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SUBJECT: Forwards addl info for proposed emergency classification scheme as provided in NUMARC/NESP-007, rev 2.

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DUKE POWER

November 30, 1994

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

**Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287**

**Request for Additional Information Concerning Oconee Nuclear Station
Proposed Emergency Action Levels
(TAC NOS. M89467, M89468, AND M89469)**

Dear Mr. Wiens:

The attached enclosures provides additional information for the proposed Oconee Nuclear Site emergency classification scheme as provided in NUMARC/NESP-007, Rev. 2. Coleman Jennings (Emergency Planning) and Tony Lee (Operations) discussed the submittal with you on November 22, 1994. As a result of this phone conversation, Oconee agreed to provide the following:

- ◆ Response to the 37 questions posed in the 9/27/93 request for information
- ◆ Revised Basis Document
- ◆ Revised Emergency Classification Procedure (RP/0/B/1000/01)

If you have any additional questions regarding the response, please contact Coleman Jennings at (803) 885-3294.

Sincerely,


J. W. Hampton
VP, Oconee Nuclear Site

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RESPONSE TO NRC REVIEW OF OCONEE EALS

1. Unique identifier.

There is a unique identifier in the RP/0/B/1000/01 procedure. After each initiating condition, a page number of the basis document is set off by parenthesis to indicate where additional information can be found. For example (BD45) means Basis document, page 45.

2. ♦ The abbreviation SLC (Selected Licensee Commitment) has been added to the vocabulary listing in the classification procedure.
- ♦ Word violent has been added to the vocabulary listing in the classification procedure. (Violent - Force has been used in an attempt to injure site personnel or damage plant property.)
- ♦ "Inability to directly monitor" has been defined in the basis document and the classification procedure (Definition - Operational Aid Computer data points are unavailable or gauges/instruments/panel indicators are not readily available to the control room operator.)

3. Multi-unit factor. In the event that an emergency event were to be declared on separate units at the same time, the classification procedure indicates that the unit with the higher classification would carry the emergency status for the site. Information concerning all three units would be provided to the offsite agencies on the message sheets in accordance with RP/0/B/1000/15, Offsite Communications procedure.

The PRA Assessment Group for the Oconee Nuclear Site has reviewed the scenarios where multiple systems are shared by units. No additional events were identified for classification.

4. Concept of "imminent" has been placed at the bottom of the Fission Product Barrier chart, located on page 4 of the Oconee Basis Document..
5. Typographical errors have been corrected.

6. Lists of specific systems, structures omitted.

Oconee is a large, open facility both in the Turbine Building and the Auxiliary Building. It would be very difficult to list all the areas containing equipment of a safety significance. Therefore, instead of providing lists to be checked for classification, the Emergency Coordinator would use his knowledge of safety equipment and whether or not damage to this equipment was affecting its ability to perform its intended function.

The Emergency Coordinator has to use his discretion to make anticipatory decisions on plant status and for this reason, he should be allowed to determine which equipment at the time of the event was causing a problem. A list will just slow him down.

7. Origin of Dose Equivalent Iodine - 5 uCi/ml

The emergency action level for Fuel Clad Degradation is 5 uCi/ml DEI and is based upon the Oconee FSAR, Chapter 15, Table 15-14 of RCS Coolant Activity for 1% failed fuel.

8. Recognition Category A - Abnormal Rad Levels/ Radiological Effluent.
Enclosure 4.3 (Oconee Basis Document, pages 23-24, 28-29).

Note: Oconee does not have TS limits for liquid or gaseous effluent releases. These commitments have been published in the FSAR, Chapter 16.11 as Selected Licensee Commitments (SLC).

Note: There are no instantaneous release limit for liquids (everything is based on an annual average concentration). We would have to put straight RCS into Lake Hartwell to become an actual threat to our limits.

The liquid release rate Selected Licensee Commitments (SLC) are based on limiting liquid release rates to the UNRESTRICTED AREA to 10 times the Effluent Concentration values given in 10 CFR 20.1001-20.2401, Appendix B, Table 2, Column 2.

