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REF: 10CFR50.90
10CFR2.390

CP-201400503
TXX-14053

April 17, 2014

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

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT (CPNPP)
DOCKET NOS. 50-445 AND 50-446
LICENSE AMENDMENT REQUEST (LAR) 13-01 SPENT FUEL POOL CRITICALITY
ANALYSIS, RESPONSE TO REQUESTS FOR ADDITIONAL INFORMATION
(TAC NOS. MF1365 AND MF1366)

- REFERENCE:**
1. Letter logged TXX-13045, dated March 28, 2013, License Amendment Request (LAR) 13-01, Revision to Technical Specifications 3.7.16, "FUEL STORAGE POOL BORON CONCENTRATION," 3.7.17, "SPENT FUEL ASSEMBLY STORAGE," 4.3, "FUEL STORAGE," and 5.5 "PROGRAMS AND MANUALS" (ML 13095A023)
 2. Letter logged TXX-13109, dated July 16, 2013, "Supplemental Information supporting LAR 13-01, Spent Fuel Pool Criticality Analysis" (ML 13205A056)
 3. Letter logged TXX-13169, dated November 26, 2013, RE: CPNPP response to Requests for Additional Information for LAR 13-01, Spent Fuel Pool Criticality Analysis
 4. Letter logged TXX-13182 dated December 17, 2013, RE: CPNPP response to Requests for Additional Information for LAR 13-01, Spent Fuel Pool Criticality Analysis
 5. Letter logged TXX-14008 dated January 16, 2014, RE: CPNPP response to Requests for Additional Information for LAR 13-01, Spent Fuel Pool Criticality Analysis
 6. Letter dated February 27, 2014, from Balwant Singal of the NRC to Rafael Flores of Luminant Power, RE: Request for Additional Information - License Amendment Request 13-01 (TACs MF1365 and MF1366)
 7. Email dated April 7, 2014, from Balwant Singal of the NRC to Timothy Hope of Luminant Power, RE: Request for Additional Information - License Amendment Request 13-01 (TACs MF1365 and MF1366)

Dear Sir or Madam:

In March 2013, Luminant Generation Company LLC (Luminant Power) submitted a License Amendment Request (LAR) 13-01 (Reference 1, as supplemented by Reference 2 and the response to Requests for Additional Information in References 3, 4, and 5) to the NRC for Facility Operating License Nos. NPF-87 and NPF-89 for Comanche Peak Nuclear Power Plant (CPNPP), Units 1 and 2, respectively. This LAR proposes a change to the CPNPP, Units 1 and 2, Technical Specifications based on an updated criticality analysis methodology for the spent fuel pools.

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Per References 6 and 7, the NRC staff has requested additional information (RAI), regarding the LAR, be submitted in order to complete its review. Attachment 1 to this letter provides Luminant Power's response to the RAIs regarding software quality control in Reference 7. Attachment 2 to this letter is the proprietary version of Luminant Power's response to the RAIs regarding spent fuel pool configuration interfaces in Reference 6. Attachment 3 provides a non-proprietary version of Luminant Power's response to the RAIs in Reference 6.

Also enclosed is the Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-14-3944, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice.

As Attachment 2 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an affidavit signed by Westinghouse, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse affidavit should reference CAW-14-3944 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

In accordance with 10CFR50.91(b), Luminant Power is providing the State of Texas with a copy of this proposed amendment.

Attachment 1 of Reference 1, Description and Assessment, which addresses the no significance hazards consideration standards set forth in 10CFR50.92, remains valid and does not require change.

This communication contains no new commitments regarding Comanche Peak Units 1 and 2.

Should you have any questions, please contact Mr. J. D. Seawright at (254) 897-0140.

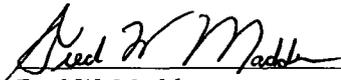
I state under penalty of perjury that the foregoing is true and correct.

