**George H. Gellrich**
Vice President

Calvert Cliffs Nuclear Power Plant, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657
410.495.5200
410.495-3500 Fax

CENG
a joint venture of
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CALVERT CLIFFS
NUCLEAR POWER PLANT

January 29, 2010

U. S. Nuclear Regulatory Commission
Washington, DC 20555

**ATTENTION:** Document Control Desk

**SUBJECT:** Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
License Amendment Request: Pressurizer Safety Valve Technical Specification Revision

Pursuant to 10 CFR 50.90, Calvert Cliffs Nuclear Power Plant, LLC hereby requests an Amendment to the Renewed Operating License Nos. DPR-53 and DPR-69 for Calvert Cliffs Unit Nos. 1 and 2, respectively that revises Technical Specification 3.4.10, Pressurizer Safety Valves. The proposed change modifies the existing Note within Technical Specification 3.4.10, which covers operation in the applicable portions of Mode 3.

The significant hazards discussion and the technical basis for this proposed change are provided in Attachment (1). The marked up page of the affected Technical Specification is provided in Attachment (2).

There are no regulatory commitments associated with this proposed amendment.

Calvert Cliffs Nuclear Power Plant requests approval of this proposed amendment by January 31, 2011 with an implementation period of 60 days.

A001
NRR

Should you have questions regarding this matter, please contact Mr. Douglas E. Lauver at (410) 495-5219.

Very truly yours,

George Gellrich

**STATE OF MARYLAND** :
: **TO WIT:**
**COUNTY OF CALVERT** :

I, George H. Gellrich, being duly sworn, state that I am Vice President - Calvert Cliffs Nuclear Power Plant, LLC (CCNPP), and that I am duly authorized to execute and file this License Amendment Request on behalf of CCNPP. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other CCNPP employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

George Gellrich

Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of St. Mary's, this 29th day of January, 2010.

JANET L. SCULLY
NOTARY
PUBLIC
ST. MARY'S COUNTY

**WITNESS** my Hand and Notarial Seal:

Janet L. Scully
Notary Public

My Commission Expires:

March 1, 2011
Date

GHG/KLG/bjd

Attachments: (1) Evaluation of the Proposed Change
(2) Marked up Technical Specification Page

cc: D. V. Pickett, NRC
S. J. Collins, NRC
Resident Inspector, NRC
S. Gray, DNR

# ATTACHMENT (1)

## EVALUATION OF THE PROPOSED CHANGE

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## 1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Renewed Operating Licenses DPR-53 and DPR-69 for Calvert Cliffs Nuclear Power Plant (Calvert Cliffs) Unit Nos. 1 and 2 by revising Technical Specification 3.4.10, Pressurizer Safety Valves (PSVs). The proposed change revises an existing NOTE within Technical Specification 3.4.10 that allows the PSVs lift settings to be outside Limiting Condition for Operation (LCO) limit, as a result of temperature related lift setting drift, while the Unit is in applicable portions of Mode 3.

## 2.0 DETAILED DESCRIPTION

Technical Specification 3.4.10 requires the two PSVs in each unit [1(2)RC-200 and 1(2)RC-201], to be operable during Modes 1, 2 and in Mode 3 when Reactor Coolant System (RCS) cold leg temperature is > 365°F (Unit 1), > 301°F (Unit 2). Surveillance Requirement 3.4.10.1 establishes the lift setting limits for the PSVs as specified below:

| Valve | As Found Lift Setting (psia) | As Left Lift Setting (psia) |
|---|---|---|
| 1(2) RC-200 | ≥ 2475 and ≤ 2550 | ≥ 2475 and ≤ 2525 |
| 1(2) RC-201 | ≥ 2514 and ≤ 2616 | ≥ 2540 and ≤ 2590 |

Technical Specification 3.4.10 currently contains a NOTE to allow an exception when a Unit is operating in the applicable portions of Mode 3. The NOTE reads as follows:

----------NOTE----------

The lift settings are not required to be within Limiting Condition for Operation limits during MODE 3 > 365°F (Unit 1), > 301°F (Unit 2) for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 36 hours following entry into MODE 3 >365°F (Unit 1), > 301°F (Unit 2) provided a preliminary cold setting was made prior to heatup.

