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W3F1-2009-0017

May 22, 2009

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

Subject: License Amendment Request NPF-38-281 to Revise
Technical Specification 6.9.1.11, Core Operating Limits Report
Waterford Steam Electric Station, Unit 3 (Waterford 3)
Docket No. 50-382
License No. NPF-38

REFERENCES: 1. Entergy letter dated August 2, 2007, "License Amendment Request
to Support Next Generation Fuel" (W3F1-2007-0037)
2. Entergy Letter to NRC dated March 10, 2008, "Supplement 2 RAI
Response to Amendment Request NPF-38-271 to Support Next
Generation Fuel" (W3F1-2008-0021)

Dear Sir or Madam:

In Reference 1, Entergy Operations, Inc. (Entergy) proposed to revise the Waterford Steam Electric Station, Unit 3 (Waterford 3) Technical Specification (TS) 6.9.1.11 to add new analytical methods to support the implementation of Westinghouse's Next Generation Fuel (NGF). During the submittal review process, a question was raised by the Nuclear Regulatory Commission (NRC). This Request for Additional Information (RAI) was informally transmitted to Waterford 3 on February 7, 2008. The RAI was for Waterford 3 to clarify why there are several methodologies listed in the TSs for the same parameter.

In Reference 2, Waterford 3 made a one-time commitment to review other similar plant's TS methodology references that reflect NRC approved methods used in establishing the Core Operating Limits Report (COLR) parameter limits. Based on that evaluation, Entergy proposes a change to TS 6.9.1.11, to minimize the number of references consistent with the guidance provided in Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications".

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NRK



Pursuant to 10 CFR 50.90, Entergy hereby requests an amendment to Waterford 3 TS 6.9.1.11, Core Operating Limits Report (COLR).

The proposed change has been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c) and it has been determined that this change involves no significant hazards consideration. The bases for these determinations are included in the attached submittal.

The proposed change does not include any new commitments. A similar change has been requested for Arkansas Nuclear One, Unit 2 (ANO-2).

Entergy requests approval of the proposed amendment by *May 13, 2010*. Once approved, the amendment shall be implemented within 90 days. The then current cycle-specific COLR will be updated and issued once this request has been approved. Although this request is neither exigent nor emergency, your prompt review is requested.

If you have any questions or require additional information, please contact Robert J. Murillo at 504-739-6715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 22, 2009.

Sincerely,

 for Joe Kowalewski

JAK/MEM/kmf

Attachments:

1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)

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Attachment 1

W3F1-209-0017

Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-38-271 for Waterford Steam Electric Station, Unit 3 (Waterford 3).

The proposed change will revise Waterford 3 Technical Specification (TS) 6.9.1.11, Core Operating Limits Report (COLR), by deleting the parenthetical COLR parameter-to-methodology cross-references, deleting reference to methodologies that are no longer used, deleting a method from the listing of NRC-approved methodologies due to it being a supplement to a base methodology already listed in TS 6.9.1.11, and updating the current references to existing methods.

2.0 PROPOSED CHANGE

The proposed changes are administrative in nature and will modify TS 6.9.1.11 by:

1. Deleting the parenthetical COLR parameter-to-methodology cross-references
2. Deleting the reference to the CESEC methodology (method number 6 in TS 6.9.1.11.1)
3. Deleting the reference to a supplement to a Topical Report that is already listed in the TS (CENPD-132, Supplement 4-P-A, Addendum 1-P-A, method number 19 in TS 6.9.1.11.1)
4. Correcting the reference to the CENTS methodology (change to the current Westinghouse topical report title and number, method number 9 to TS 6.9.1.11.1)

3.0 BACKGROUND

In Reference 1, Entergy Operations, Inc. (Entergy) proposed to revise the Waterford 3 TS 6.9.1.11.1 to add new analytical methods to support the implementation of Westinghouse's Next Generation Fuel (NGF). During the submittal review process, a question was raised by the NRC. This Request for Additional Information (RAI) was informally transmitted to Waterford 3 on February 7, 2008, and was framed as:

Under TAC MD6299, the proposed TS 6.9.1.11 COLR, addition of new methods to COLR, in the August 2, 2007 submittal, there are five new methodologies to be added to the TS COLR to support the coming cycle-specific operating parameters. However, many methods are proposed to support the same parameter. We would like the licensee to clarify that: (1) the proposed changes are applicable to the coming cycle; (2) how to apply the methods proposed to support the same parameter such as 3 methods for MTC, 4 methods for ASI, and 3 methods for Linear Heat Rate.

