

August 3, 2005

MEMORANDUM TO: David Terao, Section Chief,LPD4-1  
Project Directorate IV  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

FROM: David L. Solorio, Chief */RA/*  
Balance of Plant Section  
Plant Systems Branch  
Division of Systems Safety and Analysis  
Office of Nuclear Reactor Regulation

SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION, UNIT 1  
AND UNIT 2 - CLOSEOUT LETTER FOR BULLETIN 2003-01,  
"POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY  
SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS"

The Plant Systems Branch (SPLB) has reviewed and evaluated the information provided in responses to Bulletin 2003-01 by the licensee for the South Texas Project Electric Generating Station, Unit 1 and Unit 2. SPLB has determined that the licensee's actions have been responsive to and meet the intent of Bulletin 2003-01. Attached to this letter is the proposed close-out letter for the above plant. If you have any questions, please contact Leon Whitney or Alan Wang. Please include Alan Wang and Leon Whitney on the distribution list.

Docket Nos: 50-498, 50-499

Attachment: As stated

CONTACT: Leon Whitney, SPLB/DSSA  
415-3081  
Alan B. Wang, DLPM, PD IV  
415-1445

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NRR-106

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DATE	08 / 03 /05	07 / 21 /05	07 / 25 /05

**OFFICIAL RECORD COPY**

Nuclear Operating Company  
South Texas Project Electric Generating Station  
P.O. Box 289  
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT UNIT 1 AND UNIT 2 - RESPONSE TO NRC BULLETIN 2003-01, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED WATER REACTORS (TAC NOS. MB9615 AND MB9616)

Dear Mr. Jordan:

This letter acknowledges receipt of your response dated August 7, 2003, to Nuclear Regulatory Commission (NRC) Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," dated June 9, 2003. The NRC issued Bulletin 2003-01 to all pressurized-water reactor (PWR) licensees requesting that they provide a response, within 60 days of the date of Bulletin 2003-01, that contains either the information requested in following Option 1 or Option 2 stated in Bulletin 2003-01:

- Option 1: State that the emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the Discussion section, and are in compliance with all existing applicable regulatory requirements.
- Option 2: Describe any interim compensatory measures that have been implemented or that will be implemented to reduce the risk which may be associated with potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance is complete. If any of the interim compensatory measures listed in the Discussion section will not be implemented, provide a justification. Additionally, for any planned interim measures that will not be in place prior to your response to this bulletin, submit an implementation schedule and provide the basis for concluding that their implementation is not practical until a later date.

You provided an Option 2 response.

Bulletin 2003-01 discussed six categories of interim compensatory measures (ICMs):

(1) operator training on indications of and responses to sump clogging; (2) procedural modifications if appropriate, that would delay the switchover to containment sump recirculation (e.g., shutting down redundant pumps that are not necessary to provide required flows to cool

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the containment and reactor core, and operating the CSS intermittently); (3) ensuring that alternative water sources are available to refill the RWST or to otherwise provide inventory to inject into the reactor core and spray into the containment atmosphere; (4) more aggressive containment cleaning and increased foreign material controls; (5) ensuring containment drainage paths are unblocked; (6) ensuring sump screens are free of adverse gaps and breaches.

You stated in your bulletin response of August 7, 2003, that you had implemented the following interim compensatory measures: (1) EOP guidance to delay depletion of the RWST inventory after switchover to sump recirculation - ICM category #3; (2) EOP guidance to delay depletion of the RWST before switchover to sump recirculation for small to medium LOCAs, including actions to cooldown and depressurize the RCS to reduce the break flow (which may also delay or prevent switchover to sump recirculation for smaller LOCAs) - ICM category #2 and ICM category #3; (3) sequential stopping of high head injection pumps based on core cooling requirements to reduce RWST inventory requirements - ICM category #3; (4) nominally maintaining RWST level up to 42,000 gallons above the minimum Technical Specifications limit - ICM category #3; (5) aggressive containment cleaning procedures supervised by Shift Supervisors and containment cleaning briefings conducted by Senior Reactor Operators, applicable to all entries into containment - ICM category #4; (6) procedures to ensure that flanged flowpaths that allow drainage from the reactor cavity to the containment sump are open - ICM category #5; and (7) procedures that require that sump screens be inspected for adverse gaps and breaches during each refueling outage.

You also stated in your response that, as well as existing training on the indications of and responses to sump clogging and loss of ECCS sump recirculation capability, you would be implementing the following interim compensatory measures: (1) licensed operating personnel will be provided information on the issues raised in Bulletin 2003-01, including specific identification of instrumentation available to operators which may provide indications of potential sump blockage - ICM category #1; (2) Initial Licensed Operator training material will be modified to include the indications of sump clogging - ICM category #1; (3) specifics from the Bulletin will be added to the training material for switchover to and loss of emergency sump recirculation - ICM category #1; and (4) classroom training on indications of and responses to sump clogging will be added to the licensed operator training cycle - ICM category #1.