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The proposed change seeks to revise the NOTE in Technical Specification 3.4.10 to read:

----------NOTE----------

The lift settings are not required to be within Limiting Condition for Operation limits during MODE 3 > 365°F (Unit 1), > 301°F (Unit 2) provided the lift settings of the pressurizer safety valves were established under conditions that reflect the normal operating temperatures experienced by the pressurizer safety valves when in MODES 1 and 2. This exception is allowed for 36 hours following entry into MODE 3 >365°F (Unit 1), > 301°F (Unit 2).

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The purpose of this proposed change is to revise the NOTE to reflect the existence of temperature related drift in the PSVs setting that occurs when the PSVs, while in Mode 3, are experiencing temperatures lower than experienced while the Unit is in Modes 1 or 2. This proposed change indicates the lift settings are not required to be within LCO limits while the Unit is in applicable Mode 3 conditions [> 365°F (Unit 1) or > 301°F (Unit 2)] provided the lift setting value was previously established under conditions that reflect the normal operating temperatures experienced by the PSVs. This exception applies for up to 36 hours following entry into the applicable portion of Mode 3 to allow for normal transition through this portion of Mode 3 during plant shutdowns and start ups. This time exception retains the same duration as the allowed time period currently contained in the existing NOTE.

## 3.0 TECHNICAL EVALUATION

Calvert Cliffs RCS includes two spring loaded PSVs for each Unit whose main purpose is to provide RCS overpressure protection. One PSV is set to open at approximately 2500 psia and the second is set to open at approximately 2565 psia. With these settings, the combined capacity of the PSVs helps ensure that the RCS pressure Safety Limit of 2750 psia is not exceeded during design basis accidents. At Calvert Cliffs, both PSVs are required to be operable during plant operation in Modes 1 and 2 and in Mode 3 when temperatures are > 365°F for Unit 1, and > 301°F for Unit 2. Below those temperatures in Mode 3 and while in Modes 4, 5, and 6, the two PSVs are not required to be operable as overpressure protection is maintained through the low temperature over pressure Technical Specification (Technical Specification 3.4.12).

To demonstrate the PSVs ability to meet their required safety function, the PSVs are periodically tested in accordance with Surveillance Requirement 3.4.10.1. Initially, Calvert Cliffs conducted this required surveillance testing during refueling outages with the PSVs installed in the RCS by measuring and setting, as necessary, the valves' lift setting using a hydrostatic lift rig. Under this approach, the PSVs lift settings were established while the PSVs were at temperatures that were not consistent with the PSVs ambient operating conditions experienced while in Modes 1 and 2. The practice used at Calvert Cliffs was consistent with industry's practice at that time. The NOTE in Technical Specification 3.4.10 was written to allow the utilities the flexibility to test and set the PSVs while in the applicable portion of Mode 3. This allowed the setting of the PSVs at temperatures as relatively close to the ambient conditions experienced by the PSVs while in Mode 1 as reasonably possible.