Executed on April 17, 2014.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

By: 
Fred W. Madden
Director, External Affairs

- Attachments:
1. Comanche Peak Responses to LAR 13-01 Request for Additional Information (RAI) Regarding Software Quality Control (Non-Proprietary)
 2. Comanche Peak Responses to LAR 13-01 Request for Additional Information (RAI) Regarding SFP Configuration Interfaces (Proprietary Version)
 3. Comanche Peak Responses to LAR 13-01 Request for Additional Information (RAI) Regarding SFP Configuration Interfaces (Non- Proprietary Version)

Enclosure: Westinghouse Application for Withholding Proprietary Information from Public Disclosure CAW-14-3944, accompanying Affidavit, Proprietary Information Notice, and Copyright Notice

c - Marc L. Dapas, Region IV (w/o Attachment 2)
Balwant K. Singal, NRR
Resident Inspectors, Comanche Peak (w/o Attachment 2)

Mr. Robert Free (w/o Attachment 2)
Environmental Monitoring & Emergency Response Manager
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Attachment 1 to TXX-14053

**Comanche Peak Responses to LAR 13-01 Request for
Additional Information (RAI) Regarding Software Quality Control
(Non-Proprietary)**

By letter dated March 28, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13095A023), Luminant Generation Company LLC (Luminant) requested for a license amendment request to revise Technical Specifications (TSs) 3.7.16, 3.7.17, 4.3, and 5.5 for Comanche Peak Nuclear Power Plant (CPNPP), Units 1 and 2. Enclosure 1, "Comanche Peak Nuclear Power Plant Spent Fuel Pool (SFP) Configuration Controls," discusses a new software and improved administrative controls that are proposed to "ensure that the increased complexity [of the Region II storage configurations] does not result in an increased risk of a TS 3.7.17 non-compliance due to an error made during fuel movement planning." Page 3 of 15 of Enclosure 1 contains the "Configuration Confirmation Software Functionality" section, which states that a Quality Assurance (QA) controlled software program is proposed to ensure that the proposed limitations of TS 3.7.17 are satisfied for any fuel movement plan. Additionally, this software will interface with two other QA software programs (i.e., ShuffleWorks and TARPIT) at CPNPP.

1. **Item 6.a of the "Software Features" section states that CPNPP software quality assurance program requires software features independently tested to ensure accuracy and completeness, reliability, functionality, and ease of use prior to approval. Item 6.c states that CPNPP software quality assurance program requires independent testing of any changes to the software prior to approval of the software revision. The U.S. Nuclear Regulatory Commission (NRC) staff would like to request for the following additional information regarding the development of the proposed software:**

- a. **Please provide background information on the proposed software, including: name/version number, developer/vendor, operational experience and performance history. Additionally, please describe where the software will be installed and if it's in the same computer where Shuffleworks and TARPIT are installed.**

Response to 1.a.

Current TS 3.7.17 surveillance activities at CPNPP are performed using the HDSL software (High Density Storage Limits), which is the QA software program which calculates the allowable storage configurations of the current CPNPP TS 3.7.17 limits. The HDSL software does not evaluate spent fuel pool configurations or fuel move sequences, but generates an output spreadsheet which contains the allowed storage configuration for each fuel assembly based on manually input values of burnup and enrichment. Since the user must manually create input files and manually review the fuel move plans to ensure fuel movement and final configurations are compliant with the Technical Specification requirements, there is a risk of a human performance error which could result in fuel movement which is not compliant with TS 3.7.17 limits.

HDSL will be retired as part of the transition to the revised TS 3.7.17 limits. The software which has been created to replace HDSL and provide the functionality described in Enclosure 1 of the License Amendment Request (LAR) is titled PETRIFIED (Pool Evaluator for TechSpec Regions Integrated with Fuel Inventory Electronic Databases), and once implemented, the version will be Revision 0. The software was developed onsite within the Core Performance Engineering group.

Although the testing phase of software development is completed, the software has not yet been implemented, due to the fact that the Technical Specification limits which are programmed into the software do not represent the current CPNPP storage limitations. Therefore, there is no operational experience or performance history associated with this software.

The implementation of PETRIFIED will result in many improvements related to automated verification of fuel movement plans, when compared to the process currently used and the HDSL software. These improvements ensure that the increased complexity of the TS 3.7.17 limits do not result in an increased risk of a non-compliance due to an error made during fuel movement planning.

The software will be installed and executed from the same CPNPP shared network drive as the TARPIT software, and on the same network drive where the ShuffleWorks files will be maintained. ShuffleWorks is typically installed and executed from a local drive on the user's computer, but all data files are saved on the shared network drive.

b. Please describe the industry quality standards used during development and testing of the software.

Response to 1.b.

The PETRIFIED software was developed and tested per the quality standards of the CPNPP Nuclear Software Quality Assurance Program, which is described in the CPNPP Quality Assurance Manual Appendix E.

