

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

July 22, 2002

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 02-306A
NL&OS/ETS R1
Docket Nos. 50-280/-281
License Nos. DPR-32/-37

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
REQUEST FOR ADDITIONAL INFORMATION
PROPOSED TECHNICAL SPECIFICATION CHANGES
CONTAINMENT SPRAY AND RECIRCULATION SPRAY NOZZLES
SURVEILLANCE FREQUENCY

In a May 14, 2002 letter (Serial No. 02-306), Virginia Electric and Power Company (Dominion) requested amendments, in the form of changes to the Technical Specifications to Facility Operating Licenses Numbers DPR-32 and DPR-37 for Surry Power Station Units 1 and 2, respectively. The proposed changes will revise the surveillance frequency of the Containment Spray and Recirculation Spray System spray header nozzles from a periodic surveillance to a performance-based surveillance. In a July 8, 2002 telephone conference call, the NRC staff requested additional information to complete the review of the proposed amendments. The attachment to this letter provides the requested information to support the proposed Technical Specifications amendments.

As noted in our initial submittal, a periodic surveillance test of the spray nozzles is currently scheduled for the Unit 1 Spring 2003 refueling outage. To permit effective outage planning, it is requested that the NRC approve the proposed Technical Specification changes by the end of 2002.

If you have any further questions or require additional information, please contact us.

Very truly yours,



Leslie N. Hartz
Vice President – Nuclear Engineering

Attachment

Commitments made in this letter: None

ADD1

cc: U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
Suite 23T85
61 Forsyth Street, SW
Atlanta, Georgia 30303

Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

Commissioner
Bureau of Radiological Health
1500 East Main Street
Suite 240
Richmond, VA 23218

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Leslie N. Hartz, who is Vice President - Nuclear Engineering, of Virginia Electric and Power Company. She has affirmed before me that she is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of her knowledge and belief.

Acknowledged before me this 22nd day of July, 2002.

My Commission Expires: March 31, 2004.



Notary Public

(SEAL)

Attachment

**Request for Additional Information
Containment Spray and Recirculation Spray Nozzle
Technical Specification Surveillance Frequency Change**

**Surry Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)**

NRC Question 1

“Experience at D. C. Cook, Units 1 and 2 (Licensee Event Report (LER) 98-027-02) indicates that boric acid plate-out with the potential to block flow through the containment spray headers and nozzles can occur following an inadvertent spray actuation.

- (a) Please indicate if there ever has been an inadvertent actuation of the containment spray at Surry Power Station.
- (b) If an inadvertent actuation of containment spray had occurred, describe the type of inspection that was done of the spray system, including piping and nozzles, and what other steps were taken to ensure that no boric acid plate-out occurred.
- (c) If an inadvertent actuation of containment spray had not occurred, describe what type of inspection would be conducted following an inadvertent spray actuation including why this method is sufficient to detect blockage due to boric acid plate-out.”

Response to 1(a), (b), and (c):

Based on a review of the LER submittals, Surry has not had any actuations of the Containment Spray or Recirculation Spray System. If an inadvertent actuation were to occur with injection of borated water through the spray ring header, a Plant Issue would be initiated which would require an evaluation of the circumstances and appropriate corrective actions to ensure the spray nozzles are operable and prevent recurrence. Corrective actions may include performance of an air/smoke flow surveillance test to ensure the spray nozzles are not obstructed and capable of performing their safety function.

NRC Question 2

“Experience at D. C. Cook, Units 1 and 2 (LER 98-027-02) indicates that the typical test for blockage in the containment spray lines and nozzles may not be effective in detecting debris in the spray lines at the amounts reported in this LER.

Please indicate if your testing records show any evidence that the containment spray flow blockage test may have a sensitivity to debris in the lines or nozzles, which cannot be detected by this test. For example, has construction debris or other debris been found in the containment spray system from later inspections, tests or repair work that was not discovered by the containment spray system blockage test required by your technical specifications?”

Response to 2:

UFSAR Sections 6.3.1.5.1 and 6.3.1.5.2 describe testing and inspections performed on the Containment Spray (CS) and Recirculation Spray (RS) subsystems. A partial description of the testing performed on each system is provided below.