In Reference 2, Waterford 3 made a one-time commitment to review the COLR and its associated TS. Specifically, the commitment states:

Entergy commits to evaluate other similar plant's Technical Specification (TS) methodology references that reflect NRC approved methods used in establishing the COLR parameter limits. Based on that evaluation, Entergy will propose a change to TS 6.9.1.11.1, to minimize the number of references consistent with the guidance provided in Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications."

Reviewing the COLR information for possible updating included two categories of relevant documentation. One category is focused on relevant plant documentation, specifically the listing of NRC-approved methodologies in the TS and the COLR itself. In this category a review of both the Waterford 3 and ANO-2 documentation was supplemented with two other Combustion Engineering (CE) designed Nuclear Steam Supply Systems (NSSS) plants that utilize 16 x 16 fuel as well as a digital protection system. The plants selected were San Onofre Nuclear Generating Station (SONGS) and the Palo Verde Nuclear Generating Station (PVNGS). During the course of the review, the listing of NRC-approved methodologies of several Westinghouse NSSS plant designs were reviewed as well to broaden the base of the industry approach to COLR implementation. Furthermore, a CE NSSS plant design using 14 x 14 fuel and an analog protection system was included. These reviews provide a means to compare Waterford 3 to others in the industry for consistency and also address an element of the commitment made to the NRC.

The other category is the NRC regulatory requirements and guidance.

4.0 TECHNICAL ANALYSIS

The current Waterford 3 Updated Final Safety Analysis Report (UFSAR), TSs, and COLR were reviewed in conjunction with the listing of NRC-approved methodologies in the various TSs and COLRs described above. The purpose of this review was to identify whether the Waterford 3 TS 6.9.1.11.1 listing of NRC-approved methodologies and COLR differ in a noteworthy manner from similar documents for other facilities.

This review included the COLR parameter associations for Waterford 3. The results of this particular review helped to identify which specific methodologies were cited and their association with which particular COLR parameters. Two principal observations were made.

1. There is an older methodology referenced that is not used to establish an operating limit for a parameter value and should be considered for deletion (i.e., CESEC).
2. Methodologies used for UFSAR Chapters 6 and 15 safety analyses are cited for numerous parameters for which they are not the methodology explicitly used to establish the value for the parameter. Rather, the safety analysis results only confirm the acceptability of the parameter value which was actually established explicitly using another methodology (typically, physics). This is an iterative process wherein a parameter value is established based on core management / design considerations and the safety analysis results confirm its acceptability. If not acceptable, the core design is adjusted and a new parameter value established. This iterative process continues until the safety analysis results confirm the acceptability of the parameter in question when compared to NRC requirements.

An example of what Item 2 above is stating is the parameter Moderator Temperature Coefficient (MTC). Currently there are eight (8) separate methodologies listed for this parameter. These methodologies are as follows:

1. "Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores" (WCAP-11596-P-A), "ANC: A Westinghouse Advanced Nodal Computer Code" (WCAP-10965-P-A), and "ANC: A Westinghouse Advanced Nodal Computer Code: Enhancements to ANC Rod Power Recovery" (WCAP-10965-P-A Addendum 1)
2. "Qualification of the Two-Dimensional Transport Code PARAGON," (WCAP-16045-P-A)
3. "Technical Manual for the CENTS Code," WCAP-15996-P-A.
4. "Calculative Methods for the C-E Large Break LOCA Evaluation Model for the Analysis of C-E and W Designed NSSS" (CENPD-132, Supplement 3-P-A)
5. "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model" (CENPD-132, Supplement 4-P-A)
6. "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model – Improvements to 1999 Large Break LOCA EM Steam Cooling Model for Less Than 1 in/sec Core Reflood" (CENPD-132, Supplement 4-P-A, Addendum 1-P and Final Safety Evaluation for Westinghouse Electric Company (Westinghouse) Topical Report (TR) CENPD-132 Supplement 4.P-A, Addendum 1-P, "Calculative Methods for the CE [Combustion Engineering] Nuclear Power Large Break LOCA Evaluation Model – Improvement to 1999 Large Break LOCA EM Steam Cooling Model for Less Than 1 in/sec Core Reflood)
7. "Calculative Methods for the ABB CE Small Break LOCA Evaluation Model" (CENPD-137-P, Supplement 2-P-A)
8. "CE 16 x 16 Next Generation Fuel, Core Reference Report," WCAP-16500-P and Final Safety Evaluation for Westinghouse Electric Company Topical Report, Revision 0

