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Nebraska Public Power District

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June 1, 2011

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REGION IV

Nuclear Regulatory Commission
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USC 552(b)(4) Attn: Nick Taylor, (b)(4),Blank
612 East Lamar Blvd., Suite 400
Arlington, Texas 76011-4125

USC 552(b)(4) Subject: (b)(4),Blank

Reference: Nuclear Regulatory Commission Letter from Nicholas H. Taylor to Mr. Brian J. O'Grady, Nebraska Public Power District, dated May 6, 2011,
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The purpose of this letter is to provide the results of Nebraska Public Power District's (NPPD) evaluation as requested by the referenced letter.

The attached report provides information regarding: 1) the independece of the individual(s) conducting the investigation from the organization affected by the concern; 2) the proficiency of the evaluator(s) in the related functional area; and 3) the depth and scope of the evaluation. USC 552(b)(4) (b)(4),Blank a root cause or apparent cause analysis was not performed and no corrective actions were determined necessary.

If you have any questions or require additional information, please contact Norena Robinson, Employee Concerns Coordinator at 402-825-5643.

Brian O'Grady
Vice President-Nuclear and Chief Nuclear Officer

/nr

Attachments:
1) Evaluation Report

Enclosures:
1) Burns & Roe Drawing 2011, JELCO Drawings 2825-1, 2825-2, X2825-201, and X2825-202
2) CNS Procedures 6.1DG.101, Diesel Generator 31 Day Operability Test (IST) (DIV 1); 6.2DG.101, Diesel Generator 31 Day Operability Test (IST) (DIV 2); 6.1DG.401, Diesel Generator Fuel Oil Transfer Pump IST Flow Test (Div 1); and 6.2DG.401, Diesel Generator Fuel Oil Transfer Pump IST Flow Test (DIV 2).
3) CNS Technical Specification SR 3.8.1.6
4) Diesel Fuel Oil Underground Piping Integrity Test Data

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Enclosures (Cont.)

5) Station Blackout Coping Assessment for the Cooper Nuclear Station
6) CNS Procedure 2.2.100, SAMG Diesel Generator System
7) Map of Severe Accident Diesel and its Storage Locations, Installed Position, and Cable Installation.
8) NEDC 10-063, "Probable Maximum Flood Hydraulic Evaluation"
9) CNS Maintenance Procedure 7.0.11, "Flood Control Barriers"
10) CNS Emergency Operating Procedure 5.1Flood, "Flood"
11) CNS Emergency Operating Procedure 5.8, "Emergency Operating Procedures (EOPS);" Severe Accident Procedure 5.9SAMG, "Severe Accident Management Guidance;" Emergency Procedure 5.2FUEL, "FUEL FAILURE;" System Operating Procedure 2.2.74, "Standby Liquid Control System"
12) NEDC 07-071, "Review of Alion Calculation ALION-CAL NPPD-3236-003, Cooper Nuclear Station Post-Accident Suppression pH Analysis"

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Issue 1

For the emergency diesel generator fuel-oil tank and associated underground piping, maintenance has been inadequate to protect against flooding.

1. *What is the configuration of underground piping of the emergency diesel generator fuel oil tank and transfer system from the fuel oil storage tank to the day tank? Please provide piping and instrument diagrams.*

Evaluation

The underground piping of the emergency diesel generator fuel oil contains approximately 1000 feet of buried piping between the diesel fuel storage tanks and the diesel rooms. The piping is 2 inch schedule 40 carbon steel with an external protective coating. The piping is connected to the cathodic protection system and is approximately 8 to 10 feet below the surface grade.

The flow drawing for the underground diesel fuel oil piping is Burns & Roe Drawing 2011. The isometric drawings are JELCO Drawings 2825-1, 2825-2, X2825-201, and X2825-202. (See Enclosure 1)

2. *How does Cooper Nuclear Station inspect for flaws in the diesel fuel oil underground piping?*

Evaluation (cont)

CNS performs quarterly checks of piping integrity during pump testing. These checks are performed by comparing the amount of fuel that is pumped from the diesel fuel storage tanks to the amount of fuel that is received in the diesel fuel day tanks.