NOUE - Liquid effluent release is based on 2 times the SLC limit for 60 minutes. Radwaste Chemistry will utilize CP/0/B/5200/45 and/or CP/0/B/5200/12 to make this determination. If the calculations cannot be performed within one hour, then the monitor reading will be used as the classification mechanism.

ALERT - Liquid effluent release is based on 200 times the SLC limit for 15 minutes. Radwaste Chemistry will utilize CP/0/B/5200/45 and/or CP/0/B/5200/12 to make this determination. If the calculations cannot be performed within 15 minutes, then the monitor reading will be used as the classification mechanism.

The gaseous release rate Selected Licensee Commitments (SLC) are based on limiting gaseous release rates to the SITE BOUNDARY to 500 m³/yr total body.

NOTE: SLC has not been changed to reflect 10 CFR 20 terminology (TEDE vs Total Body.)

NOUE - Gaseous effluent release is based on 2 times the SLC limit for 60 minutes. Radiation Protection will utilize HP/0/B/1009/15 to make this determination. If the calculations cannot be performed within one hour, the monitor reading will be used as the classification mechanism.

ALERT - Gaseous effluent release is based on 200 times the SLC limit for 15 minutes. Radiation Protection will utilize HP/0/B/1009/15 to make the determination. If the calculation cannot be performed within 15 minutes, then the monitor reading will be used as the classification mechanism.

This information has been added to the Basis Document.

9. **Oconee does not have a perimeter radiation monitoring system
Oconee does not have an automatic real-time dose assessment capability**

NUMARC indicates these are required if a site has the capability. We don't have the capability, so the information was not included.

10. **NUMARC criteria for AU2-1: (Oconee Basis Document, page 25).**

EAL has been changed to read:

LT5 reading \leq 8" and decreasing with either no makeup or makeup not keeping up with leakage. (This emergency action level would indicate that the water level in the reactor refueling cavity is uncontrolled. At 8" on LT5, the fuel assemblies remain covered by 2 1/2 feet of water.)

Radiation monitor readings have been revised and have been provided on Enclosure 4.9 of RP/0/B/1000/01. The area monitor readings are based on 1000 times normal values for an Unusual Event classification. Chart is located on page 27 of the Oconee Basis Document.

11. NUMARC criteria for AA2-2, 3 and 4.

Page 31 of the Oconee Basis Document has been revised to include the following information:

◆ Valid readings for any one of the following monitors:

- ◆ RIA 3, 6, 41 or 49 HIGH alarm
- ◆ HIGH alarm for portable area monitors on the main bridge, auxiliary bridge, and spent fuel pool bridge.

RIA 3 monitors the refueling canal.

RIA 6 is the spent fuel pool monitor.

RIA 41 monitors the spent fuel pool gas.

RIA 49 monitors RB gas.

Portable area monitors are established during refueling outages and are located on the main bridge, auxiliary bridge, and spent fuel pool bridge.

The HIGH alarm for the radiation monitors are based on 10 CFR 20 personnel exposure guidelines.

- ◆ Report of visual observation irradiated fuel is uncovered
- ◆ Operators determine water level drop in either the Spent Fuel Pool or Fuel Transfer Canal will exceed makeup capacity such that irradiated fuel is uncovered

Oconee does not have instrumentation for measuring water level for the Reactor Refueling Cavity. Oconee does not have instrumentation for measuring water level for the Spent Fuel Pool and Fuel Transfer Canal. Therefore, visual observation and high radiation monitor readings from the area will be the main criteria for determining that irradiated fuel is uncovered or may become uncovered.

12. Rad level for continuous occupancy and infrequent areas.

Oconee appreciates the extensive review by the vendor for the radiological initiating conditions. He is absolutely correct in his findings. The AA3 initiating condition has been carefully reviewed and extensive changes have been made. Enclosure 4.9 is shown on Page 27 of the Oconee Basis Document.

Unusual Event radiation monitor readings will be based on 1000 times normal readings.