However, only the nuclear engineering (i.e., physics) methodologies (1 and 2 above) are actually used to explicitly establish the MTC. The safety analysis methodologies listed (3 through 7) simply confirm that acceptable consequences are achieved for the specified MTC. These methodologies have nothing to do with explicitly establishing the MTC. Likewise, methodology 8 is simply an overview document that describes the Westinghouse 16 x 16 NGF design and the NRC-approved methodologies used to evaluate that design. WCAP-16500-P is not itself a methodology per se. Rather, it is a roadmap to the methodologies applicable to that fuel design. The specified topical report has nothing to do with explicitly establishing the MTC. WCAP-16500-P is included because NRC SE Limitation Number 9 requires its inclusion in the COLR. (Reference 3)

A review of the non-CE COLRs confirmed what had been observed when reviewing the SONGS and PVNGS COLR information. There is a mix of how the COLR presentation

format is handled. For example, neither Beaver Valley nor Callaway link the COLR parameters and methodologies while both Seabrook and Turkey Point do link the COLR parameters and methodologies. There is not an existing standard format for the COLR.

To reduce the amount of potential confusion, Waterford 3 is deleting the link between the COLR parameter and the methodologies.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory requirements/Criteria

There are three regulatory documents that relate to plant TSs and the COLR. These include:

1. 10 CFR 50.36, "Technical Specifications"
2. Generic Letter (GL) 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications"
3. NUREG-1432, Revision 3, "Standard Technical Specifications Combustion Engineering Plants"

The requirements / guidance provided by these documents are discussed in the following sections.

10 CFR 50.36, Technical Specifications

10 CFR 50.36 establishes the requirements for each licensee to create proposed TSs as part of their application for plant operation to be submitted for NRC review and approval. The TSs are derived from the analyses and evaluation included in the plant's safety analysis report (SAR) and amendments thereto. TSs must include the following categories of information:

1. Safety Limits, Limiting Safety System Settings, and Limiting Control Settings
2. Limiting Conditions of Operation
3. Surveillance Requirements
4. Design Features
5. Administrative Controls
6. Decommissioning
7. Initial Notification
8. Written Reports

10 CFR 50.36 does not explicitly address the use of the COLR. The regulation only speaks to the requirement to include the types of information identified in that section of the code. How the information is managed is left to other documents. In the case of the COLR, its use and management were introduced via GL 88-16.

GL 88-16, Removal of Cycle-Specific Parameter Limits from Technical Specifications

GL 88-16 is the vehicle through which the NRC promulgated its acceptance of a process to move cycle-specific parameter limits out of the TS Limiting Condition of Operation (LCO) section and relocated them in an administrative report so they could be processed, as necessary, pursuant to 10 CFR 50.59, "Changes, Tests and Experiments". Prior to the issuance of the GL, the method of controlling cycle-specific parameters, to assure conformance with 10 CFR 50.36, was to identify the specific value(s) determined to be within specified acceptance criteria (usually the limits of the safety analyses) using an approved calculation methodology and submitting these cycle-specific parameter values via a License Amendment Request (LAR) for NRC review and approval. This process had to be followed for each reload and possibly during a cycle if parameters changed. It was concluded that this formal submittal and review process did not represent an efficient use of licensee or NRC resources. GL 88-16 presented an alternative for the licensee to develop a COLR which would document the cycle-specific parameter values resulting from licensee calculations using NRC-approved methodologies. By strictly adhering to NRC-approved methodologies the need for licensee preparation of LARs and subsequent NRC review and approval was eliminated without increased risk to the public health and safety.