The implementing station procedure was developed based on the industry standard ASME NQA-1-1994, Subpart 2.7, "Quality Assurance Requirements of Computer Software for Nuclear Facility Applications". Core Performance software control procedure is titled NUC-006, "Control of Computer Programs", and satisfies the requirements of the Station Level procedure.

c. Please describe the requirements of the proposed software and how the implementation of these requirements have been verified and validated independently.

Response to 1.c.

The primary functions which are required to be performed by the software are described as "Software Features" in Enclosure 1 of LAR-13-01. These requirements include the categorization of fuel assemblies and ensuring that the limitations of proposed TS 3.7.17 are properly checked for input SFP configurations and fuel move sequences.

During development, a detailed listing of all software functionality was created, which includes the full scope of the software requirements and other functionality not described in the LAR, including details of output formatting, data review options, and planning features. Testing was performed per the Core Performance software control procedure to ensure the software requirements were met and that all other functionality works as designed.

- d. Please describe the types of testing (e.g., functional testing) that have been performed, and testing tools (e.g., a simulator tool) used on the proposed software. Additionally, please describe how errors introduced during software development are identified, documented, and corrected prior to releasing the software. If another software has been used to develop the proposed software, please describe how is it assured that there is no unused or unidentified functionality that can adversely affect the proposed software.**

Response to 1.d.

Per the Core Performance software control procedure, a test plan must include a complete and thorough exercise of all possible uses of the code, including documentation of the following attributes for each code function:

- The description of the function (provided by the software creator) is accurate and complete.
- The code functions as described, including satisfying any related procedural steps, and the code properly formats outputs.
- Any calculations have been verified using independent methods, such as other approved software, hand calculations, or spreadsheet calculations.
- The results have been verified for the full range of allowed inputs, including all allowable sources of input data.
- Any default inputs or assumptions are appropriate and do not potentially mislead the user.
- Human Factors have been properly incorporated into the software. The code properly handles common input/user errors without crashing or giving inaccurate results. The code, when needed, limits the user input to reasonable values.

For the PETRIFIED software, the testing was performed on each of the “software functions” documented by the developer, using a variety of methods to satisfy the above requirements. The test plan included testing for 38 functions in total, ranging from simple tasks such as creating a Portable Document Format (PDF) file from a spent fuel pool map, to much more complicated tasks such as evaluating a spent fuel pool configuration for compliance. For some of the key functions, a brief description of the testing performed is provided below.

- One PETRIFIED function determines a fuel assembly’s ‘Category’ (from 1 to 6) based on Fuel Group, burnup, enrichment, and decay time. This required function is described in LAR-13-01, Enclosure 1, Software Feature 1.a.
 - To test this function, a spreadsheet was created by the Test Engineer to independently calculate the burnup limits for each Fuel Category based on input fuel parameters and the proposed TS 3.7.17 limits.
 - The results from this spreadsheet were used to verify the PETRIFIED results for every fuel assembly in the CPNPP inventory as of June 2013, as well as calculations for 5 and 10 years in the future.
 - To ensure the code will properly calculate limits for fuel with parameters outside the current CPNPP fuel inventory, all values from the proposed

Technical Specification Limits were independently verified to be correctly programmed into the software.

- One of the key subroutines in the software is the 'Check_Locations' subroutine, which determines the acceptability of a single spent fuel pool location by comparing the four 2-by-2 Arrays which include this location to the allowed arrays from the proposed Technical Specifications. This subroutine also ensures that fuel with fuel parameters outside of the Technical Specification tables are not stored in Region II, regardless of the Category and configuration (for example, enrichment > 5% or Fuel Group F1 decay time < 10 years). This required function is described in LAR-13-01, Enclosure 1, Software Feature 4.
 - To test this function, a series of simulated fuel movement plans were performed to create 127 "test arrays". The test cases included SAT and UNSAT cases, utilized all combinations of Fuel Groups and Categories, tested all TS 3.7.17 arrays and potential boundary scenarios, and triggered all potential failure "Rules" which were programmed into PETRIFIED.
 - This simulation was performed using the 'Trial Fuel Movement' software function, which allows the user to immediately see the results of proposed fuel movement plans by simply clicking on an on-screen SFP map to change the location of fuel assemblies (note that enabling this function disables the ability to perform a SR 3.7.17.1 surveillance report, since the displayed configuration will no longer represent the ShuffleWorks files which were used as input).
 - The array acceptability results determined by PETRIFIED (SAT or UNSAT) were manually verified for each test case.
 - Test assemblies were loaded into the TARPIT and ShuffleWorks files to simulate fuel with parameters outside the Technical Specification tables. It was verified that these assemblies would trigger a failure regardless of category or configuration.
- Another key function is the verification of planned fuel moves for TS 3.7.17 compliance. This function utilizes the Check_Locations subroutine at any location which could be impacted, for any assembly moved into a Region II location in the sequence. This required function is described in LAR-13-01, Enclosure 1, Software Feature 3.a.
 - This function was tested using simulation, by manually manipulating test sequence files and verifying that expected failures of TS 3.7.17 compliance occurred.

