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10 CFR 50.90

NRC 15-032
June 22, 2015

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

Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-53 and DPR-69
NRC Docket Nos. 50-317 and 50-318

Subject: Request for Additional Information Regarding the As-found Lift Tolerances for the Pressurizer Safety Valves License Amendment Request

References:
1. Letter from G. H. Gellrich (Exelon) to Document Control Desk (NRC), dated February 13, 2014, License Amendment: Request Pressurizer Safety Valve Technical Specification Revision
2. Letter from A. N. Chereskin (NRC) to G. H. Gellrich (Exelon), dated May 6, 2015, Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 - Request for Additional Information Regarding the As-found Lift Tolerances for the Pressurizer Safety Valves License Amendment Request (TAC Nos. MF3541 and MF3542)

In Reference 1, Calvert Cliffs Nuclear Power Plant, LLC requested an Amendment to its Renewed Operating License Nos. DPR-53 and DPR-69 with the submittal of the proposed changes to the Technical Specifications related to the as-found lift tolerances for the pressurizer safety valves. Reference 2 requested additional information regarding this amendment request. Attachment (1) provides the requested information. Attachment (1) contains information that is proprietary to AREVA Inc., therefore, it are accompanied by an affidavit signed by AREVA, the owner of the information (Attachment 3). The affidavit sets forth the basis on which the information may be withheld form public disclosure by the Commission, and addresses, with specificity, the consideration listed in 10 CFR 2.390(b)(4). Accordingly, it is requested that the information that is proprietary to AREVA, Inc. be withheld from public disclosure. A non-proprietary version of Attachment (1) is included in Attachment (2).

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NRR

The requested information does not change the No Significant Hazards discussion in Reference 1. There are no regulatory commitments contained in this correspondence.

Should you have questions regarding this matter, please contact Mr. Larry D. Smith at (410) 495-5219.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 22, 2015.

Respectfully,

Mark D. Flaherty
Plant Manager

MDF/PSF/bjm

Attachments: (1) Request for Additional Information Regarding the As-found Lift Tolerances for the Pressurizer Safety Valves (Proprietary Version)
(2) Request for Additional Information Regarding the As-found Lift Tolerances for the Pressurizer Safety Valves (Non-Proprietary Version)
(3) AREVA Affidavit

cc: NRC Project Manager, Calvert Cliffs
NRC Regional Administrator, Region I
NRC Resident Inspector, Calvert Cliffs
S. Gray, MD-DNR

ATTACHMENT (2)

REQUEST FOR ADDITIONAL INFORMATION REGARDING THE AS-FOUND LIFT TOLERANCES FOR THE PRESSURIZER SAFETY VALVES (Non-Proprietary Version)

Calvert Cliffs Nuclear Power Plant
June 22, 2015

ATTACHMENT (2)

REQUEST FOR ADDITIONAL INFORMATION REGARDING THE AS-FOUND LIFT TOLERANCES FOR THE PRESSURIZER SAFETY VALVES
(Non-Proprietary Version)

By letter dated February 13, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14050A374), Calvert Cliffs Nuclear Power Plant, LLC, submitted a license amendment request (LAR) that proposed changes to the technical specification (TS) surveillance requirements (SRs) for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (Calvert Cliffs). The proposed LAR would revise the as-found lift tolerances in the SRs for the pressurizer safety valves. Based on its review, the Nuclear Regulatory Commission (NRC) staff requested the following additional information to complete its safety evaluation of the application:

REACTOR SYSTEMS BRANCH (SRXB) REQUEST FOR ADDITIONAL INFORMATION (RAI)-1:

On page 29 of AREVA analysis of the feedwater line break, calculation 32-9187689-001, estimates are provided for geometric parameters. Please explain the basis for these estimates.

CCNPP Response to SRBX RAI-1:

The nodalization of the steam generator (SG) was refined in the feedwater line break analysis to allow liquid to exit the break before steam is vented. The SG downcomer nodalization was refined such that the main feedwater nozzle elevation was [ ]. This nodalization allows S-RELAP5 to model liquid discharge from the SG side of the break until the level in the SG decreases below [ ]. The exact dimensions of the [ ] were not readily available. As such the distance from the [ ] above the tubesheet. Minor variations in the elevation of the break are more than compensated by the application of a negative bias on the initial SG level along with the spectrum of break sizes considered.

