UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 24, 2016

Mr. John Elnitsky
Senior Vice President
Nuclear Engineering
Duke Energy
526 South Church Street, EC-07H
Charlotte, NC 28202

SUBJECT: DUKE ENERGY PROGRESS, LLC, FOR SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1, AND H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 – REQUESTS FOR ADDITIONAL INFORMATION REGARDING APPLICATION TO ADOPT DPC-NE-3008-P, REVISION 0, "THERMAL-HYDRAULIC MODELS FOR TRANSIENT ANALYSIS" (CAC NOS. MF7112 AND MF7113)

Dear Mr. Elnitsky:

By letter dated November 19, 2015, Duke Energy Progress, LLC (Duke Energy) (previously Duke Energy Progress, Inc.), the licensee for the Shearon Harris Nuclear Power Plant, Unit 1 (HNP), and the H. B. Robinson Steam Electric Plant, Unit No. 2 (RNP), submitted to the U.S. Nuclear Regulatory Commission (NRC), a license amendment request requesting plant-specific review and approval of a reactor core design methodology report DPC-NE-3008-P, Revision 0, "Thermal-Hydraulic Models for Transient Analysis," for adoption into the HNP and RNP Technical Specifications.

The NRC staff has determined that additional information is needed to complete its review. The enclosed requests for additional information (RAIs) were e-mailed to the licensee in draft form on July 27, 2016. An RAI clarification call was held on August 10, 2016. During the call, the licensee agreed to provide responses to the RAIs by November 10, 2016. The NRC staff agreed with this date.

The NRC staff has determined that its documented RAIs (Enclosure 1) contain proprietary information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 2.390, "Public inspections, exemptions, requests for withholding." Accordingly, the NRC staff has prepared a redacted, nonproprietary version (Enclosure 2). However, the NRC will delay placing the nonproprietary RAIs in the public document room for a period of 10 working days from the date of this letter to provide Duke Energy the opportunity to comment on any proprietary aspects. If you believe that any information in Enclosure 2 is proprietary, please identify such information line-by-line and define the basis pursuant to the criteria of 10 CFR 2.390. After 10 working days, the nonproprietary RAIs will be made publicly available.

<u>The document transmitted herewith contains Sensitive Unclassified Non-Safeguards Information in Enclosure 1. When separated from Enclosure 1, this document is decontrolled.</u>

If you have any questions, please contact me at (301) 415-6256 or Dennis.Galvin@nrc.gov.

Sincerely,

Dennis J Galvin

Dennis J. Galvin, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-261 and 50-400

Enclosures:
1. Requests for Additional Information (Proprietary Information)
2. Requests for Additional Information (Nonproprietary Information)

cc w/enclosures:
Mr. Benjamin C. Waldrep
Site Vice President
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Mr. Richard Michael Glover
Site Vice President
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3581 West Entrance Road, RNPA01
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cc w/Enclosure 2: Distribution via Listserv (10 days after issuance of letter)

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST TO ADOPT

DPC-NE-3008-P, REVISION 0,

"THERMAL-HYDRAULIC MODELS FOR TRANSIENT ANALYSIS"

DUKE ENERGY PROGRESS, LLC

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

DOCKET NOS. 50-400 AND 50-261

By letter dated November 19, 2015 (Reference 1), Duke Energy Progress, LLC (Duke Energy) (previously Duke Energy Progress, Inc.), the licensee, submitted a license amendment request (LAR) requesting U.S. Nuclear Regulatory Commission (NRC) review and approval of its DPC-NE-3008-P, Revision 0, "Thermal-Hydraulic Models for Transient Analysis," methodology and to adopt this methodology into the Shearon Harris Nuclear Power Plant, Unit 1 (HNP), and H. B. Robinson Steam Electric Plant, Unit No. 2 (RNP), Technical Specifications (TSs). The methodology would be used for performing thermal-hydraulic transient analyses for non-loss-of-coolant-accident (non-LOCA) events at HNP and RNP. This methodology uses RETRAN-3D, which has received previous NRC review and approval at other Duke Energy sites (Reference 2). DPC-NE-3008-P relies on the previously-approved DPC-NE-3000-PA, "Thermal-Hydraulic Transient Analysis Methodology," Revision 5, which contains the entirety of Revision 3 (Reference 3) and information included in two Oconee Nuclear Station (Oconee) LARs (Reference 4 and Reference 6), approved in Reference 5 and Reference 7, respectively. DPC-NE-3008-P also describes new subchannel models of HNP and RNP to be used with VIPRE-01, which has also received prior NRC review and approval (Reference 8).