Alert determinations have been changed to greater than or equal to 5000 mRad/hr which is comparable to a reading for a very-high radiation area. The significance of the high reading would be that an uncontrolled radioactive release would be in progress in areas where personnel may be required to perform work. The area monitors shown on Enclosure 4.9 are not in areas where continuous occupancy is required.

13. Radiation monitor readings and procedure use:

Operations will use RP/0/B/1000/01, Enclosure 4.8, to determine dose to the public based on average annual meteorology. Enclosure 4.8 represents a predetermined dose calculation and would not need further assessment by the Control Room. Oconee does not require the control room to perform dose calculations. The TSC and the EOF have personnel available to perform dose calculations based on actual monitor readings and actual flowrates and actual meteorology. Dose Calculations will be preferable in the TSC and EOF instead of monitor readings. If the calculation cannot be completed within a fifteen-minute time frame, then the monitor readings will be used for emergency classification.

The Oconee Basis Document (pages 32 & 35) and RP/0/B/1000/01 (page 8) have been revised to include information that the monitor reading would be used only if dose calculations are unavailable within 15 minutes.

14. Field survey results, dose assessment

Total Effective Dose Equivalent replaces whole body and Committed Dose Equivalent (Adult Thyroid) replaces Child Thyroid. The NUMARC/NESP-007 document was published prior to 1/1/94 and is not current with regulations.

The emergency action level and the corresponding information have been revised to read exactly as the wording in the NUMARC document except for the references to TEDE and CDE (Committed dose equivalent) Adult Thyroid.

- ◆ Monitor reading for RIA 46, 57, 58 as shown on Enclosure 4.8
- ◆ Dose calculations result in a dose projection at the site boundary of:
 ≥ 100 mrem TEDE or ≥ 500 mrem CDE (Adult Thyroid)
- ◆ Field survey results indicate site boundary dose rates exceeding 100 mRad/hr expected to continue for more than one hour; or analyses of field survey samples indicate adult thyroid dose commitment (CDE) of 500 mrem (3.84 E-7 uCi/ml) for one hour of inhalation.

The Oconee Basis Document (pages 32 & 35) and RP/0/B/1000/01 (page 8) have been amended to include the statement that if the dose calculation cannot be completed within 15 minutes, the event will be classified using the monitor reading.

15. Actual meteorology

The TSC and the EOF have personnel available to perform dose calculations based on actual monitor readings and actual flowrates and actual meteorology. Dose Calculations using actual meteorological data is always preferable to predetermined monitor readings. If the calculation cannot be completed within a fifteen-minute time frame, then the monitor readings will be used for emergency classification. This additional information has been provided in the Oconee Basis Document (pages 32 & 35) and RP/0/B/1000/01 (page 8).

- 16. Point system will provide an additional way to classify the events that could be used by the Emergency Coordinator. We have found no problems with this system and do not believe the example provided by the vendor is warranted. Training and use of the procedure will eliminate examples as cited.**

17. Error has been corrected in Oconee Basis Document, page 4 for FPB matrix. Loss of **Both** the RCS and Fuel Clad are required for a declaration of a Site Area Emergency.

18. Critical safety functions are available numbers are used for critical safety functions instead of the color scheme used by Westinghouse.

19. Coolant activity - 100 uci/ ml

Oconee appreciates the careful review by the vendor. We have determined that an error was made and the correct value should be **300 uci/ml DEI** which represents an estimated fuel failure of 4%. Bases for the calculations is Engineering Calculation OSC-5283. (See pages 4 & 8 of the Oconee Basis Document)

20. Vessel level indication

The FPB matrix has been revised to include "Valid RVLS (reactor vessel level system) reading 0 inches" for the potential loss of the fuel cladding. (See pages 4 & 8 of the Oconee Basis Document).

21. Basis for Radiation monitor readings for FPB, Clad. Loss of Fuel Clad (See page 8 of Oconee Basis Document).

The basis for the radiation monitor readings for loss of the Fuel Clad Barrier was determined by engineering calculation OSC-5283, Core Damage Assessment Guidelines. A careful review of the monitor readings was made and an error was made in the transfer of data to Emergency Planning. The radiation monitor readings for loss of fuel clad is based on the amount of fuel clad failure (4%) that would equal 300 uCi/ml DEI released from the reactor coolant.

