers is indicated.

The RCS would indicate breached from RCS leakage >50 gpm or CNMT Leak Detection Radiation Monitor Noble Gas Channel >8E-3 µCi/cc or CNMT Hi Range Accident Monitor >17.5 R/HR.

For either a small or large size LOCA the Containment pressure would rapidly rise to >3 psig resulting in classifying the Containment fission product barrier as being in jeopardy.

A precursor to severe core degradation or melt would be indicated by CNMT High Range Monitor >17.5 R/HR, Gross Failed Detector or RCS activity measurement exceeding the breach criteria, or the Core Cooling Critical Safety function would indicate "Red" for thermocouple temperatures >1200 ^{0}F or Full Range RVLIS >39% and thermocouple temperatures >730 ^{0}F and would result in classifying the fuel as in Jeopardy.

As a result, there would be early indication of precursors to the NUREG condition which would result in declaration of a General Emergency (EAL 2-1-4).

b. The plausible conditions associated with a complete and sustained loss of all available feedwater flow would be initiated by a loss of electrical power. Refer to item 5.d on the next page

c. At HNP this condition is termed an Anticipated Transient Without Shutdown (ATWS).

If an ATWS event has occurred and the manual reactor trip from the Main Control, using either switch, was not successful an assessment of core status is performed. If the Fuel FPB is breached (core damage) a General Emergency (EAL 8-1-4) is declared.

The HNP Main Control Board has 2 independent Manual Reactor Trip switches. Operation of either switch accomplishes a "scram."

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY — Example IC Item No.: 5

Example PWR Sequences: (page 2 of 2)

d. Failure of offsite and onsite power along with total loss of emergency feedwater makeup capability for several hours. Would lead to eventual core melt and likely failure of containment.

e. Small LOCA and initially successful ECCS. Subsequent failure of containment heat removal systems over several hours could lead to core melt and likely failure of containment.

HNP EAL Initiating Conditions: EAL Reference Nos. **5-1-4 & 2-1-4**

5-1-4 1A-SA OR 1B-SB NOT ENERGIZED with RCS PRESSURE >360 PSIG with >222.5 KPPH FEED FLOW NOT AVAILABLE with FULL RANGE RVLIS LEVEL NOT >62%

2-1-4 3 FPB'S BREACHED/JEOPARDIZED

EXPLANATION:

d. If AC power is not available, (1A-SA and 1B-SB Emergency Busses are deenergized) then the possibility of a total loss of feedwater exists.

If the plant is in a condition where Feedwater flow, or secondary heat sink, is required (i.e., "RCS PRESSURE >360 PSIG") (reference EAL Table 3) and 222.5 KPPH OF FEED FLOW is not AVAILABLE[1] (Loss of Steam Driven AFW pump) then core inventory is evaluated..

A General Emergency (EAL 5-1-4) is declared when RVLIS indicates <62% Full Range level.

The 62% Valve is conservative in that it is much higher than the 39% level at which, concurrent with an elevated thermocouple temperature of 730 ^{0}F, the fuel fission product barrier would become jeopardized.

e. The fission product barrier analysis explains the reasoning used to determine if a breach or jeopardy of one or more of the fission product barriers is indicated.

The RCS would indicate breached from RCS leakage >50 gpm.

The loss of Containment heat removal would result in Containment pressure increasing to or remaining above 3 psig resulting in classifying the Containment fission product barrier as being in jeopardy.

A precursor to severe core degradation or melt would be indicated by CNMT High Range Monitor >17.5 R/HR, Gross Failed Detector or RCS activity measurement exceeding the breach criteria, or the Core Cooling Critical Safety function would indicate "Red" for thermocouple temperatures >1200 ^{0}F or Full Range RVLIS >39% and thermocouple temperatures >730 ^{0}F and would result in classifying the fuel as in jeopardy.

Entry Points T, U, and V are EOP Network entry points. If plant conditions degrade during an off-normal event, the EOP Network directs entry into the EAL Network to reevaluate the current Emergency Classification. This is done regardless of the initiating event or the initial performance of ECCS. By integrating the EOP's in this fashion, a slow degradation of the Fission Product Barriers can be anticipated resulting in a new evaluation of the Emergency Action Level.

Therefore, an initially successful ECCS performance and subsequent loss of control of the event would cause a reevaluation of the Fission Product Barrier status as well as the rest of the EAL Network.

Several symptoms are present which would provide early indication of precursors to the NUREG condition and would result in declaration of a General Emergency (EAL 2-1-4).

[1] The EOP Setpoint Study has calculated (under the guidance of the Westinghouse Owners Group) that this is sufficient flow to ensure that a heat sink exists.

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY	Example IC Item No.: 6
Example BWR Sequences:	

HNP EAL Initiating Condition:

N/A

EXPLANATION:

HNP is a PWR and this item is applicable only to BWR plants

GENERAL EMERGENCY CROSS REFERENCE

NUREG-0654 EAL: GENERAL EMERGENCY	Example IC Item No.: 7
Any major internal or external events (e. g., fires, earthquakes, substantially beyond design basis) which could cause massive common damage to plant systems resulting in any of the above.	

HNP EAL Initiating Condition: EAL Reference No. **11-1-4**

11-1-4 ANY RADIOLOGICAL CONDITION WARRANTING RECOMMENDATION TO EVACUATE OR SHELTER THE PUBLIC

EXPLANATION:

The HNP EALs utilize an analysis of each of the fission product barriers. This philosophy, in combination with the assessment of the other conditions listed on the EAL Flowpath, provides adequate and anticipatory identification of effects on the plant from unpostulated internal or external events when adding the judgment item.

In the HNP EALs the Site Emergency Coordinator can declare a General Emergency if he feels that it is warranted based on radiological conditions (EAL 11-1-4). This option is provided to give the Site Emergency Coordinator the flexibility to declare a General Emergency and issue Protective Action Recommendations for the public in the event that some potential initiating condition was not previously addressed.

DOCUMENT CHANGE SUMMARY

Page(s):	Change Description:
23	Two of the Unusual Event conditions within Category 9 "Natural Phenomena" were renumbered to achieve consistency in the numbering of Hurricane and Tornado related events below.
45	Adverse weather & Seismic Event Alert criteria were modified to add a "not in cold shutdown" criteria prior to upgrading the event classification. Also,wind speed thresholds and evaluation of "damage to safety related equipment or structures" has been incorporated into the adverse weather assessments.
63	Severe natural phenomena event classification upgrade criteria modified as indicated above.

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THAT CAN BE VIEWED AT THE RECORD TITLED: SIDE 2, Rev. 00-1: EMERGENCY ACTION LEVEL FLOW PATH

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