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (SRP), Section 15.0.2, "Review of Transient and Accident Analysis Methods" (hereafter SRP 15.0.2, Reference 9), provides guidance to the NRC staff for reviewing analytical models and computer codes used by licensees to analyze accident and transient analyses. In this review, the NRC staff used Section III.6 of SRP 15.0.2, which discusses the review of small changes to existing evaluation models, since the DPC-NE-3008-P methodology relies on the previously-approved DPC-NE-3000-PA methodology. Equivalent guidance for licensees and applicants is provided in Regulatory Guide 1.203, "Transient and Accident Analysis Methods" (Reference 10). In reviewing the benchmarks provided by the licensee against the plant analyses of record (AORs) for HNP and RNP, the NRC staff used appropriate sections of Chapter 15 of the SRP. The analysis review included an increase in feedwater flow (SRP 15.1.2), turbine trip (SRP 15.2.2), feedwater line break (SRP 15.2.8), loss of normal feedwater flow (SRP 15.2.7), complete loss of forced reactor coolant flow (SRP 15.3.2), locked rotor (SRP 15.3.3), and uncontrolled rod cluster control assembly bank withdrawal at power (SRP 15.4.2) (References 11 through 17). The VIPRE-01 model presented by the licensee for use at HNP and RNP was reviewed in accordance with the guidance of SRP 15.0.2 and SRP 4.4, "Thermal and Hydraulic Design" (Reference 18). The NRC staff has reviewed Duke

Energy's submittal and determined that responses to the following requests for additional information (RAIs) are needed in order to complete its review.

1. The NRC safety evaluation for DPC-NE-3000-PA (Reference 3) stated that review of actual licensing applications and associated conservative assumptions was beyond the scope of the DPC-NE-3000-PA review, since such details are to be presented in a future topical report. It is not clear whether this is the intent in DPC-NE-3008-P, Section 4.3, which provides benchmark analyses and states that, "The analyses are not intended for direct incorporation into the HNP FSAR or RNP UFSAR [updated final safety analysis report] and are not being submitted for review and approval as new analyses of record (AORs)."

   Clarify the licensing scope of the DPC-NE-3008-P methodology and clarify whether Duke Energy plans on submitting future analyses using this methodology for NRC review and approval before incorporating them into the HNP final safety analysis report (FSAR) and RNP UFSAR. Provide appropriate documentation for the RETRAN-3D and VIPRE-01 models according to SRP 15.0.2, Section III.2.A. The documentation should provide guidance for selecting or calculating all input parameters and code options and should also include transient- and accident-specific modeling guidelines.

2. When discussing the RETRAN-3D models for HNP and RNP, Section 4.1 of DPC-NE-3008-P states that, "Heat conductors are also modeled using similar detail as in Tables 3.2-1 and 3.2-2 of DPC-NE-3000, with various changes..." This is the only information provided in Duke Energy's LAR regarding the heat conductor modeling for the HNP and RNP RETRAN-3D models.

   SRP 15.0.2, Section III.2.B, states that, "For changes to previously approved models, the reviewers can limit their review to the new material if they determine there is nothing new that will invalidate the previous approval." However, stating that heat conductors are modeled "using similar detail" as the previous model, with "various changes," does not provide sufficient detail for the NRC staff to understand what has changed. Provide additional detail about the heat conductor modeling to justify that it meets the conditions and limitations of the RETRAN-3D safety evaluation and is capable of representing the HNP and RNP FSAR/UFSAR Chapter 15 transients.