SRBX RAI-2:

A main steam safety valve closure time of 6 seconds is used in the analyses for the pressurization events. The Analysis Of Record (AOR) used a 7 second closure time. Please explain the basis for this change and the effect that it has on the peak pressure.

CCNPP Response to SRBX RAI-2:

It is assumed that the RAI question is referring to the Main Steam Isolation Valves (MSIVs), and not the Main Steam Safety Valves (MSSVs). An input of 7 seconds was assumed in the Analysis of Record to provide an extra second beyond that allowed by Technical Specifications.

Technical Specification 3.7.1, Main Steam Isolation Valves (MSIVs), require the MSIVs to be OPERABLE. Technical Surveillance SR 3.7.2.1 requires, "Verify closure time of each MSIV is within limits." The Frequency is "In accordance with the Inservice Testing Program". The Updated Final Safety Analysis Report Section 10.1.2.3, Main Steam Line Isolation, states, "The MSIVs' closure time is surveilled to 5.2 seconds, thus ensuring the valve will close within 6.0 seconds under accident conditions."

The peak primary system pressure from all of the events analyzed occurs during the Feedline Break event for the 0.02 ft^2 break size. This limiting analysis does not incur closure of the MSIVs because for the smaller break sizes, SG pressure remains above the MSIV closure setpoint.

Larger, less limiting Feedline breaks could incur closure of the MSIV. Closure of the MSIV isolates the intact steam generator. Longer MSIV closure times result in less inventory being made available for heat removal in the intact steam generator. However, for the larger break sizes analyzed which incur MSIV closure, the peak primary pressure occurs in the range of 3 to 3.5 seconds after the MSIV begins to close. Since the timeframe for secondary conditions to affect primary pressure is in the range of 10 seconds (RCS loop time), the peak primary pressure for the non-limiting cases are not significantly impacted by increasing the MSIV closure time by one second.

The Loss of Electrical Load Event (LOEL) analysis performed for peak primary pressure assumes fast closure of the Turbine Stop Valves (TSVs). The MSIVs closure time has no impact on the peak primary pressure. The limiting LOEL analysis for peak secondary pressure is due to a dual MSIV closure. The event considered MSIV closure times of 1.0 and 6.0 seconds. MSIV closure in 6.0 seconds resulted in the peak secondary pressure of 1101.8 psia, 14.7 psi below the acceptance criteria of 1116.5 psia. Based on the sensitivity of increasing the MSIV closure time from 1.0 to 6.0 seconds, which produced a peak pressure difference of 4.4 psi, it is expected that increasing the MSIV closing time further by 1 second could increase the peak secondary pressure by about 1 psi. This expected increase in peak secondary pressure is a small increase and well within the margin to the acceptance criteria.

The Loss of Normal Feedwater event primary and secondary overpressure analyses result in secondary pressure increase. MSIV closure time does not impact these analyses.

The Control Element Assembly Ejection event is analyzed for primary system overpressure. MSIV closure time has no impact on the event because the event is rapid, and steam generator pressures do not reach the MSIV closure setpoint.

SRBX RAI-3:

By letter dated February 13, 2014 (ADAMS Accession No. ML14050A374), the licensee submitted a LAR for Calvert Cliffs. The licensee requested approval of the methodology used for the analyses supporting this license amendment. A restriction provided in Appendix C of each unit's operating license requires prior NRC approval of a Calvert Cliffs-specific basis for the use of the methodology documented in AREVA Topical Report EMF-2310 to analyze transient performance relative to reactor coolant pressure boundary integrity.

The licensee provided Attachment 3 to the February 13, 2014, letter that summarizes results of application of the methodology described in AREVA Topical Report EMF-2310 for Calvert Cliffs pressure boundary integrity analysis. For the Calvert Cliffs application, please describe how the initial conditions prescribed by the approved methodology appropriately consider uncertainties, TS Limiting Safety System Settings, or TS Limiting Conditions for Operation. Also, please

describe the Calvert Cliffs specific implementation of guidelines in EMF-2310 for analysis assumptions, biasing of parameters, and dispositioning of events.