CNS has also inspected the buried diesel fuel oil piping in 2004 and 2005. The inspections included excavating a section of the piping, performing a visual inspection of the coating, and performing inspection of piping thickness. A summary of results of these inspections is provided in the response to question number six.

3. *How is the emergency diesel generator underground piping system leakage test performed? Please provide the procedure used to complete the test.*

Evaluation (cont)

The CNS diesel generator underground piping integrity check is performed per CNS Procedures 6.1DG.101, "Diesel Generator 31 Day Operability Test (IST) (DIV 1)"; 6.2DG.101, "Diesel Generator 31 Day Operability Test (IST) (DIV 2)"; 6.1DG.401, "Diesel Generator Fuel Oil Transfer Pump IST Flow Test (Div 1)"; and 6.2DG.401, "Diesel Generator Fuel Oil Transfer Pump IST Flow Test (DIV 2)". These checks are performed by comparing the amount of fuel that is pumped from the diesel fuel storage tanks to the amount of fuel that is received in the diesel fuel day tanks. (See Enclosure 2)

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4. *What standards (ASME, ANSI, B31.1 etc.) are used to perform the system leakage test for the diesel fuel oil underground piping?*

The diesel fuel oil underground piping integrity is checked during the Diesel Generator Fuel Oil Transfer Pump IST Test which is performed in accordance with ASME Code for Operation and Maintenance of Nuclear Power Plants to satisfy CNS Technical Specification SR 3.8.1.6. (See Enclosure 3)

Evaluation (cont)

5. *What is the frequency of the system leakage tests? Please provide results of all tests that have occurred in the previous 10 years.*

Evaluation (cont)

The diesel fuel oil underground piping integrity is checked quarterly during the Diesel Generator Fuel Oil Transfer Pump IST Test. Since there is a large volume of fuel for each increment of storage tank level, the effect of the measurement uncertainty of the tank level readings can provide varying results. Therefore, the results are used to identify a declining trend as opposed to an absolute value. The available data is provided from the System Engineering Trend Plan which records data from the completed procedures. No declining trend has been identified. (See Enclosure 4)

6. *Has any maintenance, modification, or replacement of the underground portion of diesel fuel oil system occurred since initial operation of Cooper Nuclear Station? If so, please provide the history of maintenance detailing the nature of work completed.*

Evaluation (cont)

August 2004 – Inspection of diesel fuel oil underground piping.

Inspection included an excavation of an area of buried piping between the storage tank and the diesel room, visual inspection of the coating, and removal of coating to perform UT thickness readings on piping. Results of the inspection identified one location of coating damage due to external impact and three areas of rust on coating. The coating was removed at these locations and UT thickness readings were taken. All locations had acceptable thickness and only the area of external impact had measurable corrosion. The inspection included sections of diesel fuel oil piping to both diesels.

August 2005 – Inspection of diesel fuel oil underground piping.

Inspection included excavation of an area of buried piping between the storage tank and the diesel room, visual inspection of the coating, and removal of coating to perform guided wave and thickness readings on piping. Results of the inspection revealed that the observable surface of the pipe was in good condition. The A-scan UT thickness measurements showed that the pipe thickness was within +/- 0.003 inches of the nominal wall thickness (i.e., well within the thickness tolerance for new pipe). The G-scan detected the pipe welds and intermittent contact with concrete but no indications of metal loss were detected. The inspection included sections of diesel fuel oil piping to both diesels.

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In Progress – Installation of cathodic protection modification.

The modification includes installation of new distributed anode beds and rectifiers to replace the existing cathodic protection system in order to provide enhanced cathodic protection to CNS buried piping including the buried diesel fuel oil piping. The new system is currently in operation and is in the post modification adjustment phase.