The individual responsible for developing and implementing the test plan is a fully qualified member of the Core Performance Engineering group, and is qualified to perform SR 3.7.17.1 surveillance and fuel move planning activities.

The goal of the testing phase is to identify any software errors which were introduced during the development. Per the Core Performance software control program, if initial

test plan results are unsatisfactory due to errors, then modifications should be made to the code, and any affected tests must be reperformed. During the testing of PETRIFIED, a total of 60 issues were documented in the test plan, resolved, and any testing which was affected was reperformed. The vast majority of these issues did not impact the acceptability of the SR 3.7.17.1 surveillance report, but were minor software bugs, interface corrections, or human performance improvements.

One significant error which was identified and corrected during testing involved the failure to identify a violation regarding the boundary requirements of Array II-A when this array is stored in the corner of the spent fuel pool (adjacent to two walls). In this case, the boundary requirement (to be adjacent to Array II-B) applies in both the North-South direction as well as the East-West direction, but the software was only checking the interface in one direction.

No software, other than the programming language, was utilized to develop PETRIFIED, and the functionality listing was created by the software developer. The source code was created in its entirety on site, with the exception of a public domain screen capture subroutine which was implemented for printing the SFP maps. The source code for this subroutine was reviewed and is understood by the software developer, and does not interact with other software functions. This ensures that no unused or unidentified functionality will affect the software.

e. Please describe how the proposed software configuration is controlled and the measures taken to assure that the software used is always the latest approved version.

Response to 1.e.

The primary software configuration control is the fact that the software is not individually installed on the computers of users, but is installed in a specific location on the CPNPP network. This network location has restricted access and only a small group of individuals, including all members of Core Performance Engineering, have read/write access.

Each user will utilize the software using the same executable and support files, and when a revision is implemented, users will automatically utilize the current version. Per the Core Performance software control program, when a software revision occurs, any prior revisions of the code must be removed prior to installing the revised version on the shared network drive.

A separate PETRIFIED test location is available to test future software revisions, to ensure that temporary testing files do not impact the production location. Printed surveillance reports which are created using the test location include printed comments to inform the user that the surveillance was not created using the production files.

The procedure for performing the new SR 3.7.17.1 surveillance will require the user to verify the status of the database files which are used as inputs by comparing the file information to the approved file information. When fuel move plans are generated, the procedure will require verification that the ShuffleWorks files used in the fuel move plan are the same as the files utilized in the SR 3.7.17.1 surveillance.

2. **Item 1.b of the “Software Features” section states that “No input files need to be created to perform this determination, since the input data will be directly obtained from the TARPIT database.” Item 6.b states that CPNPP software quality assurance program requires station procedures control all input data files, and require independent review for any changes, including routine updates.**
- a. **Please explain if it is possible to create an input file. Additionally, please describe how the proposed software prevents the use of any input files not generated from ShuffleWorks and TARPIT.**

Response to 2.a.

The statement in Item 1.b regarding the lack of input file creation only implies that the user will not need to obtain the input data from various sources and format this data in a manner to create an input file for PETRIFIED. The input data consists of fuel information such as burnup, enrichment, decay time, Fuel Group, and storage location. The manual creation of an input file is required by the current HDSL software, and this process inherently has some level of risk for human performance errors which could impact the surveillance results.

The PETRIFIED code obtains fuel assembly information automatically and directly from the data source, without the need for the user to perform data manipulation (such as summing the burnup results for each cycle to obtain a final fuel assembly burnup) or formatting (such as organizing the data in a text file or spreadsheet to meet specific format requirements). For example, fuel assembly burnup is obtained directly from the TARPIT Delta_Burnup database, which is procedurally controlled, and is updated following each operating cycle. The Surveillance Report printed from PETRIFIED includes file information for the Delta_Burnup database, and the user is procedurally required to compare this file information to the most recently completed database update record.