CCNPP Response to SRBX RAI-3:

The approved methodology is described in EMF-2310(P)(A). The biasing is adequately described in the approved methodology for protection against exceeding the fuel SAFDLs. The biasing of input process variables for non-LOCA transient calculations which show compliance with criteria other than the fuel SAFDLs is, in some cases, too prescriptive. The License Condition requiring prior NRC approval of a Calvert Cliffs-specific basis for the use of the methodology for showing compliance with criteria other than the fuel SAFDLs requires deviation from the EMF-2310(P)(A).

Process variables used in the event analysis are biased to assure that the results are conservative. A process variable is a measured plant condition that is input to plant observation and control systems. Process variables are also input to the Reactor Protective System (RCS) and Technical Specifications (TSs). These process variables undergo electronic processing to determine the measured plant state, which adds uncertainty to the measured value. In addition, some process variables are used as a target for a control system and may have a control deadband.

[

]

[

] For Calvert Cliffs over-pressure analyses, parameters were varied one at a time to determine the impact and most conservative setting. The range over which the parameter was varied included uncertainty and control deadband, as applicable. The limiting cases represent the process parameter biasing that most adversely affects the over-pressure results.

[

]

Calvert Cliffs implementation following approval will follow the same process as is used for other potential changes to the licensing basis. The description of the facility and analyses in the UFSAR and TS Bases will be updated as necessary to be in conformance with the approved licensing basis change. A change to the TS Bases follows the TS Bases Control Program, while a change to the UFSAR follows proceduralized processes.

SRBX RAI-4:

In the LAR, the licensee requested a change to TS 3.4.10 (Pressurizer Safety Valves) to "reduce an unnecessarily restrictive SR." During the audit meeting on March 25, 2015, the licensee's representatives described the as-found setpoints as a very tight tolerance band, tighter than that of most other plants. In addition, the licensee's representatives described how the upper and lower limits of the as-found setpoints are a careful balance between upper limits that will not exceed the American Society of Mechanical Engineers (ASME) Code limit of 110 percent design pressure, and the lower limits that establish operational margin. However, the peak calculated system pressure for the limiting design basis transient (feedwater line break) is 20 psi below the ASME Code limit, after the nominal setpoint for valve RC 201 was reduced 40 psi, which seems to be a large margin compared to a change in the tolerance band of about 25 psi or less. Describe in more detail how the values for the tolerance band were selected so that the SR would not be unnecessarily restrictive.

CCNPP Response to SRBX RAI-4:

The request for a larger (+3%) As-Found tolerance was based on the most common Industry 'As-Found' tolerance. This also aligns with information from the vendor (Dresser) as to the recommended 'As-Found' value that would be a basis for rebuilding the PSV when in situ testing was used. The lower bounds were selected to yield an opening setpoint that provides sufficient operational margin.

Since 2001, Calvert Cliffs has had 12 instances of an As-Found Setpoint failure (Outside of the TS range) of the PSVs. The five most recent events were issues with parts that Calvert Cliffs is working with the vendor to correct. Seven of the failures were due to setpoint drift. The setpoint and tolerances requested in this license amendment would have resulted in only three of these seven failures. Calvert Cliffs assumes 1 psi drift per month from the time the valve is set. The valves are normally set four months in advance of being installed, thus there can be a 28 psi drift positive over the 24 month refueling cycle.

Less restrictive As-Found tolerances will help maintain valve setpoints that are consistent with those applied in the analyses, will result in Calvert Cliffs being more in-line with the industry, and will help reduce the number of times the valves are found with setpoints out of tolerance with the TS.

SRBX RAI-5:

Please explain the changes in the current analysis for the feed line break that resulted in the decrease of the limiting feedline break size from 0.3 square feet in the current analysis to 0.02 square feet in the AOR.

