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July 14, 2003

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: Change to the Testing Requirements for Containment Spray Nozzles

Pursuant to 10 CFR 50.90, Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP) requests an amendment to Renewed Operating License Nos. DPR-53 and DPR-69 to change the testing requirements for the containment spray nozzles.

REQUESTED CHANGE

The proposed amendment revises the Technical Specifications to eliminate Surveillance Requirement 3.6.6.8. This surveillance requirement is a 10-year flow test to verify that the containment spray nozzles are unobstructed.

The marked up Technical Specification page for the proposed change is shown in Attachment (1). Final Technical Specification pages are not included since deletion of this surveillance will result in a blank page. The Technical Specification Bases will be changed to reflect this amendment as approved.

SAFETY ANALYSIS

The containment heat removal systems for Calvert Cliffs consist of the containment air cooler system and the Containment Spray System (CSS) The CSS actuates automatically (on a High containment pressure signal) or remote-manually from the Control Room. The CSS has two safety functions. The CSS removes heat from the containment atmosphere following a design basis loss-of-coolant accident (LOCA) or main steam line break accident inside Containment. This ensures that the containment pressure does not exceed the containment design pressure. The CSS also assists in removing iodine and other radionuclides from the containment atmosphere following a LOCA.

The CSS is described in Section 6.4, "Containment Spray System," of the Calvert Cliffs Updated Final Safety Analysis Report. It consists of two independent 50 percent capacity trains with no common headers. The CSS nozzles are made of corrosion resistant stainless steel and are of a hollow core, centrifugal-type design without any moving parts which could cause clogging. The system includes two spray headers, with a total of 179 nozzles in Unit 1 and 180 nozzles in Unit 2. The minimum area flow

A001

path in the CSS is the spray nozzle. The nozzle orifice will pass particles less than 0.375 inches in diameter.

Technical Specification Surveillance Requirement 3.6.6.8 currently requires a test every ten years to ensure that the CSS nozzles are not obstructed. The test is currently done with the spray inlet valves closed. Low pressure air or smoke is blown through test connections downstream of the spray inlet valves and observation of flagging on the nozzles confirm flow from each nozzle. Low pressure air, or smoke are widely accepted methods that are used by the industry. Flow through the nozzles was proven in pre-operational tests and in two ten-year tests since then. The latest tests were performed in 1994 (Unit 1) and 1997 (Unit 2). Those tests proved that all operable nozzles have unobstructed flow.

One postulated mode of blockage of the spray headers and nozzles is solid boric acid accumulation in the spray lines or nozzles due to evaporated borated water. The spray headers are maintained dry and are isolated from the water in the rest of the CSS by a normally shut, air-operated control valve on each header. To accommodate potential control valve leakage, the headers downstream of the control valves are maintained dry by a drain in each header that directs any leakage to the containment sump. A flow orifice restricts flow through the drain so that the required flow for containment spray is not compromised. The CSS piping is stainless steel, which prevents corrosion products from forming.

Another possible blockage source is debris (foreign material) in the system. Maintenance and calibrations are routinely performed on the CSS. During this work the system may be open and the Foreign Material Exclusion (FME) Program applies. The FME Program requires that any breaches of system boundaries during maintenance activities be protected from intrusion of material foreign to the system. Examples of FME controls are: covers for open pipes, in-progress and close-out inspections, and accounting for tools, materials and parts. The FME Program requires the highest level of control for safety-related systems such as the CSS. Inventory of all material used and capture of all foreign material created (such as from grinding, welding, and machining) are important aspects of this program. If control of foreign material is lost, the material is required to be recovered. If the foreign material is not recovered, it must be evaluated to determine it's impact on system operability. System engineers and cognizant management would participate in the recovery efforts. The loss of FME control is entered into the plant's corrective action system.

Foreign Materials Exclusion Program

Calvert Cliffs Procedure MN-1-109, "Foreign Material Exclusion Program," provides the necessary requirements and guidance to prevent and control the introduction of foreign material into structures, systems, and components. It also controls the investigation and recovery actions when FME integrity is lost or unexpected material is discovered. Foreign material exclusion controls are required to be established any time that a system or component is opened for maintenance, regardless of size. The FME requirements are documented in each work package. The work planner determines the foreign material exclusion area (FMEA) and any special requirements based on the planned work activity or task. The FMEA requires authorization for entry.

At Calvert Cliffs, there are four categories of FMEAs as defined by American Society of Mechanical Engineers/American National Standards Institute N45.2.3(a), Housekeeping During the Construction Phase of Nuclear Power Plants, February 15, 1978:

Zone 1 - An FMEA requiring the highest level of cleanliness, including complete outer change of clothing by personnel. (There are no Zone 1 systems or components at CCNPP.)

