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September 20, 2002

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: Revision to Technical Specification 3.9.5

REFERENCES:

(a) Industry/TSTF Standard Technical Specification Change Traveler TSTF-349, "Add Note to LCO 3.9.5 Allowing Shutdown Cooling Loops Removal from Operation," Revision 1

(b) Industry/TSTF Standard Technical Specification Change Traveler TSTF-361, "Allow Standby SDC Loop to be Inoperable to Support Testing," Revision 2

Pursuant to 10 CFR 50.90, Calvert Cliffs Nuclear Power Plant, Inc. hereby requests an amendment to Renewed Operating License Nos. DPR-53 and DPR-69 to incorporate the changes described below into the Technical Specifications for Calvert Cliffs Unit Nos. 1 and 2.

DESCRIPTION

The proposed amendment revises Technical Specification 3.9.5, SDC and Coolant Circulation – Low Water Level, for Unit Nos. 1 and 2 to add two notes to allow operational changes in the Shutdown Cooling (SDC) System to support operations and testing. Technical Specification 3.9.5 requires that two SDC loops be operable and one be in operation whenever the water level is lower than 23 feet above the irradiated fuel in the reactor vessel. This proposed amendment revises Technical Specification 3.9.5 to allow two changes to this condition. The first would allow the SDC pumps to be de-energized for $\leq$ 15 minutes when switching from one train to another. The second change would allow one SDC loop to be inoperable for up to two hours for surveillance testing, provided that the other loop was operable and in operation. Details of this request are provided in Attachment (1). These changes are consistent with changes previously approved for the Improved Standard Technical Specifications (ISTS) as described in Technical Specification Task Force (TSTF)-349 (Reference a) and TSTF-361 (Reference b). Marked up Technical Specification pages are contained in Attachment (3). Changes to the Technical Specification Bases consistent with TSTF-349 and TSTF-361 will be made once this request is approved.

A001

ASSESSMENT

We have evaluated the significant hazards considerations associated with this proposed amendment, as required by 10 CFR 50.92, and have determined that there are none (See Attachment 2 for a complete discussion). We have also determined that operation with the proposed amendments will not result in any significant change in the types or significant increases in the amounts of any effluents that may be released offsite, and no significant increases in individual or cumulative occupational radiation exposure. Therefore, the proposed amendments are eligible for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact assessment is needed in connection with the approval of the proposed amendments.

SAFETY COMMITTEE REVIEW

The Plant Operations and Safety Review Committee and the Offsite Safety Review Committee have reviewed these proposed amendments and concur that operation with the proposed amendments will not result in an undue risk to the health and safety of the public.

SCHEDULE

Approval of this request will result in greater stability in the operation of the SDC System during outages. We would like to be able to implement these changes during our next refueling outage currently scheduled for February 2003. Therefore, we request approval of this proposed amendment as soon as possible or by February 1, 2003.

PRECEDENT

These changes have been approved by the Nuclear Regulatory Commission for incorporation in the ISTS and are incorporated in NUREG-1432, Revision 2. Plants converting to the ISTS under Revision 2 of the NUREG could adopt these changes. In addition, a plant has received approval for one of these changes. It is listed below.

- TSTF 361, "Allow Standby SDC Loop to be Inoperable to Support Testing"
  Palo Verde – approved March 1, 2002

Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

Peter E. Katz

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

I, Peter E. Katz, being duly sworn, state that I am Vice President - Calvert Cliffs Nuclear Power Plant, Inc. (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.

Peter E. Katz

Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of Calvert, this 20th day of September, 2002.

WITNESS my Hand and Notarial Seal:

Denise D. Swiss
Notary Public

My Commission Expires:

02/01/06
Date

PEK/PSF/bjd

Attachments: (1) Analysis
(2) Determination of Significant Hazards
(3) Marked Up Pages

cc: J. Petro, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
D. M. Skay, NRC
H. J. Miller, NRC
Resident Inspector, NRC
R. I. McLean, DNR

ATTACHMENT (1)

ANALYSIS

ATTACHMENT (1)

ANALYSIS

Background

The Shutdown Cooling (SDC) System is used to remove core decay heat and reactor coolant sensible heat during plant cooldowns and cold shutdowns. In the SDC mode of operation, reactor coolant is circulated through the tube side of the SDC heat exchanger using the low-pressure safety injection (LPSI) pumps. The flowpath from the pump discharge runs through the shutdown cooling heat exchangers to the LPSI header, and enters the Reactor Coolant System (RCS) through the four safety injection nozzles. The circulating fluid flows through the core and is returned from the RCS through the SDC nozzle in the loop No. 2 reactor vessel outlet (hot leg) pipe. The coolant is returned to the suction of the LPSI pumps.