Since PETRIFIED has no functionality for obtaining this information from alternate sources, such as a user created input file, it is not possible to use input which is not obtained directly from ShuffleWorks and TARPIT.

- b. **Please explain if the proposed software can modify or delete a TARPIT or Shuffleworks configuration file or sequence file, and if so, describe your measures to prevent unintended errors and problems from any such modification or deletion.**

Response to 2.b.

All TARPIT and ShuffleWorks data files, when accessed by the PETRIFIED software, are opened in a “Read Only” capacity, which prevents unintended changes to the support files. In the case of a catastrophic failure, backup copies of the database files and ShuffleWorks files are created with each update.

3. **Item 1.b of the “Proposed Procedural Controls and Limitations” section states that performance of Surveillance Requirement (SR) 3.7.17.1 using methods other than QA-controlled software will not be permitted. The NRC staff request for the**

following additional information regarding actions taken and behavior of the proposed software in case it were to fail.

a. Please explain what methods will be used to perform SR 3.7.17.1 in the case where the proposed software fails, or is not functioning properly.

Response to 3.a.

The procedure for performing SR 3.7.17.1 (which is not yet implemented) states “the calculations and verification of acceptable configurations must be performed by a QA software program (i.e. the Surveillance Report cannot be performed manually or generated by a non-QA tool or spreadsheet).” This procedural requirement reflects the statement in LAR-13-01 regarding restrictions for using methods other than QA-controlled software.

If the software fails, this procedural requirement will result in the inability to perform Region II surveillance activities (and therefore no fuel movement into or within Region II will be permitted) for some period of time. The issues will need to be corrected and QA testing of any software changes completed before the Surveillance could be performed again.

Note that CPNPP has not moved fuel into or within Region II since September 2012; therefore, no surveillances have been required for over 18 months. Region I racks provided sufficient capacity during that time. During this period, the PETRIFIED software was fully developed and tested. This experience demonstrates that the Region I storage capacity provides adequate fuel storage for the time necessary to update and test software.

b. Please describe how operators will be notified of a software failure of the proposed software.

Response to 3.b.

The Core Performance software control procedure requires notifications to the software users when an error is discovered, which is necessary to prevent any invalid outputs from being used for any quality-related or safety-related functions.

The users of PETRIFIED consist solely of the Core Performance Engineering group, since this group is solely responsible for performance of SR 3.7.17.1.

c. Please describe what occurs and what actions are pursued by your staff if the proposed software produces an incorrect or erroneous result?

Response to 3.c.

The Core Performance software control procedure includes a requirement to enter software failures into the CPNPP corrective action program. If an incorrect or erroneous result is discovered, the corrective action process will be used to evaluate Operability and determine the proper corrective actions. The corrective actions will be dependent upon the nature of the failure. If software changes are needed to ensure accuracy of surveillance reports, the changes will be tested per the software QA program and

implemented prior to performing further SR 3.7.17.1 surveillances. If it is determined that the error has resulted in a storage configuration which is non-compliant with LCO 3.7.17, the actions required by the Technical Specifications will be followed.

Although extensive testing has been performed to demonstrate the accuracy and reliability of PETRIFIED, it is possible that an undetected software error could result in a violation of the TS 3.7.17 limitations, which would be considered a misload accident. However, procedural administrative controls limit the type of software misload errors to those bounded by the analyzed cases in Section 5.7 of WCAP-17728-P Rev 1. Restrictions in Fuel Handling procedures, which are described in LAR-13-01, Enclosure 1, Section 2, ensure that an empty row is maintained around fresh fuel assemblies in Region II, and that solid 2x2 arrays (as allowed by Array II-A) are limited to spent fuel pool locations which are adjacent to the SFP wall. If following the steps of the fuel movement plan will result in a violation of these requirements, Fuel Handling procedures require that fuel movement must stop, regardless of the instructions provided by Core Performance Engineering or the SR 3.7.17.1 surveillance results.