GL 88-16 provided guidance for preparing a LAR to modify then existing TSs to implement the new COLR option. To implement the use of a COLR, the licensee had to modify their existing TS by:

- a. Add the definition of a named formal report (i.e., the COLR) that includes the values of cycle-specific parameter limits that have been established using an NRC-approved methodology and consistent with all applicable limits of the safety analysis.
- b. Add an administrative reporting requirement to submit the formal report on cycle-specific parameter limits to the commission for information.
- c. Modify the individual TSs to note that cycle-specific parameters shall be maintained within the limits provided in the defined formal report.

The GL does not identify any cycle-specific parameters. This is left to the individual licensee. However, the NRC guidance provided in the NUREG reports for the various vendors' standard TSs does offer a representative list of cycle-specific parameters. This is discussed below.

NUREG-1432, Revision 3, "Standard Technical Specifications Combustion Engineering Plants"

NUREG-1432, Revision 3.1 documents the current standard TSs for CE designed NSSS plants. Although NUREG-1432 does not identify any TS COLR topical report methodology references, since these are plant specific, it does provide the outline for all of the elements discussed by the NRC in GL 88-16 and needed for COLR implementation. The NUREG does however suggest cycle-specific parameters for control via the COLR.

In the TS Administrative Controls section, NUREG-1432 places the TS COLR listing of NRC-approved methodologies in TS Section 5.6.5, and notes that licensees should:

Identify the Topical Report(s) by number and title or identify the staff Safety Evaluation Report for a plant specific methodology by NRC letter and date. The COLR will contain the complete identification for each of the TS referenced topical reports used to prepare the COLR (i.e., report number, title, revision, date, and any supplements).

This guidance indicates that the TS COLR listing of NRC-approved methodologies need only identify top level methodology topical reports by number and title. That is, issue dates and revision levels need not be provided. It then goes on to indicate that the COLR itself should contain the "complete" identification for each of the TS referenced topical reports implying that the issue dates and revision levels should be specified.

Entergy first implemented the use of the COLR for Waterford 3 in 1995 (Reference 4). At that time, the tie between the parameter in the COLR and the TS listed methodology was added. This was done due to the then current NRC approval of other facilities TS LAR to use the COLR and the informal request of the NRC reviewer. The current COLR is for Cycle 16, Revision 0. The tie between the COLR parameters and the NRC-approved methodology has been maintained to date (Reference 5).

The definition of a COLR in the existing Waterford 3 TS is essentially the same as that provided in NUREG-1432. A comparison of the COLR parameters identified in NUREG-1432 along with the parameters identified in the latest revisions of the COLRs for W3, ANO-2, SONGS and PVNGS demonstrates that except for a few plant-specific parameters, there is a good correlation between all the plants and the NUREG with respect to parameters placed in the COLR. It is then concluded that the Waterford 3 implementation of the COLR is consistent with others in the industry as well as with the NRC guidance in NUREG-1432. No change is necessary with regard to the COLR parameters selected.

Conclusions

With respect to implementation and material content, the Waterford 3 TS 6.9.1.11.1 listing of NRC-approved methodologies and COLR are consistent with the information requirements of NRC regulations and guidance documents. They are similar in content and presentation to other CE NSSS design plants using 16 x 16 fuel and which have digital protection systems. There are, however, two notable shortcomings in Waterford 3 TS 6.9.1.11.1 listing of NRC-approved methodologies and COLR. Specifically, the document retains references to methodologies that are not used to establish operating limits and the detailed methodology reference record in the COLRs is incomplete for some methodologies. An additional observation done at NRC request was that there are ties from each methodology listed to a COLR parameter. This approach does not appear to have been adopted in a uniform manner by other licensees. This cross-referencing is not required by regulation or regulatory guidance.

This submittal addresses the shortcomings identified above and will delete the cross-referencing between methodologies and COLR parameters. These proposed changes are being made to streamline and "clean up" the TS listing of NRC-approved methodologies used in developing the COLR.

In conclusion, Entergy has determined that the proposed changes do not require any exemptions or relief from regulatory requirements, other than the TS, and does not affect conformance with any GDC differently than described in the UFSAR.