Proposed Change

Currently, Limiting Condition for Operation (LCO) 3.9.5 requires two SDC loops to be operable and one in operation when a unit is in Mode 6 with < 23 feet of water above the top of irradiated fuel assemblies seated in the reactor vessel. A SDC loop may be replaced by a spent fuel pool cooling loop under some conditions. Two changes are proposed to modify this requirement. The first proposed change would allow all SDC pumps to be de-energized for ≤ 15 minutes when switching from one train to another. Several criteria are provided, as described below, to ensure that this is a safe transition. This change will make it easier to transition between operating trains of SDC by substantially reducing the potential for flow perturbations. The second proposed change would allow one SDC loop to be inoperable for up to two hours for surveillance testing if the other SDC loop is operable and in operation. Several considerations are outlined below to ensure that this is a safe condition. The criteria and considerations associated with these proposed changes will be included in the Technical Specification Bases as described in the applicable Technical Specification Task Force change.

Safety Analysis

The purpose of the SDC System in Mode 6 is to remove decay heat and sensible heat from the RCS, to provide mixing of borated coolant, to provide sufficient coolant circulation to minimize the effects of a boron dilution event and to prevent boron stratification. Operation of the SDC System for normal cooldown or decay heat removal is manually accomplished from the Control Room. The heat removal rate is adjusted by controlling the flow of reactor coolant through the SDC heat exchangers or bypassing the heat exchangers. This continuous circulation of reactor coolant through the SDC System maintains mixing of the reactor coolant.

One of the proposed changes would permit the SDC pumps to be deenergized for ≤ 15 minutes when switching from one train to another. When the pumps are deenergized, three conditions will apply. The core outlet temperature will be maintained more than 10 degrees below the saturation temperature to ensure that boiling of the reactor coolant does not occur. No operations will be permitted that would cause a reduction in the RCS boron concentration to prevent concerns about possible boron dilution and mixing. Consideration will be given to the issue of time to boil in the core and further draining of the RCS will not be permitted so that an adequate borated heat sink will continue to exist during this time.

The second change would allow one of the SDC loops to be inoperable for a limited time for surveillance testing. The remaining loop would be operable and in operation. Several factors will be used to determine when it is appropriate to enter this condition. Consideration will be given to issues like the time to boil in the core, draining of the RCS, and availability of systems to inject borated water into the reactor core. This proposed change would permit required surveillance tests to be performed on the inoperable loop during a time when these tests are safe and possible.

The design basis accident affected by the proposed change is the Boron Dilution Event. Consideration is also given to a loss of decay heat removal in Mode 6 as well. Both of these conditions are evaluated in the Updated Final Safety Analysis Report (UFSAR). The evaluations consider operation of the SDC system to mitigate these conditions.

A Boron Dilution Event is defined as any event caused by a malfunction of or an inadvertent operation of the Chemical and Volume Control System that results in a dilution of the active portion of the RCS. The active portion of the RCS is defined as that volume of water that circulates through the core. When in the SDC mode, no credit is taken for the volume of water in the steam generator or other stagnant portions of the RCS. A dilution of the RCS can be the result of adding water that has a boron concentration that is less than the system boron concentration, or by the removal of boron using a purification ion exchanger with a deborating resin. The analysis of the Boron Dilution Event covers all six modes of operation and is described in the UFSAR, Section 14.3.

The role of the SDC system in preventing or mitigating a Boron Dilution Event is that it provides mixing of the reactor coolant, so that boron stratification does not occur. It also circulates the coolant to minimize the effects of a Boron Dilution Event, should one occur.