During the construction period, the containment spray headers were fitted with blind flanges that allowed the connection of temporary drain lines for initial testing of the subsystem. After the subsystem was completely installed, temporary connections were made to the blind flanges on the spray headers and pipe plugs were placed in the spray nozzle sockets. The containment spray pumps were started and operated over their entire range of flow, circulating water through the spray header supply lines to the spray headers and out the temporary drain connections. This provided a full-system capability test to ensure that the system met the flow requirements. It also provided for a flush of the system to remove any particulate matter that could plug the spray nozzles at a future time. At the completion of this test, the temporary drain connections were removed, the blind flanges replaced, the pipe plugs removed, the nozzle pipe nipples inspected, and the spray nozzles installed. After installation of the nozzles, a nozzle air test was conducted and verified that the spray nozzles remained unobstructed after the full-flow testing. The CS system pre-operational flow and air tests established that the CS spray headers and spray nozzles were free of debris and the spray nozzles were unobstructed. (UFSAR 6.3.1.5.1)

The initial test for the recirculation spray subsystem included a system flush, a pump shutoff head verification, and an air flow test of the spray header. The RS system flush and air tests assured that the system was cleared of debris, the pump capacities met design, and that the spray headers and nozzles were unobstructed. (UFSAR 6.3.1.5.2)

Based on this pre-operational testing, it is assumed that construction debris was removed from the CS and RS systems prior to declaring them operable. Subsequent air/smoke tests performed to date have not identified any nozzle blockage caused by debris in the spray ring headers. These air tests are performed using an air compressor with a minimum capacity of 1200 cfm to verify the nozzles are unobstructed.

During the steam generator replacement projects for Surry Units 1 and 2 the CS spray header outside the crane wall was added and spray nozzles were replaced in the CS System. A portion of the nozzles were replaced with blanks in the RS spray headers. These modifications were completed to address containment depressurization and spray pump net positive suction head issues. Prior to declaring the system operable, the spray header outside the crane wall was flushed to remove debris, and an air test was performed to verify the nozzles were unobstructed. The stainless steel replacement nozzles are screwed onto the header, which eliminated any potential for weld debris.

Other than the modifications noted above, there was no other testing or maintenance activity that breached the spray system headers. During review of design changes associated with the Containment Spray System, we identified that the spray nozzles are stainless steel and not brass as noted in the initial Technical Specification change request dated May 14, 2002 letter (Serial No. 02-306).

NRC Question 3

“Describe any previous maintenance activities on the containment spray system that had the potential to introduce debris. What assurance is there that no such debris presently exists (including debris from construction)?”

Response to 3:

As indicated in our initial correspondence (Serial No. 02-306), the maintenance and test history since the last air/smoke test was reviewed to identify any activity that could have inadvertently introduced debris into the Containment Spray and Recirculation Spray Systems. This review concluded that the maintenance/testing activities that were performed since the last air/smoke test of the spray nozzles have not introduced debris into the spray ring headers for either system. This conclusion is based on the administrative controls implemented for the Foreign Material Exclusion (FME) program, as described in the response to Question 4. Implementation of the FME program ensures that debris is not introduced into systems when they are opened for periodic maintenance. In addition, the pre-operational testing performed on the Containment Spray and Recirculation Spray Systems, as described in response to Question 2, ensures any construction related debris was flushed from these systems prior to declaring them operable.

NRC Question 4 (a)

“Describe how the plant’s foreign material exclusion program would prevent debris from remaining in the containment spray system piping, headers and nozzles following maintenance, testing or inspections which result in opening the system.”

Response to 4(a)

Virginia Power Administrative Procedure (VPAP) 1302, Foreign Material Exclusion Program, provides administrative guidelines to prevent the introduction of foreign material, (e.g., maintenance residue, dirt, debris, and tools) into open systems or components during maintenance and maintenance related activities. Foreign material exclusion (FME) controls are required to be established any time a system/component is opened for maintenance, regardless of size. If it is determined that FME controls are not required, this is documented in the work package. Only qualified workers may perform work independently in a FME area. A qualified worker must escort non-qualified personnel while in a FME designated boundary area. The following provides a partial list of attributes for the FME Program as described in VPAP 1302.

- The component/system being opened is inspected as soon as it is open to note any missing or damaged parts and components prior to starting work.
- No clear plastic, poly sheeting, or other transparent materials shall be taken into an FME area unless it is clearly marked in such a way that it is no longer transparent.

