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PSEG Nuclear LLC

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

SALEM GENERATING STATION UNITS 1 AND 2
DOCKET NOS. 50-272 AND 50-311
FACILITY OPERATING LICENSES NOS. DPR-70 AND DPR-75
60-DAY RESPONSE TO NRC BULLETIN 2003-01
POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS

The U. S. Nuclear Regulatory Commission (NRC) issued NRC Bulletin 2003-01 to inform licensees of the potential for additional adverse effects due to debris blockage of flow paths necessary for Emergency Core Cooling System (ECCS) and Containment Spray System (CSS) recirculation and containment drainage. These additional adverse effects were based on NRC-sponsored research that identified the potential susceptibility of pressurized-water reactor (PWR) recirculation sump screens to debris blockage in the event of a high energy line break (HELB) that would require ECCS and CSS operation in the recirculation mode.

All licensees are requested to provide a response within 60 days of the date of the NRC Bulletin to either:

1) State that the ECCS and CSS recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the NRC Bulletin are in compliance with 10 CFR 50.46(b)(5) and all existing applicable regulatory requirements [Option 1], or
2) Describe any interim compensatory measures that have been or will be implemented to reduce the risk which may be associated with the potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance has been completed [Option 2].

Attachment 1 to this letter contains the PSEG Nuclear LLC (PSEG) Salem Generating Station Units 1 and 2 response to Option 2 of the requested information in U. S. Nuclear Regulatory Commission (NRC) Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," dated June 9, 2003.

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Attachment 2 contains commitments contained in the response, and Attachment 3 provides pictorial representations of the containment sump.

Should you have any questions regarding this response, please contact Howard Berrick at (856) 339-1862.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Executed on 6 August 2003

John Carlin
Vice President - Engineering

Attachments (3)
/HGB

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REQUESTED INFORMATION:

In response to the emergent items associated with the potential post-accident debris blockage concerns identified in this bulletin, the NRC is requesting that individual PWR licensees submit information on an expedited basis to document that they have either:

Option (1) Analyzed the ECCS and CSS recirculation functions with respect to the identified post accident debris blockage effects, taking into account the recent research findings described in the Discussion section, and determined that compliance exists with all applicable regulatory requirements, or

Option (2) Implemented appropriate interim compensatory measures to reduce the risk that may be associated with potentially degraded or nonconforming ECCS and CSS recirculation functions while evaluations to determine compliance proceed.

The NRC staff recognizes that it may be necessary for addressees to undertake complex evaluations to determine whether regulatory compliance exists in light of the concerns identified in this bulletin and the staff is preparing a generic letter that would request this information.

PSEG RESPONSE:

This response addresses Option 2 of the requested Information. The PSEG response discusses 1) the interim compensatory measures that have been implemented (or evaluated) as of the submittal date of the response, 2) plant specific measures implemented that are not discussed in the bulletin, 3) plant specific measures not implemented as of the submittal date and a schedule for implementation, 4) plant specific measures that cannot be implemented until the next refueling outage and the reason that they cannot be implemented, and 5) measures discussed in the bulletin that will not be implemented and the justification for not implementing them.

Sump Description

The design of Salem's containment sump consists of a sump with two compartments, one for the containment sump and the other for the Emergency Core Cooling System (ECCS) sump on the 78' annulus in the containment. The physical arrangement of the sump is shown in attachment 3. The two RHR pumps take suction from the ECCS sump at the 70' elevation. The sump rests on the curb at the 78' 9" level to prevent a direct access of floor debris to the sump. A basket type strainer with 1/8-inch mesh size protects the ECCS portion of the sump from intrusion of debris. An 8.1' x 11.5' x 3.2' high trash rack (shark cage) surrounds the screened basket to prevent large debris beforehand.

The inner and outer annulus trenches drain to the containment sump. The trench baskets have 3/16 " holes. Water entering the trenches passes through the trench baskets and then into the containment sump. Water from the containment sump enters the ECCS sump through 1/8" mesh screen. These trenches combined with the shark cage provide a flow path for the water inventory that has flooded the containment to reach the RHR pump suction.