RIA 57 R/hr RIA 58 R/hr

0-.5 hr	≥	300	150
.5 - 2 hr	≥	80	40
2 - 8 hr	≥	32	16

22. **Justification for not including additional emergency action levels for Fuel Clad Barriers.**

Oconee did not use PAGES (air sampling) results as a measure for fuel cladding or containment because we do not plan to do containment sampling during accident conditions since the Containment Monitors can be related to per cent of failed fuel. We believe we have determined adequate measures for the loss of fuel cladding in the FPB matrix. The sampling only confirms the fuel damage determined from containment monitor readings.

23. **Basis for Oconee using "letdown isolated" for determining loss of RCS barrier.**

Normal letdown for Oconee is 70 gpm. HP 120 (Reactor Coolant volume control) will allow 160 gpm to enter the RC system at normal operating pressure. With letdown isolated, the operator can determine very quickly if the capacity of one HPI pump is or is not adequate. If letdown is not isolated, the operator performs a mathematical calculation to determine RCS makeup flow.

24. **SG rupture with leak on the secondary side. Why did Oconee not use the NUMARC description?**

Oconee did not use the NUMARC description because we felt it was hard to understand. The rationale we used was that a Steam Generator Tube Rupture would be indicative of a potential loss of the Reactor Coolant System. Any unisolable primary to secondary leak ($\geq .35$ gpm - .35 gpm is a Technical Specification value requiring automatic shutdown due to P/S leakage) to the atmosphere is a loss of containment. A SGTR together with an unisolable primary to secondary leak would be classified as a Site Area Emergency based on a potential loss of the RCS and a loss of containment which is exactly what is stated in the NUMARC reference document on page 5-30.

We believe we have met the intent of NUMARC guidance.

25. A. Basis for Oconee using "letdown isolated" for determining loss of RCS barrier.

Normal letdown for Oconee is 70 gpm. HP 120 (Reactor Coolant volume control) will allow 160 gpm to enter the RC system at normal operating pressure. With letdown isolated, the operator can determine very quickly if the capacity of one HPI pump is or is not adequate. If letdown is not isolated the operator performs a simple mathematical calculation to determine RCS makeup flow.

B. No site specific discriminating criteria that a SG is ruptured.

Oconee does not believe that we need to place identifying criteria for the operator to use to determine a SG rupture. Operators need to know that a SG rupture will require emergency plan emergency classification. When the FPB matrix is reviewed, they can easily spot the correct classification. This is the way our present procedure is written and we believe that it would be negative training to change their method of classifying a SG tube rupture.

26. Core Exit thermocouple readings.....greater than 1200 ° F....wording for this eal.

Oconee has revised the potential loss EAL for containment barrier to read as follows: (See Oconee Basis Document, page 4).

- ◆ Average of the 5 highest CETCs \geq 1200 degrees F > 15 minutes
- ◆ Average of the 5 highest CETCs \geq 700 degrees F and valid RVLS reading of 0 " > 15 minutes

We felt the words ineffective were not necessary for this EAL because the emergency actions in the Inadequate Core Cooling portion of the EOP, states the action required by the Operator within 15 minutes.

27. No lists included for fire determination.

Oconee proposes to revise the emergency action level submitted in the NUMARC Basis Document to read as follows:

Fire within the plant that is not extinguished within 15 minutes of Control Room notification or verification of a Control Room alarm.

Note: Within the plant means Turbine Building, Auxiliary Building, Reactor Building, Keowee Hydro.

Oconee is a three-unit site with a large open interconnecting turbine building and auxiliary building. To list contiguous areas as expressed in the NUMARC document would be cumbersome and ineffective. If the fire is in any of these buildings and the fire is not adversely affecting safety-related equipment and it takes the fire brigade a total of 15 minutes to respond and put out the fire, the event will be classified as an Unusual Event. If the fire does affect the operation of safety-related equipment and the fire damages the equipment or causes the equipment to malfunction, the event will be classified as an Alert.