5.2 No Significant Hazards Consideration

The proposed change will modify the Waterford Steam Electric Station, Unit 3 (Waterford 3) Technical Specification (TS) related to the analytical methods that will be used to confirm the safety of core operating limits by:

1. Deleting the parenthetical COLR parameter-to-methodology cross-references
2. Deleting the reference to the CESEC methodology (method number 6 in TS 6.9.1.11.1.6)
3. Deleting the reference to a supplement to a Topical Report that is already listed in the TS (CENPD-132, Supplement 4-P-A, Addendum 1-P, method number 19 in TS 6.9.1.11.1.19)
4. Correcting the reference to the CENTS methodology (change to the current Westinghouse topical report title and number, method number 9 to TS 6.9.1.11.1.9)

This submittal consolidates and organizes the number of methodologies used to determine the Waterford 3 COLR limits. The proposed changes are consistent with the guidance provided in GL 88-16.

Entergy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed changes to the list of NRC-approved methodologies listed in TS 6.9.1.11.1 are administrative in nature and have no impact on any plant configuration or system performance relied upon to mitigate the consequences of an accident. Changes to the calculated core operating limits may only be made using NRC-approved methodologies, must be consistent with all applicable safety analysis limits, and are controlled by the 10 CFR 50.59 process.

The proposed changes will minimize and clarify the listing of the NRC-approved methodologies that are currently being used in the Waterford 3 core designs and the determination of the operating limits for those cores.

Assumptions used for accident initiators and/or safety analysis acceptance criteria are not altered by the proposed changes.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed changes to the list of topical reports used to determine the operating limits has no impact on any plant configurations or on system performance that is relied upon to mitigate the consequences of an accident. These changes are administrative in nature and do not result in a change to the physical plant or to the modes of operation defined in the facility license.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed changes do not amend the cycle specific parameter limits located in the COLR from the values presently required by the TS. The individual specifications continue to require operation of the plant within the bounds of the limits specified in COLR.

The proposed changes to the list of analytical methods referenced in the COLR are administrative in nature.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

6.0 ENVIRONMENTAL CONSIDERATIONS

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Entergy Letter to NRC dated August 2, 2007, "License Amendment Request to Revise NPF-38-271 to Support Next Generation Fuel" (W3F1-2007-0037)
2. Entergy Letter to NRC dated March 10, 2008, "Supplement 2 RAI Response to Amendment Request NPF-38-271 to Support Next Generation Fuel" (W3F1-2008-0021)
3. NRC Letter to Westinghouse dated July 30, 2007, "Final Safety Evaluation for Westinghouse Electric Company Topical Report, WCAP-16500-P, Revision 0," (TAC No. MD0560)
4. NRC Letter to Waterford 3 dated March 1, 1995, "Issuance of Amendment No. 102 to facility operating license NPF-38 – Waterford Steam Electric Station, Unit 3," (TAC No. M90204)
5. Entergy Letter to NRC dated May 20, 2008, "Core Operating Limits Report – Cycle 16 Revision 0" (W3F1-2008-0041)

Attachment 2

W3F1-2009-0017

Proposed Technical Specification Changes (mark-up)

ADMINISTRATIVE CONTROLS

INDUSTRIAL SURVEY OF TOXIC OR HAZARDOUS CHEMICALS REPORT

6.9.1.9 Surveys and analyses of major industries in the vicinity of Waterford 3 which could have significant inventories of toxic chemicals onsite to determine impact on safety shall be performed and submitted to the Commission at least once every 4 years.

6.9.1.10 A survey of major pipelines (≥ 4 inches) within a 2-mile radius of Waterford 3, which contain explosive or flammable materials and may represent a hazard to Waterford 3, including scaled engineering drawings or maps which indicate the pipeline locations, shall be performed and submitted to the Commission at least once every 4 years.