For this amendment request, only the Boron Dilution Event in Mode 6, with < 23 feet of water over the fuel seated in the reactor vessel is considered, since that is the plant condition covered by the Technical Specification. For Mode 6, the analysis uses assumptions that are conservative for operations in this plant mode. These proposed changes to the Technical Specifications do not alter these assumptions in a non-conservative way. The proposed change to allow both SDC pumps to be deenergized for < 15 minutes would eliminate SDC flow for that period of time. In addition, the proposed change would require that no operations be permitted during this short time that would reduce the boron concentration. With no actions to reduce boron concentration during this evolution, the analysis in the UFSAR bounds the proposed condition, because it assumes that boron concentration reduction is taking place. The analysis in the UFSAR shows that the operator has sufficient time (greater than 30 minutes) to take appropriate action to mitigate the consequences of this event in Mode 6. The reduction of flow for this short period of time would have no negative impact on the UFSAR conclusion.

Another function of the SDC system is to remove sensible and decay heat from the RCS. Both proposed changes impact the ability of the SDC system to perform this function.

The first proposed change would allow both SDC pumps to be deenergized for no more than 15 minutes to switch from one pump to another. This is a short period of time to be without coolant flow through the reactor core. There are two restrictions to entering this condition. The first restriction would require that the core outlet temperature be maintained more than 10 degrees below the saturation temperature. This will provide margin to the saturation temperature and ensure that bulk boiling of the coolant is not underway and does not occur. Consideration of the time to boil coolant in the core region will be factored in to the decision to enter this condition. In addition, no additional draining of the RCS is permitted while switching pumps. The water in the RCS is a passive heat sink and the water level must be maintained to ensure that adequate heat removal continues for this short duration condition. Maintaining water level also ensures that there is adequate level to restart a SDC pump without cavitating the pump. These restrictions will ensure that the SDC system can continue to adequately remove heat from the RCS, even with the allowance for deenergizing both pumps for a short period of time.

The second proposed change would allow one of the SDC loops to be inoperable for up to two hours for required surveillance testing. One SDC loop will remain in operation. The loss of one loop for a limited period of time reduces the heat removal capability of the system. Therefore, plant configuration and activities need to be carefully considered before entering this condition. One consideration is the time for

the bulk reactor coolant to boil in the core. With limited heat removal capability, the time to boil should be sufficiently long so that operators can take action to restore the inoperable loop to operation, line up alternate cooling or add additional borated water to the reactor vessel. To support these possible operator actions, consideration also needs to be given to the systems available to inject borated water into the reactor core. The systems need to be evaluated to determine if they are capable of injecting borated water into the core at the time the condition exists. In addition to these considerations, any further reductions in RCS level should be evaluated prior to entering this condition. Since the bulk water in the RCS is providing some of the heat removal capability (along with the operating SDC train), a further reduction of that heat sink may not be warranted when one SDC loop is not in service. After proper consideration of these conditions, one SDC loop can be removed from service for a limited period of time for required surveillance testing and the system can still adequately remove heat from the RCS.

Based on the above evaluations, the SDC system can be removed from service for a limited amount of time, with operational restrictions and the consequences of the above events are limited to the consequences already assumed in the UFSAR. Thus, there is no increase in offsite dose (none is associated with either event).

It should also be noted that both of these proposed changes are consistent with allowances currently in place for LCO 3.4.8, RCS Loops – Mode 5, Loops Not Filled. The plant condition permitted by LCO 3.4.8 is consistent with the plant condition allowed by LCO 3.9.5.

ATTACHMENT (2)

DETERMINATION OF SIGNIFICANT HAZARDS

ATTACHMENT (2)

DETERMINATION OF SIGNIFICANT HAZARDS

The proposed amendment revises Technical Specification 3.9.5, SDC and Coolant Circulation – Low Water Level, for Unit Nos. 1 and 2 to add two notes to allow operational changes in the Shutdown Cooling (SDC) System to support operations and required testing. Technical Specification 3.9.5 requires that two SDC loops be operable and one be in operation whenever the water level is lower than 23 feet above the irradiated fuel in the reactor vessel. This proposed amendment revises Technical Specification 3.9.5 to allow two changes to this condition. The first would allow the SDC pumps to be de-energized for less than or equal to 15 minutes when switching from one train to another. The second change would allow one SDC loop to be inoperable for up to two hours for surveillance testing, provided that the other loop was operable and in operation.