3. The control systems used in the RETRAN-3D models for HNP and RNP are not discussed in DPC-NE-3008-P. It is unclear if the control systems are being modeled with an appropriate level of fidelity (see SRP 15.0.2, Section III.2.B). Provide an overview of the control system modeling. This overview should include a discussion of the valve modeling, pressure relief valve setpoints, delay times, reactor trip setpoints, and so forth. If the discussion does not provide each parameter value, it should at least include a discussion of the basis used to develop each value to be used in future analyses of record.

4. Use of the Chexal-Lellouche correlation is the subject of several conditions and limitations of the NRC staff's safety evaluation on RETRAN-3D (Reference 2). Duke Energy indicated in Section 4.2.4 of DPC-NE-3008-P that the Chexal-Lellouche drift flux correlation will be used, and provided the NRC staff's approval of the correlation at the Oconee as a basis to judge it acceptable in the present application. Considering that the application of the Chexal-Lellouche correlation for HNP and RNP is different from the

previous application at Oconee due to design differences between the plants, describe how Duke Energy ensures that the correlation will be used within its range of applicability at HNP and RNP as required by the NRC's RETRAN-3D safety evaluation.

5. RETRAN-3D has a non-equilibrium volume option that allows the liquid and vapor regions in a given volume to have different temperatures. Duke Energy stated in Section 4.2.4 of DPC-NE-3008-P that the non-equilibrium volume option is used in the pressurizer volume. This is a departure from the previously-approved model described in DPC-NE-3000-PA, where it was also applied in the reactor vessel head. However, Duke Energy stated that licensing applications of the RETRAN-3D model **[[**
   ]][1]. Clarify whether such applications will receive further NRC review. If not, in accordance with the guidance provided in SRP 15.0.2 and Regulatory Guide 1.203 (References 9 and 10), justify how Duke Energy will determine **[[**
   ]].

6. Duke Energy stated in Section 4.2.4 of DPC-NE-3008-P that the RETRAN-3D models for HNP and RNP do not model **[[** **]]**. This is a change from the previously-approved DPC-NE-3000-PA methodology. SRP 15.0.2, Section III.5, provides review guidance to the NRC staff regarding the conservatism of changes to previously-approved methodologies. **[[**
   ]].
   Provide justification why this modeling choice is acceptable, given that it is a departure from the previously-approved DPC-NE-3000-PA methodology.

7. RETRAN-3D has a non-conducting heat exchanger model that allows for simple heat transfer to or from fluid volumes without using a heat conductor. In Section 4.2.5 of DPC-NE-3008-P, Duke Energy stated that, "Licensing applications of the RETRAN-3D models for HNP and RNP may incorporate other uses of non-conducting heat exchangers to model, for example, ambient heat losses." Clarify whether such applications will receive further NRC review. If not, in accordance with the guidance provided in SRP 15.0.2 and Regulatory Guide 1.203 (Reference 9 and Reference 10), provide additional information on the uses of non-conducting heat exchangers that will be performed under this methodology, including specification of analysis scenarios and relevant modeling assumptions, and justify why the non-conducting heat exchanger model is appropriate for the scenarios modeled.

8. RETRAN-3D has a local conditions heat transfer model that allows the heat transfer from a heat conductor to vary depending on local fluid conditions in the attached fluid volume. In Section 4.2.6 of DPC-NE-3008-P, Duke Energy stated that, "Licensing applications of the HNP and RNP RETRAN models may use the local conditions heat transfer model for other volumes, such as the reactor vessel head, when conditions warrant." Clarify whether such applications will receive further NRC review. If not, In accordance with the guidance provided in SRP 15.0.2 and Regulatory Guide 1.203 (Reference 9 and Reference 10), provide additional information on the uses of the local conditions heat transfer model that will be performed under this methodology, including specification of analysis scenarios and relevant modeling assumptions. Discuss how

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[1] The text between bolded brackets **[[** **]]** contains proprietary information.