Issue 2

For the station blackout battery, the coping time is not adequate.

1. What is the elevation of the station blackout batteries?

Evaluation

CNS does not have dedicated Station Blackout (SBO) batteries. The safety related batteries are credited as the SBO batteries. They are located on battery racks on the Control Building 903 feet 6 inch elevation (grade floor level).

2. Can Cooper Nuclear Station shutdown and cool down the plant during station blackout coping timeframe? Please provide the station blackout coping analysis.

Evaluation (cont)

Yes. See enclosed coping analysis. (See Enclosure 5)

3. Does Cooper Nuclear Station have guidelines for connecting the severe accident diesel to the station blackout battery charger? If so, please provide those guidelines.

Evaluation (cont)

Yes. See CNS Procedure 2.2.100, "SAMG Diesel Generator System." (Enclosure 6)

4. With the new or revised flood levels of the Missouri River, will this affect the movement of the severe accident diesel generator from its storage location to its specified location?

No. The CNS Probable Maximum Flood (PMF) is established at 903 feet elevation. The storage location of the severe accident diesel (turbine building truck bay) is at elevation 903 feet 6 inch while the elevation of the severe accident diesel when connected, is at the station site grade level of 903 feet. Therefore, it is not anticipated that movement of the severe accident diesel will be impeded by the PMF levels.

5. Please provide a map of the storage locations, installed position, and cable installation of the severe accident diesel and its connections.

Evaluation (cont)

See enclosed map for locations, installed position, and cable installation of the severe accident diesel and its connections. (Enclosure 7)

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6. *When connecting the severe accident diesel generator to the battery chargers, what is the greatest distance that can be achieved by the cable?*

Evaluation (cont)

The cable length (approximately 150 feet) is sized to connect the severe accident diesel to the load with sufficient slack for ease of installation.

Issue 3

For a flooding scenario, the planned compensatory measures and emergency operating procedures are inadequate

1. *What are your plans to update flood protection and emergency operating procedures because of new information from the Upper Mississippi River System Flow Frequency Study published by the US Army Corps of Engineers in January 2004?*

Evaluation

Cooper Nuclear Station (CNS) has reviewed The Upper Mississippi River System Flow Frequency Study and has concluded that it contains no new information indicating the current CNS flood protection measures are inadequate. The highest water surface elevation the study reported near CNS was the 500-year event at 903.8 ft Mean Seal Level (MSL). While this is above the PMF Probable Maximum Flood (PMF) elevations established by the Corps of Engineers during the Plant's original design, it is below the 906-ft MSL flood for which the station has the mechanisms in place and the coping capability to withstand.

The CNS site was elevated 13-ft above the natural flood plain to elevation 903-ft MSL. Grade level floors and openings into Safety Related Buildings are elevated further to 903.5-ft MSL. CNS has procedures in place to erect barricades to protect from flooding events resulting in water surface elevation up to 906-ft MSL.

CNS has embarked on a flood barrier improvement project. This project will include new barriers and controlling procedures. The new barriers will be more robust, provide a more reliable seal, and will be quicker and simpler to install. Where practical, it is intended to gain further margin by increasing the protected height above elevation 906 feet MSL.

2. *Please provide a copy of the new design basis flood analysis at Cooper Nuclear Station that was conducted as a product of new information in the Upper Mississippi River System Flow Frequency Study.*

Evaluation (cont)

CNS has not completed a new design basis flood analysis; however, in July 2010, CNS contracted with a Consulting Civil Engineer/Hydrologist (FTN Associates) to perform a review of the 2004 Upper Mississippi River Study as it relates to CNS and to perform additional modeling. FTN Associates created a hydraulic computer model (based on an existing Federal Emergency Management Agency model) to estimate the PMF height based on the flow rates established by Corps of Engineers during CNS's original design and licensing. The results of this study are

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documented as CNS calculation NEDC-2010-063 (See Enclosure 9). It was decided that the results of this calculation did not challenge the current PMF determination; however, it was also concluded a more detailed approach less sensitive to assumptions regarding conveyance area would be needed to thoroughly assess the situation.