- Tools and equipment are required to be fail-safe and logged in/out as necessary.
- Consumables must be used in accordance with approved Consumable Material Evaluations. If a container must be taken into the work area then all parts are made fail-safe.
- The following guidelines are provided for maintaining cleanliness during work activities on open systems/components:
 - a. Whenever possible, the system cavity should be drained, wiped clean, and allowed to dry.
 - b. Whenever possible, the accumulation of dirt and debris should be reduced by using methods that effectively shrink the work area as follows:
 - Blocking pipe runs by using dams or baffles.
 - Coating the walls of the cavity with a protective film or cover that can be peeled off once work is completed.
 - Installing a cover prior to scraping or cleaning gasket surfaces.
 - c. Prior to grinding or using a wire wheel with air tools the spread of debris should be reduced by scraping, vacuuming, and wiping up loose debris.
 - d. Inspect tools and materials required for the activity to ensure they are clean and in good condition. Any cables, cords, or hoses with deteriorated, aged, or spalled surfaces shall not be used.
 - e. Internal and external surfaces of replacement parts and parts removed for repair should be thoroughly cleaned before installing or reinstalling the item in the system/component.
 - f. Cleaning tasks that increase system cleanliness should be performed immediately before starting another stage of the task.
 - g. When performing lapping or mechanical seat repair to valve seats, internal plugs should be installed whenever possible. All lapping compound and filings must be removed from the system component using approved solvents. All bluing should be removed after surfaces have been checked in the same manner.
 - h. Debris that was added by the work process should be removed from the system. Examples include: grinding dust, welding slag, lapping compound, metal chips, tape residue, marking ink, dye penetrant.
 - i. System openings (cavities) should be covered with temporary covers when leaving work area unattended (e.g., end of work shift, work delays) to prevent intrusion of foreign material. The work area shall be cleaned at the end of each shift to ensure entry of foreign material does not occur.
- When temporary systems are to be attached to systems/components that are sensitive to foreign materials, the temporary system components should meet the same cleanliness requirements as the system to which they are being attached.
- A clamshell cutter or grinding to a “blue line” should be used in vertical pipe runs or on any FME sensitive system. The use of a porta-band saw, reciprocating saw, or a cutting torch are not to be used without the consent of the cognizant supervisor. Blueline is that technique where, when a through wall cut of a pipe is desired but you

want to minimize to the greatest extent possible debris entering the pipe, a cut is made externally on the pipe surface toward the pipe internal surface. As you cut deeper into the pipe, the friction of the cutting tool will cause the base metal remaining to be cut to turn blue just prior to entering the pipe. At this point, the cutting evolution is stopped and the process repeated for the remaining portions of the area to be cut until a blue line encircles the pipe. To complete the through wall cutting of the pipe, a sharp chisel is used at the blue line to establish separation of the base metal.

- Guidelines have been established for a loss of FME control and include initiation of a Plant Issue upon discovery of loss of FME control. These actions would be taken for a discrepancy in the FME Control Log or if it is suspected that foreign material has been introduced into the component/system.
- A closeout inspection shall be performed by an appropriately certified inspector prior to system/component closure for safety related and NSQ piping, valves, oil reservoir, and flanges, greater than 2 inches nominal size. The closeout inspection is documented with the work order that authorized the maintenance activity.
- Station management review of the effectiveness of the FME Program in their respective departments shall be conducted by periodically monitoring work activities involving cleanliness of open systems and components, reviewing internal and external audit reports related to the FME Program, and reviewing the number of items unaccounted for during FME area activities.

These administrative controls are considered to be sufficient to assure foreign material is excluded from open systems and components during maintenance and maintenance related activities.

NRC Question 4(b)

“Demonstrate why your foreign material exclusion program is sufficient, following any opening of the system, to ensure that nothing remains in the system sufficient to block the system and cause a decrease in spray flow. Shouldn’t a blockage test be run to provide a defense in depth that the containment spray system is still capable of performing its safety function after the system is opened?”

Response to 4(b)

The attributes of the FME Program described above provide adequate assurance that debris or foreign material will not be left in the Containment Spray or Recirculation Spray System that could significantly reduce the system's ability to perform its intended function. When the spray systems are opened for maintenance or testing, appropriate FME controls are established to ensure the system is free of debris. In addition, post-maintenance testing is performed on the active components (pumps and valves) which further confirms that the system is free of debris and establishes that the system is fully operable. From a review of records, there has been no maintenance on the spray

headers or the spray nozzles that could have caused any debris or blockage of the spray nozzles that has not been addressed by initial testing and the FME program.

As for the prudence of performing a Technical Specification air/smoke surveillance test after every maintenance activity, it is noted that the air/smoke spray nozzle test only establishes that the piping and nozzles in the spray system headers are unobstructed. Therefore, performing an air/smoke test of the spray systems' headers and spray nozzles would not provide any significant increase in the assurance that the spray systems could perform their intended safety function after another portion of the spray system (e.g., pumps, valves, heat exchangers etc.) was opened. Regardless, if a spray ring header is opened for maintenance, the Post Maintenance Testing Matrix will require an evaluation to be performed of the work activity to determine if an air/smoke test is warranted even with the FME controls in place to preclude the entry of materials that could cause nozzle obstruction.

NRC Question 4(c)

“Following maintenance on a component of the containment spray system, what specific criteria are used to determine whether a flow blockage test of the containment spray system is required? At what level of management is this decision approved?”

Response to 4(c)

As indicated in our initial correspondence, an initial evaluation of the spray systems has been performed to determine those portions of the spray systems that an air/smoke test could be used to verify that the nozzles remain unobstructed after maintenance or testing. The Post Maintenance Testing (PMT) matrix will be modified to address the need for a specific engineering evaluation to determine if a spray nozzle inspection or test is necessary after maintenance on those portions of the spray systems identified in the initial evaluation as noted above.