Duke Energy will determine that conditions in the transient scenario warrant the use of the model.

9. In Section 4.2.7 of DPC-NE-3008-P, Duke Energy states that the steady-state initialization process used for HNP and RNP is similar to the process used for the McGuire Nuclear Station (MNS) and the Catawba Nuclear Station (CNS) in terms of the inputs that may be adjusted.

    a. In order for the NRC staff to determine the scope of this aspect of the review, specify what has changed relative to the MNS/CNS process.
    b. How does Duke Energy ensure that these adjustments to initialize the steady-state model do not non-conservatively impact subsequent transient analyses?

10. SRP 15.0.2, Section II, states that chosen mathematical models and the solution of those models must be able to predict the important physical phenomena reasonably well from both qualitative and quantitative points of view. While the option for using a donor-cell formulation for computing momentum flux was removed from RETRAN-3D, the built-in arithmetic averaging formulation is known to produce numerically unstable results in certain situations. How will Duke Energy avoid these instabilities, and, given that the donor-cell formulation has been removed, what tools are available to correct them if they arise?

11. RETRAN-3D has a general transport model to calculate the transport and concentration of chemicals such as boric acid. In Section 4.2.15 of DPC-NE-3008-P, Duke Energy stated that, "Although the RETRAN-3D base models for HNP and RNP do not use the general transport model, it may be used for licensing applications of the HNP and RNP RETRAN models where significant reactivity effects associated with boron transport are encountered." Clarify whether such applications will receive further NRC review. If not, in accordance with the guidance provided in SRP 15.0.2 and Regulatory Guide 1.203 (Reference 9 and Reference 10), provide additional information on the uses of the boron transport model that will be performed under this methodology, including specification of analysis scenarios and relevant modeling assumptions, and discuss how Duke Energy will determine that reactivity effects associated with boron transport are significant.

12. Duke Energy stated in Section 4.2.16 of DPC-NE-3008-P that the RETRAN-3D accumulator component model is described and validated in Section III.11.0 of Electric Power Research Institute (EPRI) NP-7450, Volume 4. However, this section does not exist in the version of the RETRAN-3D assessment manual available from EPRI. Provide a description and assessment of the accumulator model.

13. Duke Energy evaluates the RETRAN-3D safety evaluation report (SER) conditions and limitations in Section 4.2.17 of DPC-NE-3008-P. However, this section lists only several conditions from the NRC staff's safety evaluation of RETRAN-3D. It is implied that disposition of the conditions and limitations not listed in Section 4.2.17 of DPC-NE-3008 can be found in Appendix C to DPC-NE-3000-PA, but this is not clear. Provide dispositions to the RETRAN-3D conditions and limitations not discussed in DPC-NE-3008-P, or confirm that they are provided in DPC-NE-3000-PA, and justify that the prior disposition remains applicable.

14. Duke Energy's disposition of RETRAN-3D SER condition 40 states that several new control block models are used, which have not been previously reviewed by the NRC staff, yet does not provide any detail beyond naming the new blocks used in the model. Provide additional detail on the function and purpose of each of these control blocks (or a citation to a publicly-available document where such information may be found) and how they are used in the HNP and RNP RETRAN-3D models, in order to comply with RETRAN-3D SER condition 40.

15. SRP 15.1.2 states that conservative scram characteristics should be assumed when analyzing a decrease in feedwater flow. However, the rod insertion speed and total negative reactivity insertion resulting from a reactor trip in the HNP and RNP RETRAN-3D models are unclear from the documentation provided in DPC-NE-3008-P. Please provide trip reactivity curves for the HNP and RNP models.