Over time, the industry identified issues with repeatability of lift setting results and with instances of PSVs lifting outside of allowed tolerances, so improved methods to more accurately test and set PSV lift settings were pursued. Studies showed that PSV lift settings were impacted by a change in valve body temperature. Testing revealed that an increase in the valve body's temperature resulted in an expansion of the valve's body and an elongation of its bonnet which relaxed spring pressure and resulted in a reduction in the lift setting of the valve. To address these issues, Calvert Cliffs implemented changes to improve the accuracy in regards to testing/setting of PSV lift settings. The most significant change undertaken involved sending the PSVs to an offsite vendor to test/set the PSV lift settings while the valves were subjected to conditions that replicated the ambient conditions experienced by the PSVs while in Mode 1. The valve temperature used by the vendor while measuring/setting the PSVs is based on the results obtained from thermocouples temporarily attached to the PSVs valve body during recent plant heat ups. Setting the PSVs at the temperature conditions experienced when operating in Mode 1, combined with the use of the vendor's more accurate lift setting equipment, helps ensure these valves will lift accurately at normal operating conditions while the unit is operating in Modes 1 and 2. Adoption of this approach has resulted in improved performance of PSVs both here at Calvert Cliffs and throughout the industry. These changes provide high assurance the PSVs will perform as expected to maintain RCS pressure below required RCS pressure Safety Limit of 2750 psia during design basis accidents while the unit is in Mode 1 and 2.

However, because of the valves' lift setting temperature dependency, it is now recognized that when the plant is operating in Mode 3 > 365°F (Unit 1), > 301°F (Unit 2) the PSV lift setting value will slightly increase when the valves are subjected to lower ambient temperatures than those experienced at normal Mode 1 temperature conditions. This slight increase in lift setting, as the PSVs cool down during a plant shutdown and while the PSVs heat up during a plant start up from lower modes, could result in their lift setting values drifting just beyond the allowed tolerance values established in the surveillance requirement. Since it is impractical, from both a radiation exposure and a harsh temperature environment

standpoint, to compensate for the temperature induced drift by resetting the PSVs lift setting each time the Unit enters the applicable portions of Mode 3, therefore it is necessary to demonstrate that the PSVs adequate RCS overpressure protection is maintained while in applicable portion of Mode 3 despite this temperature related PSV lift setting drift. Technical Specification Bases 3.4.10 indicates the PSVs are required in Modes 1 and 2 and portions of Mode 3 above the low temperature over pressure temperatures because the combined capacity of the two PSVs is required to keep reactor coolant pressure below 110% of its design value during certain design bases accidents. However, it also states that Mode 3 is conservatively included although the listed accidents may not require both safety valves for overpressure protection. To ensure the Unit maintains adequate reactor coolant overpresssure protection despite the slight PSV lift setting drift while in applicable Mode 3 conditions, a review was conducted of the existing design bases accidents that are potentially applicable when a Unit is in Mode 3. This review included a review of the following analyses:

1. Control Element Assembly (CEA) Withdrawal Event [Updated Final Safety Analysis Report (UFSAR) Section 14.2]
2. Excess Load Event (UFSAR Section 14.4)
3. Control Element Assembly Ejection Event (UFSAR Section 14.13)
4. Boron Dilution Event (UFSAR Section 14.3)

The CEA Withdrawal event is an event caused by a single malfunction in the Reactor Regulating System or Control Element Drive Mechanism control system that results in a continuous sequential CEA group withdrawal. The event is analyzed using conservative assumptions of more severe bounding conditions than experienced in Mode 3 including an assumption that the event initiates from a hot zero power condition and an assumption that no credit is taken for the actions of the pressurizer pressure and level control system to help mitigate the pressure increase experienced by the RCS. Even with these conservatisms, the analysis indicates RCS pressure remains below the PSV lift setting value. Based on this scenario, there is no challenge for the PSVs to respond and hence no challenge to the RCS pressure Safety Limit during a CEA Withdrawal event while in the applicable portions of Mode 3.

The Excess Load event is defined as any rapid, uncontrolled increase in steam generator flow that is not a steam line break. The most limiting case for this event involves a complete opening of the turbine control valves. Although the event is conservatively assumed to begin at a more severe bounding condition (hot zero power scenario) than Mode 3 conditions, the analysis indicates RCS pressure will decrease since the increased steam demand will cool down RCS temperature. Based on this scenario, there is no challenge for the PSVs to respond and hence no challenge to the RCS pressure Safety Limit during an Excess Load event while in the applicable portions of Mode 3.