1. The following interim compensatory measures have been implemented (or evaluated) by PSEG as of the submittal date of the response:

1.1. Operator Training on Indications and Responses to Sump Clogging

Salem has Emergency Operating Procedures (EOPs) 1(2)-EOP-LOCA-5, *Loss of Emergency Recirculation* (LOCA-5) addressing the loss of recirculation capability. Operators are trained on these procedures. The training scenario exposes the operators to a loss of ECCS recirculation due to a loss of the Residual Heat Removal (RHR) system. Training is also performed on the EOP procedure 1(2)-EOP-LOCA-3, *Transfer to Cold Leg Recirculation* (LOCA-3). Recent LOCA-3 training included a loss of containment sump level indication during a Loss of Coolant Accident (LOCA) scenario.

In an event that results in ECCS pump suctions aligned to the containment sump, plant specific instrumentation is monitored by Control Room Operators and given to Technical Support Center (TSC) engineers to recommend corrective actions as necessary. This is in accordance with LOCA-3 and NC.EP-EP.ZZ-0201 (Q), *TSC Integrated Engineering Response* (EPEP-0201).

The instrumentation monitored is as follows:

- Safety Injection (SI) pump flow (FI-922, FI-918)
- SI pump discharge pressure (PI-923, 919)
- SI pump current (IA-5432, IA-5433)
- Containment recirculation sump level (LA-2445)
- RHR (low-head SI) pump flow (FI-946, FI-947)
- RHR (low-head SI) pump current (IA-5001, IA-5002)
- RHR (low-head SI) pump discharge pressure (PI-635, 647)
- Charging discharge pressure (BIT pressure, PI-942)
- Charging pump total flow (FI-917)
- Charging current (IA-5310, IA-5311)
- Containment sump level (LA-2445)
- Containment pressure (PA-5511)

Additional training has been scheduled to specifically address containment sump blockage concerns identified in NRC Bulletin 2003-01. Licensed Operator training will include an overview of the containment sump, effects of debris on the sump

mesh, transport of debris within containment, instrumentation monitoring to detect the onset of sump blockage and contingency recommendations should sump blockage occur. This containment sump training will be conducted for all Salem Licensed Operators with a completion date of April 30, 2004.

The TSC Integrated Engineering Response procedure EPEP-0201 will be enhanced to provide additional guidance to the TSC staff to mitigate the effects of degraded ECCS pump performance if containment sump blockage is indicated or occurs. The enhancements will include adding steps that direct the TSC engineers to make recommendations to the Operations Superintendent based on their evaluation of the following:

- Whether one train of ECCS should be shut down.
- Whether one train of Containment Spray should be shut down.
- Whether RHR flow should be throttled/reduced.
- Whether LOCA-5 should be entered if ECCS flow is degraded.
- Whether the Chemical and Volume Control System (CVCS) Positive Displacement Pump (PDP) cross-connection should be used. Refer to procedure S1(2).OP-SO.CVC-0023, *CVCS Cross-Connect Alignment to Unit 2(1).*

Training for procedure revisions that are made to EPEP-0201 concerning actions to consider for sump blockage that may be occurring or has occurred will be conducted as follows:

- Distribute required reading ("EP Notes") on procedure change(s) to affected TSC Technical Staff by October 15, 2003.
- The EPEP-201 changes will be incorporated into the TSC Duties lesson plan by October 15, 2003.
- An enhancement to the TSC Duties Qualification Guide that covers monitoring containment sump and what to do, as performance item for initial and annual qualification, will be added by October 15, 2003.
- Overviews of Containment Sump issues will be provided at the 2004 TSC Tabletop trainings starting June 2004 and completing by October 2004.

1.2. Procedure Actions that Delay the Switchover to Containment Sump Recirculation

Salem's Emergency Operating Procedures LOCA-3 provides instructions to stop one Containment Spray pump early in the recirculation alignment. The intent of this step is to prolong the time available for the operators to establish the Cold Leg Recirculation alignment prior to depleting the Refueling Water Storage Tank (RWST) inventory. No other pre-emptive actions to reduce ECCS or Containment Spray (CS) are proceduralized.