Therefore, the most reactive configuration which could credibly be caused by an undetected error in PETRIFIED would be a non-compliant configuration involving a large number of fuel assemblies which have experienced only one cycle of operation. For example,

- If the PETRIFIED error results in fuel move plans which place a fresh fuel assembly adjacent to any other fuel, the fuel handling verification would stop the fuel movement.
- If the PETRIFIED error results in fuel move plans which place fuel in a 4-out-of-4 pattern in an area which is not adjacent to the SFP wall, the fuel handling verification would stop the fuel movement.
- If the PETRIFIED error results in fuel move plans which place once-burned Category 2 fuel into a 3-out-of-4 pattern similar to Array II-B (which would not comply with TS 3.7.17 limits), the fuel handling verification would NOT stop the fuel movement, and therefore this misload accident is credible.
- If the PETRIFIED error results in fuel move plans which place once-burned Category 2 fuel in a 4-out-of-4 pattern adjacent to the SFP wall similar to Array II-A (which would not comply with TS 3.7.17 limits), the fuel handling verification would NOT stop the fuel movement, therefore this accident is credible.

The credible accident configurations which could result due to a significant failure of the PETRIFIED code are bounded by the misload accident, because the reactivity of the resulting configuration would be significantly lower than the reactivity demonstrated in the Multiple Assembly Misload analysis, which is described in WCAP-17728-P Section 5.7.

Attachment 3 to TXX-14053

**Comanche Peak Responses to LAR 13-01 Requests for Additional
Information (RAI) regarding SFP Configuration Interfaces**

(Non-Proprietary Version)

1. WCAP-17728-P (Enclosure 2 to letter dated March 28, 2013) indicates that periodic boundary conditions are used for all storage array models in the x-y plane including Array 11-A. The NRC staff believes that using a periodic boundary condition for the x-direction would be inappropriate as it would be simulating a water/wall boundary condition for Array 11-B which is required to border Array 11-A. Please describe the boundary conditions were used in the Array II-A analysis for normal, accident, and interface conditions.

Response:

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Figure 1: [

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References:

1. WCAP-17728-P, Revision 1, "Comanche Peak Nuclear Power Plant Units 1 and 2 Spent Fuel Pool Criticality Safety Analysis," October 2013.

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2. Please describe how the interface conditions were modeled for all of the Region I and Region II interface calculations. Please also describe how many of each array were modeled in the x-y plane and what boundary conditions were used.

Response:

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Figure 1: Region I and Region II Interface Model (Not to Scale)

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3. It appears that the methodology used in WCAP-17728-P for addressing the interface between rack designs, between storage arrays within a rack design, and within a storage array itself are not consistent with the guidance in Interim Staff Guidance (ISG) DSS ISG-2010-01, "Staff Guidance Regarding the Nuclear Criticality Safety Analysis for Spent Fuel Pools" (ADAMS Accession No. ML110620086), which states, in part, that

Absent a determination of a set of biases and uncertainties specifically for the combined interface model, use of the maximum biases and uncertainties from the individual storage configurations should be acceptable in determining whether the keff of the combined interface model meets the regulatory requirements.

Please either revise the analysis to be consistent with DSS ISG-2010-01 or provide the justification for the methodology used in WCAP-17728-P, including the results of the analyses performed to support that methodology. Also, please include the analysis results for the Array II-A and Array I-A interface calculation.

Response:

In the spent fuel pool criticality analysis, each allowable storage array is evaluated to meet the applicable regulatory limits considering all relevant biases and uncertainties. [

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The ISG (DSS ISG-2010-01) suggests confirming interfaces are acceptable by selecting the most limiting biases and uncertainties from each of the arrays making up the interface if none has been explicitly calculated for the interface configuration. Because the target k_{eff} is defined by subtracting the biases and uncertainties associated with a storage array from the regulatory k_{eff} limit, combining the maximum target k_{eff} and maximum sum of biases and uncertainties mathematically cannot meet the regulatory k_{eff} limit. Therefore, to meet the regulatory limit, burnup requirements for all assemblies and storage arrays would need to be determined based on the maximum sum of biases and uncertainties of all storage arrays incorporated in the analysis.