In January 2011, CNS again contracted with FTN Associates to develop a more detailed model and study. To facilitate the study, CNS aerial contractors completed high resolution LiDAR Mapping of the Missouri River Floodplain, bluff to bluff from the confluence with the Nishnabotna River upstream of the plant, to Rulo, Nebraska downstream of the plant.

CNS also contracted with the US Army Corps of Engineers to review the current CNS PMF determination and to act as a third party review of FTN Associates model and study.

FTN Associates has reported preliminary results to CNS that appear to support the original analysis in the CNS USAR. This report is currently under review by the US Army Corp of Engineers.

3. *What changes were made to your existing emergency operating procedures when new flood information was received?*

Evaluation (cont)

Enhancements to current CNS flood barrier procedures were made as focus on this issue led to a review of barrier construction practices. A more robust barrier has been incorporated into CNS Procedure 7.0.11 (See Enclosure 9). This included the overlapping of the sandbags, additional wood bracing, and filling of the sandbags per the Army Corps of Engineers guidance.

4. *How does Cooper Nuclear Station protect the site, emergency diesel generators, and other nuclear safety related systems against the 100 year flood?*

Evaluation (cont)

CNS is designed to accommodate the PMF, which is a flood of a greater magnitude than the 100-year event.

The 100-year Flood elevation near CNS as reported in the US Army Corps of Engineers 2004 Upper Mississippi Flood Frequency Study is approximately 901-ft MSL. The ground surrounding the main plant complex at CNS is elevated to 903-ft MSL. The minimum external openings into buildings that contain the Emergency Diesel Generators and the buildings which contain safety related equipment needed to achieve and maintain safe shutdown are elevated half a foot higher at elevation 903.5-ft MSL.

Additional protections should flood elevation exceed 903.5-ft MSL are available through the erection of the flood barriers at the exterior grade openings as discussed to the response to question 3 above.

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Issue 4

The Cooper Nuclear Station accident scenario response is not adequate.

1. *In a flooding accident scenario, what is the control room response to ensure that the reactor is in a safe shutdown condition if the ultimate heat sink and diesel generators are lost in a flood event?*

Evaluation

The CNS USAR states the following:

> "The station site grade level of 903 feet MSL has been raised 13 feet above the natural grade level of 890 feet MSL, in order to bring final grade one foot above the existing 902 feet MSL levee constructed by the Corps of Engineers. This levee was raised above its original design level and presently has a three foot minimum free board over the 1952 flood of record (899 feet MSL). Flooding of the station is considered to be extremely unlikely due to the combination of upstream Missouri River flood control and the high final site grade. With respect to the 1,000 year, 10,000 year and 1,000,000 year Probable Maximum Flood (PMF) floods, these water levels will provide 3.5 feet, 1.5 feet, and 6 inches of freeboard respectively below the 903 feet 6 inch grade floor elevation of the principle structures."
>
> "...offsite power is not required for safe plant shutdown. There is sufficient fuel in the Diesel Oil Storage Tanks to assure seven days of operation of a single diesel generator powering a single critical division of safe shutdown loads. This time duration is sufficient to obtain more fuel, if needed. The two storage tanks are buried and their appendages are protected by a substantial cover. The manholes providing access to the Diesel Oil Transfer Pumps, the capped fill connections and the tank vents are all located above 906 feet MSL. The design and installation of the tanks assure flotation does not occur when empty during the PMF."
>
> "The Atomic Energy Commission (AEC) staff independently evaluated the flooding potential at CNS. They estimated PMF to be 901.2 feet MSL, which concurrent with wind effects would result in a maximum water level on the outside of the Intake Structure at 909.2 feet MSL (PMF plus wave effects) and 905 feet MSL (PMF plus surge effects) on other exposed safety related structures. The AEC staff required protection of safety related structures and systems against these levels in order to ensure the capability to place and maintain the plant in a safe shutdown under the flooding conditions described above."
>
> These levels will not cause any direct flooding problems to any equipment required for the safe shutdown and cooldown of the reactor when the site flooding procedure as outlined above is in use. The 901.2 foot MSL water surface elevation and the 905 foot MSL (PMF plus surge effects for safety related structures other than the Intake Structure) estimated by the AEC staff are below the 906 foot MSL projected for the unlikely combination of an upstream dam failure concurrent with the maximum natural flood. "