For larger LOCAs that require ECCS injection flow and containment spray, pre-emptive operator actions to stop pumps or throttle flow solely for the purpose of

delaying switchover to containment sump recirculation are not recommended until the impact of the changes can be evaluated on a generic basis for the following reasons:

- Operator actions to stop ECCS or CS pumps or throttle flow may result in conditions that are either outside of the design basis safety analyses assumptions or violate the design basis safety analyses assumptions (single failure). This would result in the potential for creating conditions that would make the optimal recovery more challenging (e.g., stopping containment spray impacts containment fission product removal, containment sump pH and equipment environment qualification design basis requirements).

- These actions would be inconsistent with the overall Westinghouse Owners Group (WOG) Emergency Response Guideline (ERG) philosophy. The WOG ERGs are symptom-based procedures that provide for the monitoring of plant parameters and prescribe actions based on the response of those parameters. To avoid the risk of taking an incorrect action for an actual event, the WOG ERGs do not prescribe contingency actions until symptoms that warrant those contingency actions are identified.

- These actions would be inconsistent with the current operator response using the WOG ERGs that has been established through extensive operator training. The expected operator response is based on the optimal set of actions considering both design basis accidents and accidents outside the design basis. The WOG ERG operator response is not limited to a specific accident progression in order to provide optimal guidance for a wide range of possible accidents.

- To be effective in delaying the switchover to containment sump recirculation, operator actions to stop ECCS or CS pumps must be taken in the first few minutes of an accident. This introduces a significant opportunity for operator errors based on other actions that may be required during this time frame. Any new operator actions to stop ECCS or CS pumps, when modeled in the PRA, are likely to result in increased risk due to operator error.

Once Cold Leg Recirculation is aligned, LOCA-3 directs the operators to implement EPEP-0201. EPEP-0201, Attachment 5 presently contains steps for Reactor Operators to monitor post recirculation ECCS pump performance hourly and report the results to the TSC. The TSC engineers currently compare the data to ECCS pump curves and make recommended corrective actions to mitigate unsatisfactory ECCS pump performance.

As previously discussed, EPEP-0201 will be enhanced to provide additional guidance to the TSC staff to make recommendations to the Reactor Operators based on their evaluations of data and the possibility of sump blockage. Guidance will include consideration for Operator actions that would mitigate the effects of

degraded ECCS pump performance if containment sump blockage is indicated or occurs.

The industry is recommending that changes to the EOPs that take pre-emptive operator actions to shut off one train of ECCS or CS only be considered after Owners Group programs have been completed to evaluate the generic impact of the changes. Salem agrees with the industry recommendation and will wait until the Owners Group has assessed and approved generic changes before any EOP changes are considered. The WOG has committed to evaluate and access actions to delay switchover to containment sump recirculation and provide generic recommendations to utilities by March 31, 2004. After the WOG recommendations are approved and issued, Salem will re-evaluate the need for changes to the EOPs and any supporting analysis or licensing changes that may be required.

For other than Large Break LOCAs guidance to delay depletion of the RWST before switchover to sump recirculation currently exists in S1(2)-EOP-LOCA-2, *Post LOCA Cooldown and Depressurization*. This procedure provides actions to both cooldown and depressurize the RCS to reduce the break flow, thereby reducing the injection flow necessary to maintain RCS subcooling and inventory. The operating SI pumps are sequentially stopped to reduce injection flow, based on pre-established criteria that maintain core cooling, resulting in less outflow from the RWST. For smaller LOCAs, RCS pressure remains greater than the RHR pump discharge pressure and Containment Spray actuation does not occur resulting in a significant reduction of RWST drain down (compared to large LOCAs). It is possible to cooldown and depressurize the RCS to cold shutdown conditions before the RWST is drained to the switchover level. Therefore cold leg recirculation is not required to be established, and sump blockage is not an issue

1.3. Procedure Actions That Delay RWST Inventory Depletion

Based on the philosophy adopted in the current WOG ERGs to take actions based on plant symptoms, it is more appropriate to address actions to "delay RWST inventory depletion" once the loss of recirculation capability is diagnosed. Any generic changes to the WOG ERGs will be evaluated as part of an Owners Group program, and any resulting changes to Salem EOPs will be addressed as stated in section 2 above. Additional guidance will also be provided in EPEP-0201.