The CEA Ejection event is defined as a rapid, uncontrolled, total withdrawal of a single or dual CEA. Once again the event is conservatively assumed to begin at a more severe bounding condition (hot zero power scenario), however the increase in RCS pressure during the event scenario is not addressed in any detail as the loss of RCS pressure barrier due to the CEA ejection prevents any significant RCS pressure buildup. Based on this scenario, there is no challenge for the PSVs to respond and hence no challenge to the RCS pressure Safety Limit during a CEA Ejection event while in the applicable portions of Mode 3.

A Boron Dilution event is classified as any event caused by a malfunction or an inadvertent operation of the Chemical Volume Control System which results in a dilution of the active portion of the RCS. The analysis for Mode 3 operation assumes that the response to a Boron Dilution event is basically similar to a CEA Withdrawal event as the increase in positive reactivity causes a slow increase in reactor power, temperature, and pressure. Therefore, the pressure increase assumed in the CEA Withdrawal event bounds the pressure change expected during a Boron Dilution event. As a result, there is no challenge for

the PSVs to respond and hence no challenge to the RCS pressure Safety Limit during a Boron Dilution event while in the applicable portions of Mode 3.

Based on this review it is determined there is no credible accident scenario that challenges the PSVs ability to provide RCS overpressure protection when either unit is in Mode 3. As a result, it is acceptable to operate in Mode 3 > 365°F (Unit 1), > 301°F (Unit 2) with PSV lift setting outside the allowed LCO value as a result of a temperature induced drift. Since there are no credible accident scenarios with the Unit in Mode 3 that challenge the PSVs to provide over pressure protection, it is shown that the PSV, while in Mode 3, does not meet any of the criterion of 10 CFR 50.36(d)(2)(ii) for inclusion within the Technical Specification. However for defense in depth purposes it is prudent to maintain and operate the PSVs according to current practices and to retain the Mode 3 > 365°F (Unit 1), > 301°F (Unit 2) applicability requirement within Technical Specification 3.4.10. Therefore the proposed change to the NOTE in Technical Specification 3.4.10 reflects this determination and modifies the NOTE to provide an exception in Mode 3 > 365°F (Unit 1), > 301°F (Unit 2) to allow the PSVs to be outside the Surveillance Requirement limits as a result of temperature induced drift. The revised NOTE continues to limit this exception to 36 hours which allows for normal transition through this mode condition during normal start up and shutdown operations and to allow, should an unexpected need arise, sufficient time to test/set PSVs during this mode condition.

## 4.0 REGULATORY EVALUATION

### 4.1 Applicable Regulatory Requirements/Criteria

Calvert Cliffs Unit Nos. 1 and 2 were designed and constructed to meet the requirements of the Atomic Energy Commission's July 10, 1967 proposed General Design Criteria (GDC) for nuclear power plants. The requirements governing the design of Calvert Cliffs Reactor Coolant System (RCS) overpressure protection include:

1. Draft General Design Criteria 33, Reactor Coolant Pressure Boundary Capability. This draft GDC requires that the reactor coolant pressure boundary be capable of accommodating without rupture the static and dynamic loads imposed on any boundary component as a result of any inadvertent and sudden release of energy to the coolant.

2. Standard Review Plan 5.2.2, Overpressure Protection. This Standard Review Plan requires RCS safety valves shall be designed with sufficient capacity to limit RCS pressure to less than 110% of RCS pressure boundary design pressure during the most severe abnormal operational transient.

Since there is no credible design bases accident while the Unit is in Mode 3 that results in a reactor coolant pressure increase that approaches the PSVs lift setting value, the PSVs are not necessary for maintaining RCS pressure below the RCS Safety Limit pressure while the Unit is in Mode 3. As a result the proposed change continues to meet all applicable regulatory requirements and criteria.