CORE OPERATING LIMITS REPORT COLR

6.9.1.11 Core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT prior to each reload cycle or any remaining part of a reload cycle. *INSERT*

6.9.1.11.1 The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC as follows:

- 1) "The ROCS and DIT Computer Codes for Nuclear Design," CENPD-266-P-A, and "C-E Methodology for Core Designs Containing Gadolinia-Urania Burnable Absorber," CENPD-275-P-A. (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.3 for MTC, 3.1.3.6 for Regulating and group P CEA Insertion Limits, 3.1.2.9 Boron Dilution (Calculation of CBC & IBW), and 3.9.1 Boron Concentration).
- 2) "C-E Method for Control Element Assembly Ejection Analysis," CENPD-0190-A. (Methodology for Specification 3.1.3.6 for Regulating and group P CEA Insertion Limits and 3.2.3 for Azimuthal Power Tilt).
- 3) "Modified Statistical Combination of Uncertainties" CEN-356(V)-P-A. (Methodology for Specification 3.2.4 for DNBR Margin and 3.2.7 for ASI).
- 4) "Calculative Methods for the C-E Large Break LOCA Calculation Model For The Analysis of C-E and W Designed NSSS," CENPD-132, Supplement 3-P-A. (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt and 3.2.7 for ASI).
- 5) "Calculative Methods for the ABB CE Small Break LOCA Evaluation Model," CENPD-137-P, Supplement 2-P-A. (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt and 3.2.7 for ASI).

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ADMINISTRATIVE CONTROLS

CORE OPERATING LIMITS REPORT COLR (Continued)

6) "CESEC - Digital Simulation for a Combustion Engineering Nuclear Steam Supply System," (CE letter LD-82-001 and NRC SE to CE dated April 3, 1984). (Methodology for Specification 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.3 for MTC, 3.1.3.1 for Movable Control Assemblies - CEA Position, 3.1.3.6 for Regulating and group P CEA Insertion Limits, and 3.2.3 for Azimuthal Power Tilt).

7) "Qualification of Reactor Physics Methods for the Pressurized Water Reactors of the Entergy System," ENEAD-01-P. (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.3 for MTC, 3.1.3.6 for Regulating and group P CEA Insertion Limits, 3.1.2.9 Boron Dilution (Calculation of CBC & IBW), and 3.9.1 Boron Concentration).

8) "Fuel Rod Maximum Allowable Gas Pressure," CEN-372-P-A. (Methodology for Specification 3.2.1, Linear Heat Rate).

9) "Technical Description Manual for the CENTS Code," WCAP-15996-P-A. (Methodology for Specification 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.3 for MTC, 3.1.3.1 for Movable Control Assemblies - CEA Position, 3.1.3.6 for Regulating and group P CEA Insertion Limits, and 3.2.3 for Azimuthal Power Tilt).

10) "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model," CENPD-132, Supplement 4-P-A. (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt and 3.2.7 for ASI).

11) "Implementation of ZIRLO Material Cladding in CE Nuclear Power Fuel Assembly Designs," CENPD-404-P-A (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

12) "Qualification of the PHOENIX-P/ANC Nuclear Design System For Pressurized Water Reactor Cores," WCAP-14596-P-A: "ANC: A Westinghouse Advanced Nodal Computer Code," WCAP-10965-P-A; and "ANC: A Westinghouse Advanced Nodal Computer Code: Enhancements to ANC Rod Power Recovery," WCAP-10965-P-A Addendum 1. (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.3 for MTC, 3.1.3.6 for Regulating and group P CEA Insertion Limits, 3.1.2.9 Boron Dilution (Calculation of CBC & IBW), and 3.9.1 Boron Concentration).

13) "Qualification of the Two-Dimensional Transport Code PARAGON," WCAP-16045-P-A (Methodology for Specifications 3.1.1.1 and 3.1.1.2 for Shutdown Margins, 3.1.1.3 for MTC, 3.1.3.6 for Regulating and group P CEA Insertion Limits, 3.1.2.9 Boron Dilution (Calculation of CBC & IBW), and 3.9.1 Boron Concentration).

14) "Implementation of Zirconium Diboride Burnable Absorber Coatings in CE Nuclear Power Fuel Assembly Designs," WCAP-16072-P-A (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, and 3.2.7 for ASI).

15) "CE 16 x 16 New Generation Fuel Core Reference Report," WCAP-16040-P and Final Safety Evaluation for Westinghouse Electric Company (Westinghouse) Final Report (TR-16040-P, Revision 0), CE (Combustion Engineering) 16 x 16 New Generation Fuel (Model) Core Reference Report. (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Tilt, 3.2.7 for ASI, and 3.2.4.d for ANSI margin) and 3.2.7 for ASI).