The guidance to delay depletion of the RWST following switchover to sump recirculation is currently contained in LOCA-5. This guideline provides actions to reduce the outflow from the RWST to preserve the RWST inventory once it has been determined that a loss of sump recirculation capability exists. LOCA-5 provides guidance for delaying RWST inventory depletion, while ensuring that adequate core cooling flow and containment heat removal is maintained.

1.4. Alternate Sources to Refill the RWST

Guidance to refill the RWST after switchover to sump recirculation is currently contained in the LOCA-5 procedures. The LOCA-5 guidance provides direction to add makeup to RWST referencing procedure S1(2).OP-SO.CVC-0006(Q), *Boron Concentration Control*, if a loss of recirculation capability occurs.

Salem has the capability to inject borated water from the opposite unit RWST using a cross-connect line and opposite unit charging pump. The design is such that the operators can quickly establish borated water flow to the opposite unit. Therefore, the need to fill the affected units RWST as a compensatory measure to maintain an injection source is not necessary, as an alternate borated water source is readily available. This is referenced in procedure S1(2).OP-SO.CVC-0023, *CVCS Cross-Connect Alignment to Unit 2(1).*

1.5. Alternate Sources to Inject into the Reactor Coolant System

As stated above, Salem has the capability to inject borated water from the opposite unit RWST using a cross-connect line and opposite unit charging pump. The design is such that the operators can quickly establish borated water flow to the opposite unit.

Additionally LOCA-5 provides guidance to re-align charging pumps to normal alignment, taking suction from the Volume Control Tank (VCT), if RWST reaches 1.2 ft. Specific guidance is given within the procedure to secure charging pumps, secure charging pump recirculation alignment, establish makeup to the VCT, establish normal charging alignment, start a charging pump and throttle charging to maintain VCT level greater than 4%.

1.6. Foreign Material Exclusion (FME)

Salem FME program procedure SH.MD-AP.ZZ-0052 is used to control foreign materials at all times and is updated to reflect industry and Salem experience.

FME Program for Power Entries

The Salem containment entries at power are controlled via SC.SA-ST.ZZ-0001, *Containment Entries in Modes 1 through 4.* The FME guideline in this procedure emphasizes the need to control debris in containment so it will not migrate to the sump and block ECCS suction flow.

To preclude the accumulation of debris, all materials entering the containment at power are controlled using the FME procedure. All material is logged on the FME log. All personnel are responsible for ensuring that all of their materials are installed, secured or removed upon exiting the containment. In addition, clear plastic is not to be taken into containment building unless efforts are made to

increase it's visibility. In addition, each person entering containment is responsible to fail-safe material that can be easily dropped and not easily retrieved.

The FME containment inspection acceptance criteria requires verification that, "No loose debris (rags, bags, PC's, fire blankets, herculite, etc.) is present in the containment building that could cause restriction of the containment sump and cause restriction of the pump suctions during LOCA conditions."

FME and ECCS Operability

The ECCS sumps are inspected every outage as part of safety injection pump operability per Tech Spec 4.5.3.1 using S1(2).OP-ST.SJ-0011, *Emergency Core Cooling ECCS Subsystems - Containment Sump Modes 5-6.* This procedure requires removal of the outer and inner access panels to perform a visual inspection of the sump. The procedure requires verifying that the RHR suction inlets are not restricted by debris.

Paper tags hung in the Containment are removed following a refueling outage. The exception is for issues that occur on containment equipment during operation. In this case, tags may be hung inside containment to make the appropriate repairs. Tags are controlled and accounted for through a computerized tagging process.

As stated previously, additional training has been scheduled to specifically address Containment Sump blockage concerns identified in NRC Bulletin 2003-01. Licensed Operator training will include an overview of the Containment Sump, effects of debris on the sump screen, transport of debris within containment, instrumentation monitoring to detect the onset of sump blockage and contingency recommendations should sump blockage occur.