16. Section 4.3.2 of DPC-NE-3008-P compares results of the RETRAN-3D model for HNP to the AOR for the plant for the turbine trip event. For events like the turbine trip that result in a decrease in heat removal by the secondary system, SRP 15.2.3, Section III.6.J, instructs the NRC staff to review pressure safety and relief valve flow rates. Duke Energy states in Section 4.3.2 that the, "RETRAN-3D models of the pressurizer safety valves and main steam safety valves were justified by comparing the valve flows with the results documented in the AOR." The AOR does not present valve flows, and valve flow rates from the RETRAN-3D analysis were not provided. Given that the pressurizer safety valve and main steam safety valve flows are extremely important to the overall system response, how does Duke Energy justify that the valve flows in the RETRAN-3D models are reasonable? Are there other parameters that were compared to the AOR? How are these valves modeled?

17. Section 4.3.3 of DPC-NE-3008-P compares results of the RETRAN-3D model for HNP to the AOR for the plant for the main feedwater line break. For this event, SRP 15.2.8, Section I.1.H, identifies steam generator water level as a parameter of importance.

    In Figure 4.3-22, there is a difference between the steam generator level in the unaffected steam generators in the RETRAN-3D analysis relative to the AOR, starting around 5 seconds. Explain the cause of (a) the decrease and subsequent sudden increase in steam generator level between approximately 5 and 10 seconds and (b) the holdup of steam generator level between approximately 20 and 30 seconds.

18. Section 4.3.4 of DPC-NE-3008-P compares results of the RETRAN-3D model for RNP to the AOR for the plant for the loss of normal feedwater flow transient. SRP 15.2.7 Section III identifies coolant conditions as a key parameter for this event. Figures 4.3-36 through 4.3-38 show the reactor vessel inlet, outlet, and average temperatures for the RETRAN-3D analysis and the AOR. In these plots, the vessel outlet and average temperatures in the AOR rise slightly after the initial drop, before decreasing again over time. The RETRAN-3D analysis does not show this same phenomenon. Explain the difference in the phenomenon. Discuss and justify that the RETRAN-3D analysis is modeled appropriately.

19. Section 4.3.5 of DPC-NE-3008-P compares results of the RETRAN-3D model for HNP to the AOR for the plant for the complete loss of forced reactor flow transient. SRP 15.3.2 Section III.5, identifies coolant conditions as a key parameter for this event. The

discussion in the section notes that the vessel outlet temperature is higher in the RETRAN-3D analysis than it is in the AOR Figure 4.3-50 shows that the core outlet temperature is higher, even before the transient initiation in the RETRAN-3D analysis. Explain the difference between the RETRAN-3D steady-state vessel outlet temperature from the AOR and the impact on the new analysis.

20. Section 4.3.6 of DPC-NE-3008-P compares results of the RETRAN-3D model for RNP to the AOR for the plant for the locked rotor event. SRP 15.3.4, Section III, instructs the NRC staff to review reactor coolant system pressure. Figure 4.3-55 shows the pressurizer and core outlet pressures for both the RETRAN-3D analysis and the AOR. Explain why the RETRAN-3D core outlet pressure curve has noticeably different trends from the AOR. Explain what causes the core exit and pressurizer pressures to drop starting between 2.5 to 3 seconds, and why the pressurizer pressure drops first in the RETRAN-3D analysis as opposed to the AOR.

21. Section 4.3.7 of DPC-NE-3008-P compares results of the RETRAN-3D model for RNP to the AOR for the plant for uncontrolled rod control cluster assembly bank withdrawal at power event. SRP 15.4.2, Section III.6, presents the reactor coolant system pressure as a key parameter for the event. Figure 4.3-59 shows the pressurizer pressure. Explain why the RETRAN-3D pressurizer pressure in this analysis drops substantially faster after the trip than in the AOR.