ADMINISTRATIVE CONTROLS

CORE OPERATING LIMITS REPORT COLR (Continued)

~~16) "Optimized ZIRLO" WCAP-12610-P-A and GENPD-404-P-A Addendum 1-A. (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Lim, and 3.2.7 for ASH).~~

~~17) "Westinghouse Correlations WSSV and WSSV-T for Predicting Critical Heat Flux in Rod Bundles with Side-Supported Mixing Vanes." WCAP-15523-P-A and Final Safety Evaluation for Westinghouse Electric Company (Westinghouse) Topical Report (TR) WCAP-15523-P. "Westinghouse Correlations WSSV and WSSV-T for Predicting Critical Heat Flux in Rod Bundles with Side-Supported Mixing Vanes." (Methodology for Specifications 3.2.4 b, 3.2.4 c, and 3.2.4 d for DNBR Margin).~~

~~18) "ASIS Critical Heat Flux Correlations for PWR Fuel." GENPD-357-P-A (Methodology for Specification 3.2.4 b, 3.2.4 c, and 3.2.4 d for DNBR Margin and 3.2.7 for ASH).~~

~~19) "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model - Improvement to 1999 Large Break LOCA EM Steam Cooling Model for Less Than 1 in/sec Core Reflood." GENPD-132, Supplement 4-P-A, Addendum 1-P and Final Safety Evaluation for Westinghouse Electric Company (Westinghouse) Topical Report (TR) GENPD-132 Supplement 4-P-A, Addendum 1-P. "Calculative Methods for the CE [Construction Engineering] Nuclear Power Large Break LOCA Evaluation Model - Improvement to 1999 Large Break LOCA EM Steam Cooling Model for Less Than 1 in/sec Core Reflood (Methodology for Specification 3.1.1.3 for MTC, 3.2.1 for Linear Heat Rate, 3.2.3 for Azimuthal Power Lim, and 3.2.7 for ASH).~~

6.9.1.11.2 The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

6.9.1.11.3 The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance, for each reload cycle, to the NRC

SPECIAL REPORTS

6.9.2 Special reports shall be submitted in accordance with 10 CFR 50.4 within the time period specified for each report.

6.10 Not Used

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or indirectly any control over (i) the facility, (ii) power or energy produced by the facility, or (iii) the licensees of the facility. Further, any rights acquired under this authorization may be exercised only in compliance with and subject to the requirements and restrictions of this operating license, the Atomic Energy Act of 1954, as amended, and the NRC's regulations. For purposes of this condition, the limitations of 10 CFR 50.81, as now in effect and as they may be subsequently amended, are fully applicable to the equity investors and any successors in interest to the equity investors, as long as the license for the facility remains in effect.

- (b) Entergy Louisiana, LLC (or its designee) to notify the NRC in writing prior to any change in (i) the terms or conditions of any lease agreements executed as part of the above authorized financial transactions, (ii) any facility operating agreement involving a licensee that is in effect now or will be in effect in the future, or (iii) the existing property insurance coverages for the facility, that would materially alter the representations and conditions, set forth in the staff's Safety Evaluation enclosed to the NRC letter dated September 18, 1989. In addition, Entergy Louisiana, LLC or its designee is required to notify the NRC of any action by equity investors or successors in interest to Entergy Louisiana, LLC that may have an effect on the operation of the facility.

- C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter 1 and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

1. Maximum Power Level

EOI is authorized to operate the facility at reactor core power levels not in excess of 3716 megawatts thermal (100% power) in accordance with the conditions specified herein.

2. Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. ~~4-77~~; and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

AMENDMENT NO. ~~4-77~~ |

INSERT 1.

for the following:

- 3.1.1.1 SHUTDOWN MARGIN – ANY CEA WITHDRAWN
- 3.1.1.2 SHUTDOWN MARGIN – ALL CEAS FULLY INSERTED
- 3.1.1.3 MODERATOR TEMPERATURE COEFFICIENT
- 3.1.2.9 BORON DILUTION
- 3.1.3.1 CEA POSITION
- 3.1.3.6 REGULATING AND GROUP P CEA INSERTION LIMITS
- 3.2.1 LINEAR HEAT RATE
- 3.2.3 AZIMUTHAL POER TILT - T_q
- 3.2.4 DNBR MARGIN
- 3.2.7 AXIAL SHAPE INDEX
- 3.6.1.5 AIR TEMPERATURE, CONTAINMENT (Linear Heat Rate, 3.2.1)
- 3.9.1 BORON CONCENTRATION