Temporary Equipment

Salem station temporary equipment is evaluated per procedure NC.CC-AP.ZZ-0011 (Q), *Transient Loads.* This procedure provides the guidance on use and storage of temporary (transient) loads. The walkdown of Salem Unit 1 and 2 containments for transient loads is conducted prior to entering Mode 2.

1.7. Containment Cleaning

Salem containment cleaning typically consists of

- wiping down accessible areas,
- mopping floors,
- removing tape, tie wraps and loose materials,
- cleaning and vacuuming annulus drains, and

- vacuuming accessible areas at all elevations.

During an outage, this is accomplished under an 'Outage Clean-up' planned activity. This outage activity assures the containment housekeeping standards are met, exiting the outage.

Prior to establishing Containment integrity, an inspection is performed in accordance with procedure S1(2).OP-ST.SJ-0010, *ECCS – Containment Inspection for MODE 4.* This procedure is performed for all accessible areas prior to establishing Containment integrity to assure that no loose debris (rags, trash, clothing, fibrous material, etc.) is present in the containment that could be transported to the containment sump.

A Mode 4 walkdown is performed by an Operations lead multidiscipline team and documented in Operations procedure S1(2).OP-PT.CAN-0001, *Containment Walkdown.* A senior management team typically performs an independent inspection tour of the Containment areas, over and above the proceduralized MODE 4 walkdown, to assure all containment areas are cleaned prior to mode change.

1.8. Ensuring Containment Drainage Paths are Unblocked

Prior to establishing Containment integrity, an inspection is performed in accordance with procedure S1(2).OP-ST.SJ-0010. This procedure assures that no loose debris (rags, trash, clothing, fibrous material, etc.) is present in the containment that could be transported to the containment sump or block drainage paths.

In Mode 4, prior to exceeding RCS pressure of 1000 psig, PSEG initiates a Containment Walkdown to perform visual inspection of all containment elevations in accordance with Salem Operations procedure S1(2).OP-PT.CAN-0001. This activity is a team walkdown. The team composition is members from Operations, Maintenance, Station Planning, Inservice Inspection (ISI), Quality Assurance (QA) and Radiation Protection (RP).

Note: The Containment Walkdown procedure is also performed in Mode 3 (as soon as possible after a Reactor Shutdown or after heating up with normal operating temperature and pressures established) and may be performed in Modes 1-6 as deemed necessary by the Operations Superintendent /Control Room Supervisor.

The Salem Units 1 and 2 Containment Walkdown procedures [S1(2).OP-PT.CAN-0001] are being updated to add emphasis based on the NRC Bulletin 2003-01. This will be completed to support the 2R13 Fall 2003 Refueling Outage and the 1R16 Spring 2004 refueling outage.

During a refueling outage, ECCS operability verification is performed to satisfy Salem Technical Specifications 4.5.2.d and 4.5.3.1 in accordance with procedures

S1(2).OP-ST.SJ-0011. The purpose the visual examination is to verify that the containment sump and its subsystem suction piping are not restricted by debris and that the sump components (trash racks & screens) show no evidence of structural distress or corrosion. The inspection of the containment sump consists of both exterior and interior inspection. The results of the inspections are documented and reviewed for satisfactory inspection. As a part of this ECCS operability verification, the Containment Drain Annulus within and outside of the Bio-Shield area are also inspected to be free of debris with plates (baskets) in place. The drain lines from the annulus trenches to the containment sump will be verified clear of debris during the 2R13 Fall 2003 Refueling Outage and 1R16 Spring 2004 refueling outage.

1.9. Ensuring Sump Screens are Free of Adverse Gaps and Breaches

Salem 1 and 2 sump screens are inspected once each refueling outage by Operations in accordance with surveillance procedures S1(2).OP-ST.SJ-0011(Q). The acceptable inspection criteria for the interior mesh screens are "intact and free of defects".