These proposed changes have been evaluated against the standards in 10 CFR 50.92 and have been determined to not involve a significant hazards consideration, in that operation of the facility in accordance with the proposed amendments:

1. *Would not involve a significant increase in the probability or consequences of an accident previously evaluated.*

   The system affected by this proposed amendment is the Shutdown Cooling (SDC) System. This system mitigates the consequences of a boron dilution event and removes decay heat from the Reactor Coolant System when the unit is in Mode 6. This proposed amendment revises the Technical Specification to allow the SDC pumps to be deenergized for less than or equal to 15 minutes to allow swapping from one operating train to another, and would allow one SDC loop to be inoperable for up to two hours for surveillance testing. Because this system is used for the mitigation of an accident, it is not an accident initiator. Therefore, the probability of an accident previously evaluated is not increased.

   The only design basis accident considered in this Mode is a boron dilution event. Consideration is also given to a loss of decay heat removal in this Mode as well. Both of these conditions are evaluated in the Updated Final Safety Analysis Report (UFSAR). The evaluations consider operation of the SDC system to mitigate these conditions. Removing this system from service for a limited amount of time, with other operational restrictions, limits the consequences to those already assumed in the UFSAR. Thus, no increase in offsite dose occurs under these conditions. Therefore, the consequences of an accident previously evaluated have not increased.

   Therefore, the probability or consequences of an accident previously evaluated have not significantly increased.

2. *Would not create the possibility of a new or different type of accident from any accident previously evaluated.*

   The proposed changes do not involve a significant change in the operation of the plant and no new accident initiation mechanism is created by the proposed changes. The SDC System is not being altered by this amendment request. No substantial changes are made in the way in which the SDC System is operated. The only change made would allow both SDC pumps to be deenergized to swap operating trains, and one SDC loop to be inoperable for less than two hours to allow for surveillance testing. Since the SDC System is an accident mitigating system only, changes in when this system is needed to operate cannot create a new type of accident.

   Therefore, the possibility of a new or different type of accident from any previously evaluated is not created.

3. *Would not involve a significant reduction in a margin of safety.*

The margin of safety provided by the SDC System is to provide boration control and to remove decay and sensible heat from the Reactor Coolant System as described in the UFSAR. Removal of system components from service as described above, and with limitations in place to prevent boron dilution and loss of decay and sensible heat removal, does not significantly impact the margin of safety. The SDC System will continue to be able to provide its safety function under these conditions. Operators will continue to have adequate time to respond to any off-normal events. Removing the system from service, for a limited period of time, with other operational restrictions limits the consequences to those already assumed in the UFSAR. Therefore, no reduction in the margin of safety has occurred because the event results in the UFSAR are not changed by operation in the proposed conditions.

Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

ATTACHMENT (3)

MARKED UP PAGES

3.9.5-1

3.9 REFUELING OPERATIONS

3.9.5 Shutdown Cooling (SDC) and Coolant Circulation-Low Water Level

LCO 3.9.5 Two SDC loops shall be OPERABLE, and one SDC loop shall be in operation.

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

1. One SDC loop may be replaced by one spent fuel pool cooling loop provided it is lined up to provide cooling flow to irradiated fuel in the reactor core and the core heat generation rate is less than the heat removal capacity of the spent fuel cooling loop.

APPLICABILITY: MODE 6 with the water level < 23 ft above the top of the irradiated fuel assemblies seated in the reactor vessel.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SDC loop inoperable.	A.1 Initiate action to restore SDC loop to OPERABLE status. OR A.2 Initiate action to establish ≥ 23 ft of water above the top of irradiated fuel assemblies seated in the reactor vessel.	Immediately Immediately

ATTACHMENT (3)

MARKED UP PAGES

Insert

2. One required SDC loop may be inoperable for up to 2 hours for surveillance testing, provided that the other SDC loop is OPERABLE and in operation.

3. All SDC pumps may be de-energized for ≤ 15 minutes when switching from one train to another provided:

   a. The core outlet temperature is maintained > 10 degrees F below saturation temperature;
   b. No operations are permitted that would cause a reduction of the Reactor Coolant System boron concentration; and
   c. No draining operations to further reduce Reactor Coolant System water volume are permitted.