22. Section 5 of DPC-NE-3008-P presents VIPRE-01 models that have been expanded relative to the previously-approved models for HNP and RNP discussed in DPC-NE-2005.

    a. Duke Energy stated that these models "are available as an option for licensing applications along with the continued use of generic models that use fewer subchannels." Since the NRC's safety evaluation requires VIPRE-01 users to describe the intended use of the code, what licensing applications are these expanded VIPRE-01 models intended to evaluate? Will they be submitted for future NRC review and approval?

    b. The pin power distribution to be used in the expanded VIPRE-01 models is described in Section 5.3, where Duke Energy states that the "cycle-specific reactor physics calculations of pin power distributions" will be used with "appropriate uncertainty factors applied." The approach taken is said to be "similar to the approach described for Oconee in DPC-NE-3000, Appendix E."

       VIPRE-01 SE condition 3 (Reference 8) requires users of the code to submit documentation describing how they intend to use VIPRE-01 and providing justification for their specific modeling assumptions. Given that the Oconee expanded VIPRE-01 model is different from those for HNP and RNP, and that the approach to determining power distribution is only similar to that used at Oconee, specify in additional detail how the power distribution will be determined for the HNP and RNP expanded VIPRE-01 models.

    c. Section 5.4 provides an evaluation of the VIPRE-01 safety evaluation conditions and limitations. VIPRE-01 SE condition 3 requires users of the code to "submit documentation describing how they intend to use VIPRE-01 and providing justification for their specific modeling assumptions". In dispositioning this condition on the use of VIPRE-01, Duke Energy refers to the statistical core design methodology described in Revision 5 of DPC-NE-2005. Are the HNP and RNP expanded VIPRE-01 models intended to be used with the statistical core design methodology? Are all the models, correlations, input values of plant specific data, and uncertainties to be applied as described in DPC-NE-2005, Rev. 5? Discuss any differences.

d. Regulatory Guide 1.203, Section 3.6, states that methodology documentation must discuss nodalization rationale. Other Duke Energy applications of VIPRE-01 (for example, those described in DPC-NE-3000-P-A and DPC-NE-2005-P-A) provided axial and radial nodalization sensitivity studies. Did Duke Energy perform similar studies for the expanded VIPRE-01 models for HNP and RNP? If not, why not? If so, discuss the results of these studies.

e. VIPRE-01 includes coefficients for crossflow momentum transfer and turbulent mixing between adjacent subchannels. Selection of these coefficients is important, particularly when modeling adjacent fuel assemblies from different fuel vendors, as appears to be an intended application of the expanded VIPRE-01 models for HNP and RNP. Section III.3 of SRP 4.4 instructs the NRC staff to determine that the values of void, pressure drop, and heat transfer correlations used to estimate fluid conditions are within the ranges of applicability specified by their authors or in previous staff reviews. However, these coefficients were not discussed in DPC-NE-3008-P. Justify how Duke Energy determined the crossflow and turbulent mixing coefficients. Explain how the choice of these coefficients is validated, particularly for mixed-core applications.

f. The importance of model assessment is discussed throughout SRP 15.0.2, Regulatory Guide 1.203, and SRP 4.4. However, Duke Energy provided no benchmarking and validation of the expanded VIPRE-01 models for HNP and RNP. How will these models be validated, particularly when used in mixed-core applications where limited data may be available?

REFERENCES:

1. R.T. Repko, Duke Energy Progress, Inc. (Duke Energy), letter to U.S. Nuclear Regulatory Commission (NRC) Document Control Desk, "Application to Revise Technical Specifications to Adopt Methodology Report DPC-NE-3008-P Revision 0, "Thermal-Hydraulic Models for Transient Analysis"," November 19, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15323A351).
2. S.A. Richards, NRC, letter to G.L. Vine, Electric Power Research Institute (EPRI), "Safety Evaluation Report on EPRI Topical Report NP-7450(P), Revision 4, "RETRAN-3D – A Program for Transient Thermal-Hydraulic Analysis of Complex Fluid Flow Systems" (TAC No. MA4311)," January 25, 2001 (ADAMS Accession No. ML010470342).
3. Duke Energy, "Thermal-Hydraulic Transient Analysis Methodology," DPC-NE-3000-PA, Revision 3, September 2004 (ADAMS Accession No. ML050680309).
4. Duke Energy, "Oconee Nuclear Station Mark-B-HTP Fuel Transition Methodology," DPC-NE-2015-P, September 2007 (ADAMS Accession No. ML082690091).
5. L.N. Olshan, NRC, letter to D. Baxter, Oconee Nuclear Station, "Oconee Nuclear Station Units 1, 2, and 3, Issuance of Amendments Regarding Use of AREVA NP Mark-B-HTP Fuel (TAC Nos. MD7050, MD7051, and MD7052)," October 29, 2008 (ADAMS Accession No. ML082800408).
6. R.A. Jones, Duke Energy, letter to NRC Document Control Desk, "Proposed License Amendment Request to Revise the Technical Specifications Pursuant to the Use of Gadolinia Integral Burnable Absorber," October 19, 2009 (ADAMS Accession No. ML092960626).
7. J. Stang, NRC, letter to P. Gillespie, Oconee Nuclear Station, "Oconee Nuclear Station, Units 1, 2, and 3 – Issuance of Amendments Regarding Approval for the Use of Gadolinia as an Integral Burnable Absorber (TAC Nos. ME2504, ME2505, and ME2506)," July 21, 2011 (ADAMS Accession No. ML11137A150).
8. Electric Power Research Institute (EPRI), "VIPRE-01: A Thermal Hydraulic Code for Reactor Cores," NP-2511-CCM-A, Revision 4, June 2007 (ADAMS Package Accession No. ML102100004 (non-public).
9. NRC, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 15.0.2, "Review of Transient and Accident Analysis Methods," March 2007 (ADAMS Accession No. ML070820123).
10. NRC, Regulatory Guide 1.203, "Transient and Accident Analysis Methods," December 2005 (ADAMS Accession No. ML053500170).
11. NRC, NUREG-0800, Section 15.1.2, "Increase in Feedwater Flow," Revision 2, March 2007 (ADAMS Accession No. ML070550005).
12. NRC, NUREG-0800, Section 15.2.2, "Turbine Trip," Revision 2, March 2007 (ADAMS Accession No. ML070300702).
13. NRC, NUREG-0800, Section 15.2.8, "Feedwater System Pipe Break Inside and Outside Containment (PWR)," Revision 2, March 2007 (ADAMS Accession No. ML070550009).
14. NRC, NUREG-0800, Section 15.2.7, "Loss of Normal Feedwater Flow," Revision 2, March 2007 (ADAMS Accession No. ML070300709).
15. NRC, NUREG-0800, Section 15.3.2, "Loss of Forced Reactor Coolant Flow Including Trip of Pump Motor and Flow Controller Malfunctions," Revision 2, March 2007 (ADAMS Accession No. ML070550010).
16. NRC, NUREG-0800, Section 15.3.3, "Reactor Coolant Pump Rotor Seizure," Revision 2, March 2007 (ADAMS Accession No. ML070550012).

17. NRC, NUREG-0800, Section 15.4.2, "Uncontrolled Control Rod Assembly Withdrawal at Power," Revision 3, March 2007 (ADAMS Accession No. ML063600414).
18. NRC, NUREG-0800, Section 4.4, "Thermal and Hydraulic Design," Revision 2, March 2007 (ADAMS Accession No. ML070550060).

If you have any questions, please contact me at (301) 415-6256 or Dennis.Galvin@nrc.gov.

Sincerely,

/RA/

Dennis J. Galvin, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-261 and 50-400

Enclosures:
1. Requests for Additional Information (Proprietary Information)
2. Requests for Additional Information (Nonproprietary Information)

cc w/enclosures:
Mr. Benjamin C. Waldrep
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Mr. Richard Michael Glover
Site Vice President
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