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"The maximum water level on the outside of the Intake Structure of 909.2 feet MSL (PMF plus wave effects) will not affect safe operation of the Service Water pump motors. The Intake Structure is built with a floor elevation of 903 feet 6 inch MSL. The Service Water pump motors are positioned approximately 4-1/2 feet above the floor and are protected by 24 inch concrete walls to an elevation of 919 feet MSL. Therefore, direct wave action will be dissipated and the water level in the room would be below the elevation of the Service Water pump motors."

As noted in the USAR, CNS has developed a site flood plan. This plan has been incorporated into Emergency Procedure 5.1FLOOD, FLOOD. CNS enters Emergency Procedure 5.1FLOOD (Revision 10, Enclosure 10), under the following conditions:

- River level ≥ 895 feet MSL.
- Notification of an upstream dam failure.
- River level is forecast to be ≥ 902 feet MSL within next 36 hours.

Emergency Procedure 5.1FLOOD directs primary flood barriers to be established at a river level of 898 feet MSL or if forecast to be ≥ 902 feet MSL within next 36 hours and secondary flood barriers to be established at a river level of 900 feet MSL or forecast to be ≥ 902 feet MSL within next 36 hours.

Step 4.1 of Emergency Procedure 5.1FLOOD directs the reactor be shutdown if any of the following conditions occur:

- River level at 902 feet MSL or forecast to be ≥ 902 feet MSL within next 36 hours.
- Flood water accumulates in any of following:
  - Either Diesel Generator Room.
  - Any Reactor Building Quadrant.
  - Control Building Basement.
- Plant conditions warrant reactor shut down.

Step 4.2 of Emergency Procedure 5.1FLOOD directs the following once the reactor is de-pressurized:

- Maintain reactor head vents open.
- Raise water level in reactor vessel to near top head to establish a flooded vessel condition.
- Establish backfeed from normal transformer to Bus 1A and Bus 1B per Procedure 2.2.18.

These actions ensure the plant is shutdown before any equipment required for safe shutdown and cooldown is affected by flood waters.

In the unlikely event that the emergency diesel generators (and the ultimate heat sink) are lost in a flood event the following actions would be taken:

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Off site power would be utilized until it is no longer available, including backfeed from the normal transformer. Once all AC power is lost, Emergency Procedure 5.3SBO, Station Blackout, would be entered. This procedure directs that the Supplemental Diesel Generator (SDG) be placed in service. The SDG System provides a reliable source of power for one critical bus in the event all other power supplies are unavailable. SDG load capacity is sufficient to power selected loads in order to maintain the plant in Mode 3 and conduct a cooldown to Mode 4 when desired. The SDG and associated equipment are unaffected by flood conditions up to a water level of 906.5 feet MSL. Additionally, Emergency Procedure 5.3SBO directs installation and operation of the Severe Accident Management Guideline (SAMG) Diesel Generator. The SAMG diesel generator is a self-contained 175 kW, trailer mounted unit that will be used to provide power to both "C" battery chargers (swing chargers) and portable Battery Room ventilation fans. The SAMG DG is capable of operating at full load for at least 24 hours without refueling. While the SAMG DG is not credited for meeting the SBO rule, it does extend the capacity of the station batteries it is connected to.