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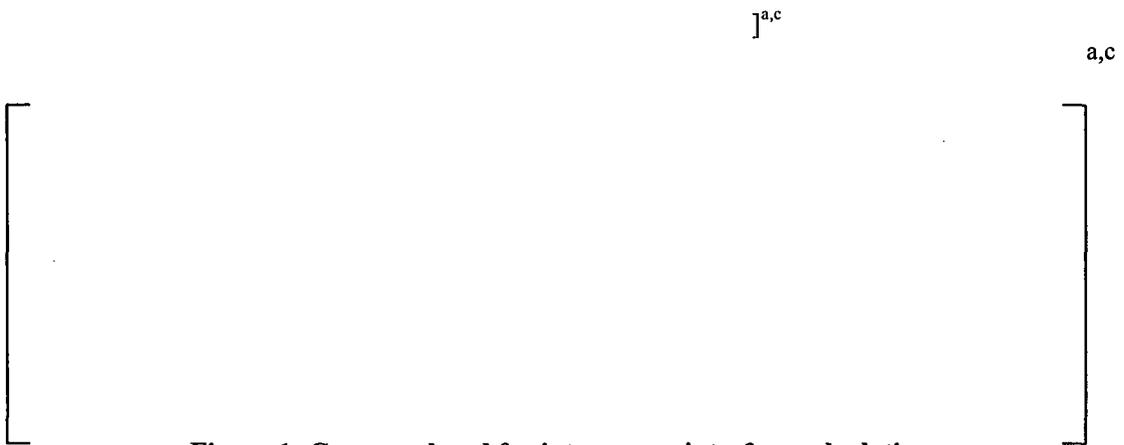


Figure 1: Cases analyzed for intra-array interface calculations

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Table 3-1: [

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Table 3-2: []^{a,c}

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Table 3-3: []^{a,c}

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References:

1. WCAP-17728-P, Revision 1, "Comanche Peak Nuclear Power Plant Units 1 and 2 Spent Fuel Pool Criticality Safety Analysis," October 2013.

4. WCAP-17728-P uses the FIGHTH code in the criticality safety analysis to determine the fuel assembly axial and radial temperature distribution used in the depletion analysis. Please clarify if FIGHTH is an NRC-approved code for use in safety-related applications? Also, please clarify if FIGHTH accounts for fuel thermal conductivity degradation?

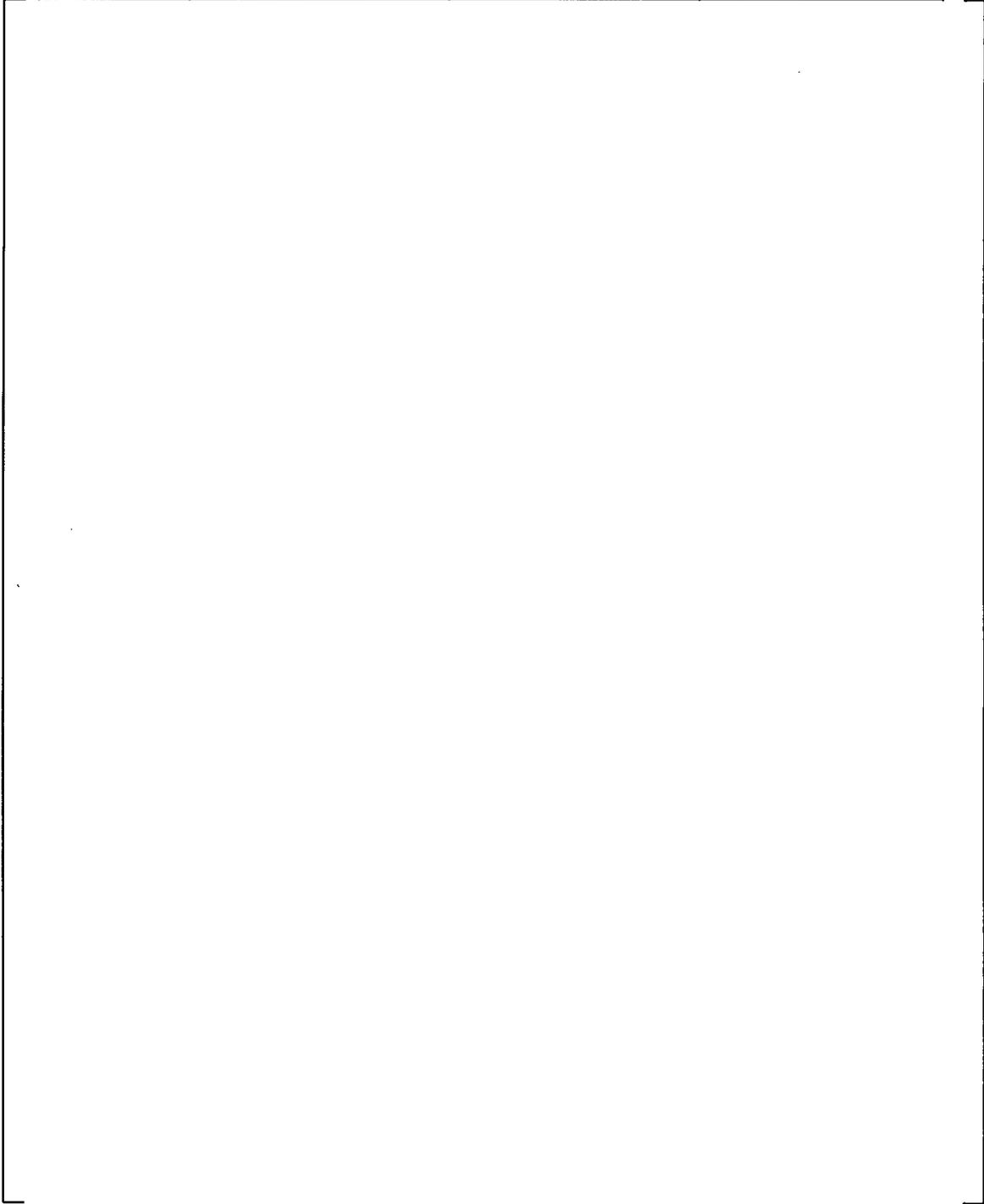
Response:

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Table 4-1: Reactivity Impact of Updated FIGTH Heat Transfer Model Including TCD

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References:

1. WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," August 2004.
2. WCAP-11596-P-A, "Qualification of the PHOENIX-P/ANS Nuclear Design System for Pressured Water Reactor Cores," June, 1988.
3. WCAP-17642-P, "Westinghouse Performance Analysis and Design Model (PAD5)," October 2013.
4. WCAP-17728-P, Revision 1, "Comanche Peak Nuclear Power Plant Units 1 and 2 Spent Fuel Pool Criticality Safety Analysis," October 2013.

Enclosure to TXX-14053

**Application For Withholding Proprietary
Information From Public Disclosure**

CAW-14-3944

**Proprietary Information Notice
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CAW-14-3944

April 10, 2014

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: CE-14-301, Attachment 1, "Westinghouse Suggested Responses to ML14058A089, NRC RAI for Comanche Peak Spent Fuel Pool LAR" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-14-3944 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by Luminant Generation Company LLC.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse Affidavit should reference CAW-14-3944, and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

Very truly yours,

A handwritten signature in black ink, appearing to read 'JAG' followed by a flourish and the word 'for'.

James A. Gresham, Manager

Regulatory Compliance

Enclosures

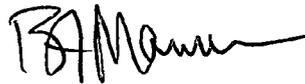
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COMMONWEALTH OF PENNSYLVANIA:

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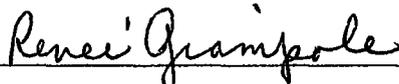
COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared Bradley F. Maurer, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

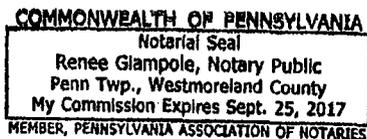


Bradley F. Maurer, Principal Engineer
Plant Licensing

Sworn to and subscribed before me
this 10th day of April 2014



Notary Public



- (1) I am Principal Engineer, Plant Licensing, in Engineering, Equipment and Major Projects, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
 - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
 - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

 - (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
 - (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
 - (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
 - (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
 - (f) It contains patentable ideas, for which patent protection may be desirable.
- (iii) There are sound policy reasons behind the Westinghouse system which include the following:
- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
 - (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
 - (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.
 - (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component

may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

- (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
 - (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.
- (v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in CE-14-301, Attachment 1, "Westinghouse Suggested Responses to ML14058A089, NRC RAI for Comanche Peak Spent Fuel Pool LAR" (Proprietary), for submittal to the Commission, being transmitted by Luminant Generation Company LLC letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with Luminant's request for NRC approval of WCAP-17728, Revision 1, and may be used only for that purpose.
- (a) This information is part of that which will enable Westinghouse to:
 - (i) Obtain NRC approval of WCAP-17728-P, Revision 1, "Comanche Peak Nuclear Power Plant Units 1 and 2 Spent Fuel Pool Criticality Safety Analysis."
 - (ii) Demonstrate the sub-criticality of the Comanche Peak spent fuel pools.

- (b) Further this information has substantial commercial value as follows:
- (i) Westinghouse plans to sell the use of the information to its customers for the purpose of demonstrating the sub-criticality of the spent fuel pool.
 - (ii) Westinghouse can sell support and defense of spent fuel pool criticality analysis.
 - (iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical evaluation justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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