CCNPP Response to SRBX RAI-5:

Two differences between the current UFSAR analysis and the AREVA analysis that contribute to the change in limiting feedline break size are a) the location of the feedwater nozzle and b) the initial pressurizer level assumed.

a) The modeling of the main feedwater nozzle (i.e. the break location) changed. UFSAR Section 14.26.3.2 describes Input Parameters and Initial Conditions for the current analysis. The description states,

"Due to uncertainty in modeling the transition through the two-phase flow region, the FLB location is conservatively modeled to be near the bottom of the SG. In reality, the feedwater nozzle is at a much higher elevation within the SG. The analysis assumes that saturated liquid is discharged through the break until the liquid mass reaches 5000 lbm, at which time saturated steam discharge is assumed. This assumption maximizes the liquid inventory discharge through the break, minimizes the energy removed from the primary by the SG, and thereby maximizes the RCS overpressurization."

This modeling, which locates the break at a low SG elevation, minimizes cooling by expelling low enthalpy liquid for a longer portion of the transient. The primary system pressure rise is dependent upon the RCS heatup due to the decrease in heat transfer area with decreasing SG liquid inventory. The current analysis limiting break size of 0.30 ft^2 represents a break size that has rapid SG liquid inventory loss, but has less benefit from cooling due to steaming.

The AREVA analysis locates the feed nozzle and break at a more realistic location. With this nodalization the SG pressure decreases more rapidly, the MSIVs close, and the Low SG Pressure trip occurs prior to the High Pressurizer Pressure trip for larger breaks.

b) AREVA sensitivity studies determined that a [ ] resulted in slightly higher peak RCS pressures for small break sizes. For small breaks, a [ ] causes a delay in the time to reach a reactor trip on High Pressurizer Pressure, allowing more time for the primary system pressure to increase. This delay is less apparent with larger breaks that trip the reactor on Low Steam Generator Pressure.

ATTACHMENT (3)

AREVA AFFIDAVIT

Calvert Cliffs Nuclear Power Plant
June 22, 2015

AFFIDAVIT

COMMONWEALTH OF VIRGINIA)
) ss.
CITY OF LYNCHBURG)

1. My name is Morris Byram. I am Manager, Product Licensing, for AREVA Inc. (AREVA) and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by AREVA to determine whether certain AREVA information is proprietary. I am familiar with the policies established by AREVA to ensure the proper application of these criteria.

3. I am familiar with the AREVA information contained in the Attachment to a letter from Mr. George H. Gellrich (Exelon) to U.S. NRC entitled, "Request for Additional Information Regarding the As-found Lift Tolerances for the Pressurizer Safety Valves License Amendment Request," Cover Letter # 15-032, and referred to herein as "Document." Information contained in this Document has been classified by AREVA as proprietary in accordance with the policies established by AREVA Inc. for the control and protection of proprietary and confidential information.

4. This Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by AREVA and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in this Document as proprietary and confidential.

5. This Document has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document be withheld from public disclosure. The request for withholding of proprietary information is made in

accordance with 10 CFR 2.390. The information for which withholding from disclosure is requested qualifies under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information."

6. The following criteria are customarily applied by AREVA to determine whether information should be classified as proprietary:

(a) The information reveals details of AREVA's research and development plans and programs or their results.

(b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.

(c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for AREVA.

(d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA in product optimization or marketability.

(e) The information is vital to a competitive advantage held by AREVA, would be helpful to competitors to AREVA, and would likely cause substantial harm to the competitive position of AREVA.

The information in this Document is considered proprietary for the reasons set forth in paragraphs 6(c) and 6(d) above.

7. In accordance with AREVA's policies governing the protection and control of information, proprietary information contained in this Document has been made available, on a limited basis, to others outside AREVA only as required and under suitable agreement providing for nondisclosure and limited use of the information.

8. AREVA policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.

Marvin E. Boyanfp

SUBSCRIBED before me this 17th day of June, 2015.

Sherry L. McFaden

Sherry L. McFaden
NOTARY PUBLIC, COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES: 10/31/18
Reg. # 7079129

SHERRY L. MCFADEN
Notary Public
Commonwealth of Virginia
7079129
My Commission Expires Oct 31, 2018