The Salem 2 sump screen was inspected on September 1999 and corrective actions were initiated that identified adverse gaps in the screen. Noted defects were corrected in the October 2000 refueling outage. Subsequent inspections by Operations (April 30, 2002) indicated satisfactory results.

The last Salem 1 inspection was completed in October 29, 2002. No defects were identified.

For the 2R13 Refueling Outage (Fall, 2003) and 1R16 Refueling Outage (Spring 2004), PSEG will inspect the sump screens with attention to identifying adverse gaps in sump screen, and will evaluate and repair, if required.

2. The following plant specific measure(s) not discussed in the bulletin have been implemented:

Salem Units 1 and 2 have both inner and outer annulus drain trenches. The inner and outer annulus trenches drain to the containment sump, which when it overflows, drains through a screen to the ECCS sump.

Both inner and outer annulus drain trenches provide initial debris filtering before entering the containment sump through a trench basket and a sump screen in front of the ECCS sump. These trenches are routinely vacuumed clean and inspected during the outages.

3. The following measures will not be implemented at the time of the response to the bulletin:

- Enhanced Emergency Preparedness (EP) Training lesson plans need to be prepared, reviewed, and approved for implementation. Then the appropriate plant personnel must be provided the training. The completion of the enhanced EP training will be October 31, 2004.

- Additional training has been scheduled to specifically address Containment Sump blockage concerns identified in NRC Bulletin 2003-01. Licensed Operator training will include an overview of the Containment Sump, effects of debris on the sump mesh, transport of debris within containment, instrumentation monitoring to detect the onset of sump blockage and contingency recommendations should sump blockage occur. This Containment Sump training will be conducted for all Salem Licensed Operators with a completion date of April 30, 2004.

- A number of procedural enhancements are being undertaken to increase awareness and reduce risk of debris blocking sump screens. Procedures and lesson plans will be revised and ready for the upcoming Fall Salem Unit 2 Refueling Outage, and the subsequent Spring Salem Unit 1 Outage.

- Salem will create an order activity PM to inspect and verify containment trench baskets are in place and formally capture inspection information. This will be in place starting with the upcoming outages 2R13 Fall 2003 Refueling Outage and 1R16 Spring 2004 refueling outage. Additionally, the drain lines from the annulus trenches to the containment sump will also be verified clear of debris during the 2R13 Fall 2003 Refueling Outage and 1R16 Spring 2004 refueling outage.

4. The following measures will not be implemented until the next refueling outage:

- Access to the containment sump screens cannot be achieved until a refueling outage. The Salem Unit 2 Sump Screen inspection for gaps or breaches in the sump screens will be scheduled for the Fall 2003 Refueling Outage. The Salem Unit 1 sump screen inspection will occur during the Spring 2004 refueling outage.

- During 2R13 and 1R16 PSEG will wash down and vacuum clean the sump. Preventive Maintenance (PM) work order activities will be created for the upcoming Unit 1 Spring 2004 refueling Outage and Unit 2 Fall 2003 Refueling.

- The drain lines from the annulus trenches to the containment sump will be verified clear of debris during the 2R13 Fall 2003 Refueling Outage and 1R16 Spring 2004 refueling outage.

- Corrective actions are in place to repair damage to paint coatings identified in previous engineering inspection reports and perform additional coating inspections. The actual work is scheduled for the upcoming Fall 2R13 Refueling Outage and the Spring 2004, 1R16 Refueling Outage.

5. The following measures will not be implemented:

The four (4) Bio-shield doors are bolted in place and have a metal screen door. One door is located in each quadrant of the bio-shield area. Pending detailed Salem specific debris transport analysis, PSEG sees no need to make any changes at this time. The bio-shield wire mesh doors prevent unintentional entries to the high radiation areas. These doors can also function to minimize debris transport.

PSEG has no plans to take the interim compensatory measures of shutting down one train of ECCS and/or CSS. This would require changes to the ERGs and EOPs. Formal Owners Group specific, maintenance programs will evaluate the changes to the ERGs and EOPs. The WOG schedule to complete the evaluation of the compensatory measures and recommended EOP changes, if appropriate, is March 31, 2004. Following the completion of WOG activities, PSEG will re-evaluate the need for changes to the EOPs and any supporting analysis or licensing changes, and determine a plant specific implementation schedule to incorporate the recommended guidance.