Insert 2

Nuclear Engineering Methodologies

1. a) "Qualification of the PHOENIX-P / ANC Nuclear Design System for Pressurized Water Reactor Cores," WCAP-11596-P-A, June 1988
- b) "ANC: A Westinghouse Advanced Nodal Computer Code," WCAP-10965-P-A, September 1986
- c) "ANC: A Westinghouse Advanced Nodal Computer Code; Enhancements to ANC Rod Power Recovery," WCAP-10965-P-A Addendum 1, April 1989
2. "Qualification of the Two-Dimensional Transport Code PARAGON," WCAP-16045P-A, August 2004
3. "Implementation of Zirconium Diboride Burnable Absorber Coatings in CE Nuclear Power Fuel Assembly Designs," WCAP-16072-P-A, Revision 0, August 2004

Fuel Design / Thermal Hydraulics Methodologies

4. "Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Assembly Designs," CENPD-404-P-A, Rev. 0, November 2001
5. "CE 16 x 16 Next Generation Fuel Core Reference Report," WCAP-16500-P-A, Rev. 0, August 2007
6. "Optimized ZIRLO™," WCAP-12610-P-A & CENPD-404-P-A Addendum 1-A, July 2006
7. "Westinghouse Correlations WSSV and WSSV-T for Predicting Critical Heat Flux in Rod Bundles with Side-Supported Mixing Vanes," WCAP-16523-P-A, Rev. 0, August 2007
8. "ABB Critical Heat Flux Correlations for PWR Fuel," CENPD-387-P-A, Rev. 0, May 2000

Loss-of-Coolant Accident (LOCA) Methodologies

9. "Calculative Methods for the C-E Large Break LOCA Evaluation Model", CENPD-132P, Rev. 0, August 1974
10. "Calculational Methods for the C-E Large Break LOCA Evaluation Model", CENPD-132P, Supplement 1, February 1975
11. Letter, O. D. Parr (NRC) to F. M. Stern (CE), "NRC Staff Review of the Combustion Engineering ECCS Evaluation Model", June 13, 1975 (*NRC approval for items 9, 10 and 17 methodologies*)
12. "Calculational Methods for the C-E Large Break LOCA Evaluation Model", CENPD-132, Supplement 2, July 1975
13. Letter, O. D. Parr (NRC) to A. E. Scherer (CE), "NRC Staff Review of the Proposed

Insert 2 (Continued)

Combustion Engineering ECCS Evaluation Model Changes", December 9, 1975 (*NRC approval for item 12 methodology*)

14. "Calculative Methods for the C-E Large Break LOCA Evaluation Model For The Analysis of C-E and W Designed NSSS," CENPD-132, Supplement 3-P-A, June 1985
15. "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model," CENPD-132, Supplement 4-P-A, March 2001
16. "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model – Improvement to 1999 Large Break LOCA EM Steam Cooling Model for Less Than 1 in/sec Core Reflood", CENPD-132, Supplement 4-P-A, Addendum 1-P-A, August 2007
17. "Calculative Methods for the C-E Small Break LOCA Evaluation Model", CENPD-137P, August 1974
18. "Calculative Methods for the C-E Small Break LOCA Evaluation Model", CENPD-137, Supplement 1-P, January 1977
19. Letter, K. Kniel (NRC) to A. E. Scherer (CE), "Evaluation of Topical Report CENPD-133, Suppl. 3-P and CENPD-137, Suppl. 1-P", Sep. 27, 1977 (*NRC approval for item 18 methodology*)
20. "Calculative Methods for the ABB CE Small Break LOCA Evaluation Model," CENPD-137, Supplement 2-P-A, April 1998

Other Design Basis Transient (non-LOCA) Methodologies

21. "C-E Method for Control Element Assembly Ejection Analysis," CENPD-190-A, Rev. 0, January 1976
22. "Technical Description Manual for the CENTS Code," WCAP-15996-P-A, Rev. 1, March 2005

Setpoint Methodologies

23. "Modified Statistical Combination of Uncertainties" CEN-356(V)-P-A, Revision 01-P-A, May 1988
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