Zone 2 - An FMEA requiring a higher level of control or an FMEA where foreign material intrusion could cause fuel failure. Material pre-cleaning and material and personnel accountability are used.

Zone 3 - An FMEA where Foreign Material Exclusion Controls are less restrictive than Zone 2, but material and personnel accountability are used.

Zone 4 - The minimum level of Foreign Material Exclusion control.

The Containment Spray System is a Zone 2 system.

The following general guidance applies to all FME zones:

- Foreign material exclusion areas are identified by a barrier and signs.
- Work areas are cleaned following the job and, if necessary, periodically while work is in progress.
- Canvas or other suitable covering is used when working on or above open grating to prevent materials and tools from dropping through the grating to a lower level. Searches are made upon completion of the task to ensure debris has not fallen to levels below that of the task.
- Waste material and rubbish are placed in proper containers for disposal.
- All personnel and materials, including discarded trash, are accounted for on a Personnel and Material Control Log.
- All hand tools are tethered and, when appropriate, additional preventive measures to control tools, material, and debris are used.
- All transient tools and equipment are removed at the end of the work.
- Coverings protect permanent material or equipment located in the work area, if necessary.
- Barriers, screens, shields, access restrictions, or other protection are provided as necessary to isolate areas in which welding, dust, inclement weather, or other conditions may affect the quality of work.
- The use, location, and deployment of tools and equipment, such as welding and stress relieving leads, welding machines, hydraulic power units, air and water hoses, compressor units, gas bottles, and portable air tools are minimized within established FMEAs.
- System and component openings are kept covered, except when performing necessary operations.

Only trained workers, whether plant or contractor, may perform work independently in an FMEA. Under special circumstances, non-trained workers may perform work in an FMEA provided the work is continuously supervised or monitored by trained plant or contractor personnel. The FME Program not only applies to maintenance performed on open systems, but also to such activities as lubrication, chemistry additions, sampling, filling, draining, radiation surveying, inspections, surveillance testing, and refueling activities.

The Calvert Cliffs Self-Assessment Program shows that the FME Program is robust and effective.

In summary, the FME Program requires that all system breaches be covered where possible except when the specific opening is attended or work, inspection, testing, sampling, or surveying is in progress that requires removal of the FME device. Foreign material exclusion devices are clearly marked to prevent inadvertent removal or damage. The work area is verified to be clean and free of foreign material prior to commencing work activities and is documented. In-process inspections are performed to ensure that

prescribed FME requirements are being effectively implemented. A final cleanliness inspection is also performed to verify the system, component, or process is free of foreign material prior to final closure. This inspection is also documented.

If FME integrity is lost, the system engineer or cognizant management individual is notified to help assess the situation and a condition report is written. A recovery plan is developed and implemented.

The FME Program provides assurance that debris or foreign material will not be left in the CSS. When the CSS is opened for maintenance or testing, appropriate FME controls are put in place to prevent the introduction of foreign material.

Post-Maintenance Testing

This request proposes to delete Surveillance Requirement 3.6.6.8, since it is equivalent to a post-maintenance test. Following maintenance activities, post-maintenance testing (PMT) is performed to ensure that the equipment is capable of performing its intended function when returned to service. During each refueling outage a surveillance test procedure is performed to demonstrate the ability of the containment spray check valves to pass flow. To do this without allowing water to enter the spray header, a normally open isolation valve is shut and flow is diverted through a small orifice in a 3/4" drain line that runs from the spray header, downstream of the check valves, to the containment sump. Partial stroke of the check valves is demonstrated by visual verification of flow to the sump. Successful completion of the surveillance test procedure also demonstrates reasonable assurance that the piping between the check valves and the drain is not blocked. This surveillance test procedure is often specified for PMT on containment spray components when deemed appropriate by the operations department. The requirements for the control of PMT are contained in Calvert Cliffs Procedure MN-1-201, "Post Maintenance Test Definitions and the Control of PMT Matrix Modules." Test matrices are provided for various components depending on the type of maintenance that was performed. Matrix modules are provided for CSS components that are subject to routine maintenance, such as pumps and valves. The PMT Program is an additional means of demonstrating that a system is free of foreign material that could significantly reduce its ability to perform its intended function. The PMT Program does not provide guidance for maintenance performed on the containment spray ring header or nozzles, but does direct that, should maintenance be performed on these components, the system or component engineer is empowered to provide guidance on the appropriate PMT to be performed. A review of the available maintenance history indicates that no maintenance has been performed on the spray headers or nozzles.