6. References:

- NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," dated June 9, 2003.

- LA-UR-02-7562, "The Impact of Recovery From Debris-Induced Loss of ECCS Recirculation on PWR Core Damage Frequency," dated February 2003.

- Draft Regulatory Guide 1107 (DG-1107) "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," dated February 2003.

- NUREG/CR-6808, "Knowledge Base for the Effect of Debris on Pressurized Water Reactor Emergency Core Cooling Sump Performance," dated February 2003.

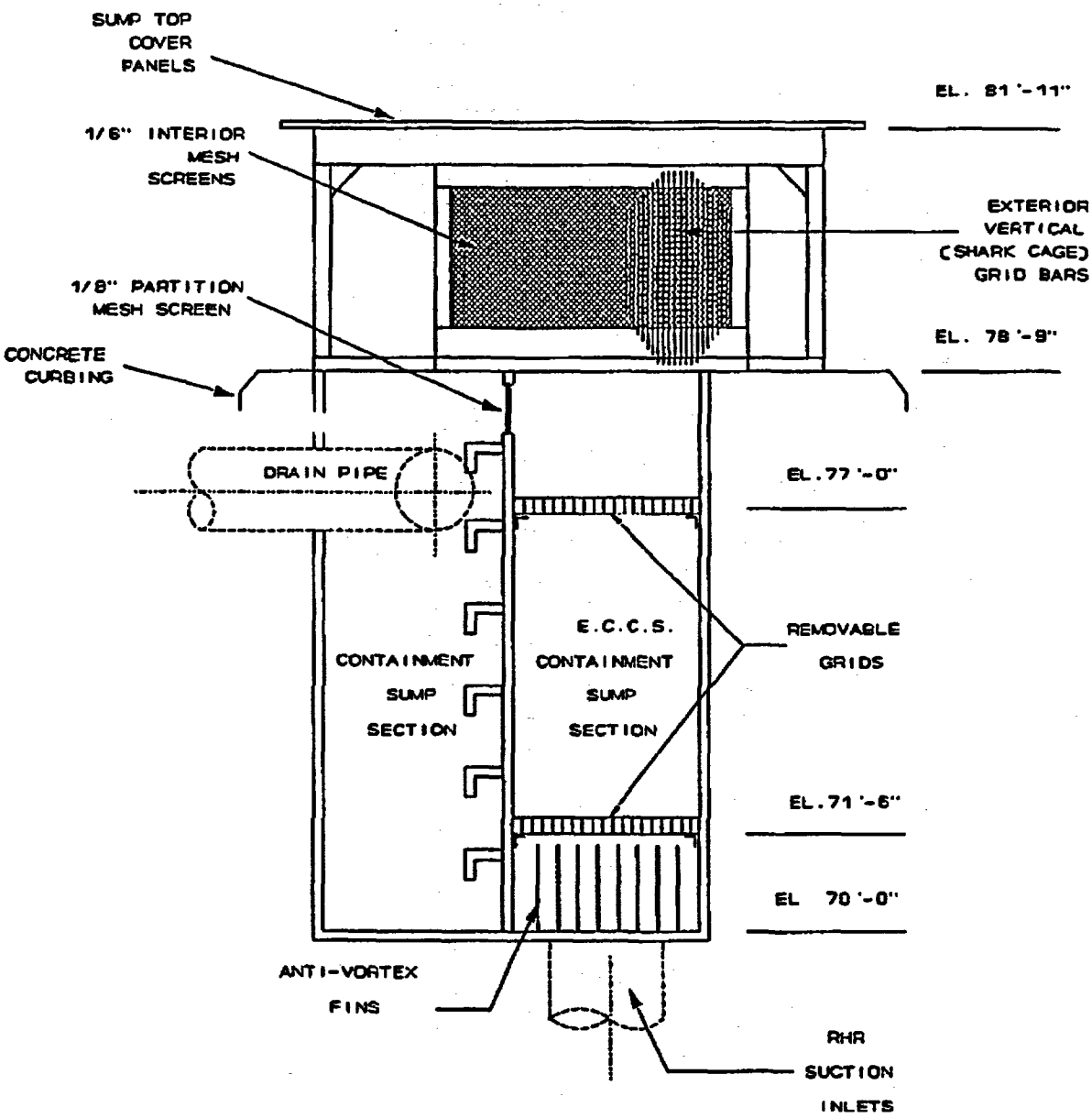
The following commitments are contained in this document:

Section No.	Action	Completion Date
	Additional training has been scheduled to specifically address containment sump blockage concerns identified in NRC Bulletin 2003-01. Licensed Operator training will include an overview of the containment sump, effects of debris on the sump mesh, transport of debris within containment, instrumentation monitoring to detect the onset of sump blockage and contingency recommendations should sump blockage occur. This containment sump training will be conducted for all Salem Licensed Operators.	4/30/04
1.1 3.0	The TSC Integrated Engineering Response procedure EPEP-0201 will be enhanced to provide additional guidance to the TSC staff to mitigate the effects of degraded ECCS pump performance if containment sump blockage is indicated or occurs. The enhancements will include adding steps that direct the TSC engineers to make recommendations to the Operations Superintendent based on their evaluation of the following: • Whether one train of ECCS should be shut down. • Whether one train of Containment Spray should be shut down. • Whether RHR flow should be throttled/reduced. • Whether LOCA-5 should be entered if ECCS flow is degraded. • Whether the Chemical and Volume Control System (CVCS) Positive Displacement Pump (PDP) cross-connection should be used. Refer to procedure S1(2).OP-SO.CVC-0023, *CVCS Cross-Connect Alignment to Unit 2(1).* Training for procedure revisions that are made to EPEP-0201 concerning actions to consider for sump blockage that may be occurring or has occurred will be conducted as follows:	10/15/03 10/31/04

Section No.	Commitment Action	Completion Date
1.1 3.0	• Distribute required reading ("EP Notes") on procedure change(s) to affected TSC Technical Staff by October 15, 2003. • The EPEP-201 changes will be incorporated into the TSC Duties lesson plan by October 15, 2003. • An enhancement to the TSC Duties Qualification Guide that covers monitoring containment sump and what to do, as performance item for initial and annual qualification, will be added by October 15, 2003. • Overviews of Containment Sump issues will be provided at the 2004 TSC Tabletop trainings starting June 2004 and completing by October 2004.	10/15/03 10/31/04
1.8 3.0 4.0	The Salem Units 1 and 2 Containment Walkdown procedures [S1(2).OP-PT.CAN-0001] are being updated to add emphasis based on the NRC Bulletin 2003-01. This will be completed to support the 2R13 Fall 2003 Refueling Outage and the 1R16 Spring 2004 refueling outage. The drain lines from the annulus trenches to the containment sump will be verified clear of debris during the 2R13 Fall 2003 Refueling Outage and 1R16 Spring 2004 refueling outage.	2R13 1R16
3.0	Salem will create an order activity PM to inspect and verify containment trench baskets are in place and formally capture inspection information. This will be in place starting with the upcoming outages 2R13 Fall 2003 Refueling Outage and 1R16 Spring 2004 refueling outage.	2R13 1R16
1.9 4.0	The Salem Unit 2 Sump Screen inspection for gaps or breaches in the sump screens will be scheduled for the Fall 2003 Refueling Outage.	2R13
	The Salem Unit 1 sump screen inspection will occur during the Spring 2004 refueling outage.	1R16

Section No.	Commitment Action	Completion Date
1.9 4.0	During 2R13 and 1R16 PSEG will wash down and vacuum clean the sump. Corrective actions are in place to repair damage to paint coatings identified in previous engineering inspection reports and perform additional coating inspections. The actual work is scheduled for the upcoming Fall 2R13 Refueling Outage and the Spring 2004, 1R16 Refueling Outage.	2R13 1R16

CONTAINMENT SUMP DIAGRAM



CONTAINMENT SUMP INSPECTION