If the SDG is or becomes unavailable, operation per Emergency Procedure 5.3SBO continues. CNS has been analyzed to meet the requirements of 10CFR50.63 for a four hour coping duration. The initiating event is simply assumed to be a sudden loss of offsite power with turbine trip. The analysis assumes that prior to the event, the reactor is operating at 100% power and has been doing so for at least 100 days. No other independent accidents or events are assumed to occur, unless they result directly from the loss of power. The sequence of events is assumed to occur as follows:

Time = 0:
- Reactor scram
- PCIS groups I, II and III (and VI and VII)
- Auto start signals to both DGs

0 < Time < 10 minutes:
- All rods full in, power to decay heat levels
- DGs fail to start
- RR pumps trip
- RPV pressure control via Low-Low Set
- RPV water level lowers due to loss of Feed and Condensate
- HPCI and RCIC auto start
- RPV water level recovers
- HPCI and RCIC trip at Level 8
- HPCI manually secured by the operator to prevent further operation

10 minutes < Time < 2 hours:
- Operators take compensatory measures and reduce DC electrical loads (to enhance cooling in rooms credited in coping analysis)
- RCIC used to control RPV level for remainder of SBO until power restored from on- or off-site power

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2 hours < Time < 4 hours:

- RPV level maintained with RCIC
- Activities continue to restore both on-site and off-site power

In addition to guidance contained in Emergency Procedure 5.3SBO, Station Blackout, operations personnel would be monitoring for entry conditions into the Emergency Operating Procedures (EOPs) and Severe Accident Management Guidance (SAGs). In this event (station blackout), the focus of the operating crew would be RPV control and primary containment control. While RCIC is operating, the crew would be in a monitoring mode for RPV control with RPV level being controlled by RCIC. RPV pressure will be controlled with both RCIC operation and SRV operation. Primary containment pressure and temperatures would be rising during RCIC operation but the crew's response would be limited due to the loss of AC power. It would be recognized by the crew that RCIC operation would be lost at some time after 4 hours due to depletion of the station batteries (assuming Supplemental Diesel Generator and SAMG DG not available). Using Procedure 5.3ALT-STRATEGY, ALTERNATE CORE COOLING MITIGATING STRATEGIES, the crew will transition to manual RCIC operation. Manual RCIC operation does not require any DC power for RCIC to operate. Primary containment pressure and temperatures would be still be rising. Recognizing this will lead to emergency depressurization at some point, the crew would began to make available a low pressure injection source per Procedure 5.3ALT-STRATEGY. Procedure 5.3ALT-STRATEGY contains several methods of injection from low pressures sources utilizing the fire protection system or portable pumps. Eventually, primary containment parameters (EOP 3A) will require emergency depressurization. Once emergency depressurization lowers RPV pressure enough, injection from the low pressure source will commence and RPV level will be restored and maintained.

2. *What are your procedures for use of the standby liquid control system in loss-of-coolant accident, station blackout, and flood events? Please provide the procedures.*

Evaluation (cont)

The following CNS procedures provide guidance for operation of the standby liquid control system; however, only Emergency Procedure 5.2FUEL, FUEL FAILURE, is specifically credited in one of the three events, i.e., the loss-of-coolant accident, for standby liquid control system operation. The Emergency Operating Procedures (EOPS) and Severe Accident Management Guidance would be used any time when the entry conditions are met. See the following procedures (Enclosure 11).

Emergency Operating Procedure 5.8, "Emergency Operating Procedures (EOPs)"
Severe Accident Procedure 5.9SAMG, "Severe Accident Management Guidance"
Emergency Procedure 5.2FUEL, "FUEL FAILURE"
System Operating Procedure 2.2.74, "Standby Liquid Control System"

3. *Please explain how and when the standby liquid control system is used during a loss-of-coolant accident, station blackout, and flood events. Please describe the basis for those plans.*

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Evaluation (cont)

Loss-Of-Coolant Accident: Injection of SLC is credited for controlling Suppression Pool pH after a DBA LOCA. The SLC System injection is required to be initiated within 6 hours and complete the injection of Sodium Pentaborate Decahydrate within 8 hours following a Design-Basis LOCA in order to maintain the pH of the Suppression Pool > 7.0. This requirement supports the assumptions made in the Alternate Source Term LOCA Analysis.