This proposed change is based on the existing requirement to verify system operability after system maintenance or repair, which could result in nozzle blockage, so that flow will be provided when required. Limiting Condition for Operation (LCO) 3.0.1 requires that LCOs be met during the conditions specified in the Applicability. The LCO for the CSS requires that it be operable. The Bases for Surveillance Requirement 3.0.1 states, "Upon completion of maintenance, appropriate post-maintenance testing is required to declare the system operable." Therefore, the nozzles only require PMT following maintenance that could obstruct them. Reference to PMT on specific equipment is not required to be in the Technical Specifications.

Performance History

Flow through the nozzles was proven in pre-operational tests and in two ten-year tests since then. The latest tests were performed in 1994 (Unit 1) and 1997 (Unit 2). Those tests proved that all operable nozzles have unobstructed flow. No work has been done on the CSS header or nozzles since these tests. Maintenance work has been done on the portions of the system upstream of the containment spray header

isolation control valve. This work was performed with FME controls in place; therefore, the likelihood that any unknown foreign materials were introduced into the system is extremely low.

SUMMARY

After reviewing all of the available information, we conclude that the design of the CSS (corrosion resistance, nozzle location, and dry headers), the previous testing of the spray system, and the FME controls provide reasonable assurance that the potential for nozzle obstruction is acceptably low. The FME controls provide protection against the introduction of foreign materials into open piping during maintenance or testing and require post-maintenance verification of system cleanliness and freedom from foreign materials.

We feel that the elimination of this surveillance and the reliance on PMT and the FME Program to ensure that the nozzles are operational is justified.

DETERMINATION OF SIGNIFICANT HAZARDS

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

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

   The proposed change eliminates the surveillance requirement to verify that the Containment Spray System spray nozzles are unobstructed every ten years. The spray nozzles are not initiators of any previously analyzed accident. Therefore, this proposed change does not increase the probability of any accident previously evaluated.

   The spray nozzles are assumed in the accident analysis to mitigate design basis accidents. Calvert Cliffs' system design Foreign Material Exclusion practices during maintenance and material accountability following maintenance, and post-maintenance testing practices ensure that the system is free of foreign material that could significantly reduce its ability to perform its intended function. These controls are considered adequate to ensure continued operability of the spray system. Since the system will be able to perform its accident mitigation function, the consequences of accidents previously evaluated are not increased.

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

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

   The proposed change eliminates the surveillance requirement to verify that the Containment Spray System spray nozzles are unobstructed every ten years. The proposed change does not introduce a new method of plant operation, does not involve a physical modification to the plant, nor does it introduce any accident initiators.

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

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

   The margin of safety in this case is the assurance of operability of the Containment Spray System. Calvert Cliffs' system design, Foreign Material Exclusion practices during maintenance and material accountability following maintenance, and post-maintenance testing practices ensure that the system is free of foreign material that could significantly reduce its ability to perform its intended function. These requirements, along with the remote physical location and the simple construction of the spray nozzles, provide assurance that the nozzles will remain operable.

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

As discussed, we have considered the possibility of significant hazards associated with this change and have determined there are none. We have also determined that operation with the proposed amendment would not result in any significant change in the types or amounts of any effluents that may be released offsite, nor would it result in any significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment is eligible for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is needed in connection with the proposed amendment.

Our Plant Operations Safety Review Committee and Offsite Safety Review Committee have reviewed these proposed changes to the Technical Specifications and our determination of significant hazards. They have concluded that implementation of these changes will not result in an undue risk to the health and safety of the public.

Our next ten-year test is scheduled to be performed in our 2004 refueling outage. We request approval of this change by March 1, 2004 so that it will be in effect at the start of the outage.

PRECEDENT

- H. B. Robinson – approved September 19, 2002
- North Anna Power Station – approved October 1, 2002
- Clinton Nuclear Plant – approved March 28, 2002
- Byron/Braidwood Nuclear Stations – approved February 20, 2003
- Surry Power Station – approved December 10, 2002
- Beaver Valley Power Station – approved February 24, 2003
- Salem Nuclear Power Plant – approved October 10, 2002
- Palisades Nuclear Station – approved February 24, 2003

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

Very truly yours,

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

I, George Vanderheyden, 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.

Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of St. Mary's, this 14th day of July, 2003.

WITNESS my Hand and Notarial Seal:

Janet L. Kelly
Notary Public

My Commission Expires: March 25 2007
Date

GV/EMT/bjd

Attachment: (1) Technical Specification Marked-up Page

cc: J. Petro, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
G. S. Vissing, NRC
H. J. Miller, NRC
Resident Inspector, NRC
R. I. McLean, DNR

ATTACHMENT (1)

TECHNICAL SPECIFICATION MARKED-UP PAGE

3.6.6-4

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
~~SR 3.6.6.8 Verify each spray nozzle is unobstructed.~~	~~10 years~~