### 4.2 Significant Hazards Consideration

Calvert Cliffs is proposing a change to Technical Specification 3.4.10, Pressurizer Safety Valves (PSVs), to allow the PSVs lift settings to be outside Limiting Condition for Operation (LCO) values, as a result of temperature related drift, while the Unit is in applicable portions of Mode 3 for periods up to 36 hours. The proposed change has been evaluated against the three standards contained in 10 CFR 50.92 and has been determined to not involve a significant hazards consideration in the operation of the facility for the reasons provided below.

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

   No.

   The proposed change, revising an existing NOTE within Technical Specification 3.4.10 to allow the PSVs lift settings to be outside LCO values, as a result of temperature related drift, while the Unit is in applicable portions of Mode 3 for periods up to 36 hours, does not change the design function or operation of the PSVs and it does not change the way the PSVs are maintained, tested, or inspected. In addition the proposed change does not change any of the evaluated accidents in our Updated Final Safety Analysis Report, does not change PSV lift settings, or impact the ability of the PSVs to perform their safety function during evaluated accidents.

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

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

   No.

   The proposed change, revising an existing NOTE within Technical Specification 3.4.10 to allow the PSVs lift settings to be outside LCO values, as a result of temperature related drift, while the Unit is in applicable portions of Mode 3 for periods up to 36 hours, does not change the PSVs design function to maintain RCS pressure below the RCS pressure Safety Limit of 2750 psia during design basis accidents nor does it affect the PSVs ability to perform this design function. The proposed change does not require any modification to the plant or change equipment operation or testing. It also does not create any credible new failure mechanisms, malfunctions, or accident initiators that would cause an accident not previously considered.

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

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

   No.

   The proposed change, revising an existing NOTE within Technical Specification 3.4.10 to allow the PSVs lift settings to be outside LCO values, as a result of temperature related drift, while the Unit is in applicable portions of Mode 3 for periods up to 36 hours, does not involve a significant reduction in the margin of safety in maintaining RCS pressure below Safety Limits of 2750 psia during design basis accidents. The analysis conducted in support of this proposed change evaluated the ability of the PSVs to maintain an adequate safety margin when required in applicable Mode 3 conditions despite the identified temperature related lift setting drift. The analysis identified that there were no credible design accident scenarios, when in the applicable Mode 3 conditions, that challenged the PSVs to respond in order to maintain an adequate safety margin to the reactor coolant Safety Limit of 2750 psia.

   Therefore the proposed change does not involve a significant reduction in the margin of safety of maintaining RCS pressure the below RCS pressure Safety Limit.

Based on the above, Calvert Cliffs concludes that the proposed change does not involve a 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.

### 4.3 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

## 5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed change, which revises an existing NOTE within Technical Specification 3.4.10 to allow the PSVs lift settings to be outside LCO limits, as a result of temperature related lift setting drift, while the Unit is in applicable portions of Mode 3 for periods up to 36 hours, would change a requirement with respect to use of a facility component within the restricted area. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change 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.

# ATTACHMENT (2)

## MARKED UP TECHNICAL SPECIFICATION PAGE

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.10 Pressurizer Safety Valves

LCO 3.4.10 Two pressurizer safety valves shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with all RCS cold leg temperatures > 365°F (Unit 1),
> 301°F (Unit 2).

---------- NOTE ----------
The lift settings are not required to be within Limiting Condition for Operation limits during MODE 3 > 365°F (Unit 1), > 301°F (Unit 2) ~~for the purpose of setting the pressurizer safety valves under ambient (hot) conditions~~. This exception is allowed for 36 hours following entry into MODE 3 > 365°F (Unit 1), > 301°F (Unit 2), ~~provided a preliminary cold setting was made prior to heatup.~~
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INSERT

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One pressurizer safety valve inoperable. | A.1 Restore valve to OPERABLE status. | 15 minutes |

provided the lift settings of the pressurizer safety valves were established under conditions that reflect the normal operating temperatures experienced by the pressurizer safety valves when in Modes 1 and 2.