Station Blackout: The standby liquid control system is not credited for this event.

Flood Event: The standby liquid control system is not credited for this event.

4. *Please provide the accident analyses for the use of the standby liquid control system and loss-of-coolant accident, station blackout, and flood accident scenarios.*

Evaluation (cont)

As noted above, operation of the standby liquid control system is only credited in the LOCA analysis. See enclosed LOCA analysis, NEDC 07-071, "Review of Alion Calculation ALION-CAL NPPD-3236-003, Cooper Nuclear Station Post-Accident Suppression pH Analysis. (Enclosure 12)

5. *What emergency, abnormal, or severe accident procedures and indications are used to ensure that operators would understand when to operate the standby liquid control system if conditions existed in a loss-of-coolant accident, station blackout, and flood scenario?*

Evaluation (cont)

As noted above, operation of standby liquid control system is only credited in the LOCA analysis. Emergency Procedure 5.2FUEL, FUEL FAILURE, contains specific guidance for when standby liquid control system injection is required following a loss-of-coolant accident. Step 4.10 of Emergency Procedure 5.2FUEL states the following:

NOTE – SLC System injection is required to be initiated within 6 hours and complete injection within 8 hours following a Design-Basis LOCA to support AST LOCA Analysis.
If both following conditions exist, inject STANDBY LIQUID CONTROL per Procedure 2.2.74:

- Drywell pressure > 1.84 psig.
- Drywell radiation monitor > 250 R/hr during LOCA conditions.

Both drywell pressure and drywell radiation indication are available in the Control Room.

The EOPs and Severe Accident Management Guidance (SAG) also direct initiation of the standby liquid control system. EOP and SAG entry conditions and operator actions are keyed to certain plant parameters or symptoms. Actions are specified as appropriate to restore and maintain these key plant parameters to within limits which define safe plant conditions. Identification of an initiating event is not required in order to determine which EOP or SAG should be entered. Likewise, the operator actions specified are appropriate irrespective of the initiating event or the sequence with which subsequent events may occur. In the EOPs and SAGs, standby liquid control system is initiated under the following conditions:

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For reactor power control: When the reactor is not shutdown and before average torus water temperature reaches the boron injection initiation temperature or when the reactor is not shutdown and if periodic neutron flux oscillations exceed 25% peak-to-peak commence and continue.

For RPV level control: When the normal injection systems and the injection subsystems are not sufficient to maintain RPV level above -150" or when primary containment flooding is required (SAG action).

Evaluator(s)

The issues were evaluated by the following individuals:

Robin Jacobs, CNS Operating Experience Coordinator. Mr. Jacobs has over 23 years experience at commercial nuclear facilities and 18 years of experience in Operations as a Senior Licensed Operator. Mr. Jacobs is not in the direct management chain for either the CNS Engineering or Operations Departments.

Mickey Joe, CNS Operations Training Supervisor (Initial). Mr. Joe has 18 years experience in nuclear operations including 6 years in the U.S. Nuclear Navy program, and 12 years at CNS as a non-licensed operator, reactor operator, and senior reactor operator. Mr. Joe has also been a nuclear instructor, fire brigade instructor and is currently the Operations Training Supervisor. Mr. Joe is not in the direct management chain for either the CNS Engineering or Operations Departments.

Mr. Mace holds a BS in Mechanical Engineering and has over 29 years commercial nuclear experience with 5 years in Operations as an SRO-Certified Shift Technical Engineer. Mr. Mace is not in the direct management chain for either the CNS Engineering or Operations Departments.