We believe this process meets the intent of the NUMARC document.

28. Tornado, high winds.

FSAR design basis is included for wind velocity for tornados. (See page 69 of the Oconee Basis Document).

Oconee believes the fact that an event occurred is not the determining factor for classification but the damage caused by the event should drive the classification. Duke Power is of the opinion that neither the tornado nor the winds nor the missiles are the classifiers but the DAMAGE they did is the initiator of the emergency condition. Therefore, we stated that either damage or degraded performance in addition to the event would comprise the Alert emergency action level.

29. No list provided.

Oconee is a large, open facility both in the Turbine Building and the Auxiliary Building. It would be very difficult to list all the areas containing equipment necessary for safe shutdown of the unit. Therefore, instead of providing lists to be checked for classification, the Emergency Coordinator would use his knowledge of safety equipment and whether or not damage to this equipment was affecting the performance of the equipment to bring the unit to safe shutdown.

30. Turbine failure missiles.....

Oconee believes the fact that an event occurred is not the determining factor for classification but the damage caused by the event should drive the classification. Duke Power is of the opinion that neither the tornado nor the winds nor the missiles are the classifiers but the DAMAGE they did is the initiator of the emergency condition. Therefore, we stated that either damage or degraded performance in addition to the event would comprise the emergency action level.

31. Loss of all offsite power - NOUE.

Oconee has never used transformers as part of the classification process to determine loss of all offsite power. This emergency action level is the same as is used in our present Basis Document and emergency classification procedure. The NUMARC initiating condition is the same as in NUREG 0654 and we saw no reason to change the wording in the emergency action level since our operators have been trained to the present method. This would be negative training for our people to unlearn what constitutes loss of all offsite power.

32. Non-alarming indications:

SPDS is not a requirement for BWOOG emergency operating procedures. SPDS is used at Oconee as confirmatory information but is not required to be available at all times for use by the Operators. For this reason, SPDS should not be a mandatory portion of the emergency action level.

33. Failed fuel monitor.

Oconee does not have a failed fuel radiation monitor. Daily RCS samples are required.

34. Inability to maintain cold shutdown. (See page 40 of the Oconee Basis Document and page 10 of RP/0/B/1000/01).

Oconee has revised the emergency action level to read as follows:

◆ Loss of LPI and/or LPSW

AND

Inability to maintain RCS temperature below 200 ° F
as indicated by either of the following:

RCS temperature at the LPI pump suction
Visual observation

(Note: LPI is low pressure injection system.
LPSW is low pressure service water.

35. Loss of offsite AC power and loss of all onsite AC power (See page 12 of RP/0/B/1000/01 and page 50 of the Oconee Basis Document).

The initiating condition will be corrected to read exactly as shown in the NUMARC document.

36. Loss of functions required for hot shutdown. (See page 10 of RP/0/B/1000/01 and page 41 of the Oconee Basis Document).

Oconee has added an additional emergency action level as follows:

◆ SSF feeding steam generators per EOP

NUREG 0654 is not the basis for the NUMARC document and therefore the reference to anticipatory as it relates to NUREG 0654 is not warranted.

The Oconee SSF can provide the following:

- (a) Provide makeup to the seals to the Reactor Coolant pumps
 - (b) Provide low pressure service water to the steam generators
 - (c) Provide the capability to keep the unit in hot shutdown for 72 hours following an Appendix R fire
37. ATWS event - General Emergency (Page 44 of Oconee Basis Document).

Oconee believes that the EAL presented in the Oconee Basis Document meets the criteria to express extreme challenge. Oconee is unique in that we have the SSF to provide an additional source for a heat sink should HPI forced cooling and main and main/emergency feedwater become unavailable. CETCs reading $\geq 1200^\circ \text{F}$ is an indicator that a heat sink is not available and that the core is uncovered or will be very soon. Oconee does not have an indicator for water level below the top of active fuel.

We believe the emergency action level for this initiating condition meets the NUMARC criteria as it is presently stated.