You further stated in your response, including justifications, that you would not be implementing the following interim compensatory measure: (1) procedural modifications, if appropriate, that would delay the switchover to containment pump recirculation - ICM category #2;

In a November 11, 2004 response to an NRC staff request for additional information (RAI) you:

(1) provided a listing of the licensed operator requalification training session discussion of the indications of sump blockage - ICM category #1;

(2) provided a detailed description of the licensed operator requalification simulator training scenario for a design basis loss of cooling accident, including gradual sump blockage leading to loss of at least one train of emergency coolant recirculation, and operator responses to RCS depressurization - ICM category #1;

(3) stated that you had considered Westinghouse Owner's Group (WOG) WCAP-16204, Revision 1, "Evaluation of Potential ERG and EPG Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085)," comparing that document's Sump Blockage Control Room Guideline (SBCRG) and South Texas Project's (STP's) EOPs for a loss of coolant recirculation scenario. STP concluded that changes to the EOPs would not provide any reduction in risk related to sump blockage, nor would it improve sump performance. STP also concluded that the current EOPs accomplish all the major action categories of the SBCRG, obviating the necessity for EOP changes at that time; and

(4) individually discussed your considerations of the Candidate Operator Actions (COAs) contained in WCAP-16204, Revision 1.

With respect to the COAs of WCAP-16204, Revision 1 you stated that for:

- (1) COA A1a, "Secure One Spray Pump," STP was considering moving this existing considered action from after recirculation initiation to prior to recirculation initiation;
- (2) COA A1b, "Secure Two or More Spray Pumps," STP was considering moving this considered step from after recirculation initiation to before recirculation;
- (3) COA A2, "Manually Establish One Train of Containment Sump Recirculation Prior to Automatic Actuation," STP notes that the ERG network does not support these actions, they are not accounted for by time considerations (i.e., potential operator overload may occur), and there was no setpoint in existence for required sump level for operation of an ECCS train or an individual pump;
- (4) COA A-3W, "Terminate One Train of Safety Injection After Recirculation Alignment," STP notes that this step would potentially remove all SI flow from the core should the other train continuing to be relied upon fail, and describes a situation at odds with the symptom-based nature of the ERG network in that it assumes the development of sump clogging;
- (5) COA A4, "Early Termination of One LPSI/RHR Pump Prior to Recirculation Alignment," the same technical justification applied as for COA A-3W above;
- (6) COA A5, "Refill of Refueling Water Storage Tank," the step currently exists in the STP Loss of Emergency Coolant Recirculation EOP. As described below, this response was modified by your letter dated July 13, 2005, to implement RWST refilling following the switchover to sump recirculation - ICM category #3;
- (7) COA A6, "Inject More Than One RWST Volume From a Refilled RWST or By Bypassing the RWST," this action was already incorporated in an existing EOP, but that STP was evaluating additional methods of RWST makeup and evaluating containment flooding concerns associated with this action - ICM category #3;
- (8) COA A7, "Provide More Aggressive Cooldown and Depressurization Following a Small Break LOCA," the step currently exists as step 5 of the STP Loss of Emergency Coolant Recirculation EOP - ICM category #2;

(9) COA A8, "Provide Guidance on Symptoms and Identification of Containment Sump Blockage," STP was already training operators on symptoms of containment sump blockage and evaluating additional instrumentation needed to provide positive indication of sump blockage - ICM category #1;

(10) COA A9, "Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation," STP has developed contingency actions for the existing plant indications configuration, and will revise these contingency actions should COA A8 result in a change to that existing containment sump instrumentation package - ICM category #1; and

(11) COA A10, "Early Termination of One Train of HPSI/High Head Injection Prior to Recirculation Alignment (RAS)," the same technical justification applied as for COA A-3W above.

It is noted that STP has a large dry containment design and therefore COA A11 for ice condenser design containments is not applicable at STP.

In your March 2, 2005, letter providing your 90-day response to Generic Letter 2004-02 you discussed the COAs you have elected to pursue as follows:

(1) for COA A1a, "Secure One Spray Pump," STP continues to evaluate removing a core spray pump from service before recirculation initiation as a final design change, not an interim compensatory measure;

(2) for COA A1b, "Secure Two or More Spray Pumps," STP stated that with verification of containment cooling, the action to remove all CS pumps from service is taken during recirculation by the existing STP EOPs. However, as described below, the staff issued the licensee an RAI concerning this response because it did not address the action recommended by COA A1b, which was to secure all containment spray pumps prior to recirculation (see below) - ICM category #2;

(3) for COA A6, "Inject More Than One RWST Volume From a Refilled RWST or By Bypassing the RWST," STP continues to evaluate additional methods of RWST makeup and is evaluating containment flooding concerns associated with this action;

(4) for COA A8, "Provide Guidance on Symptoms and Identification of Containment Sump Blockage," STP continues to evaluate additional instrumentation needed to provide positive indication of sump blockage as a final sump modification (not simply an interim compensatory measure); and

(5) for COA A9, "Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation," training on the existing configuration continues while COA A8 instrumentation changes are being evaluated. Should that study result in changes to monitored indications, the licensee will revise contingency actions as appropriate - ICM category #1.

In your July 13, 2005, letter responding to the NRC staff's RAI on your 90-day response to Generic Letter 2004-02, you provided additional information concerning four COAs, which is summarized as follows:

(1) for COA A1a, "Secure One Spray Pump," STP has implemented this action. STP is a three-train plant, and, as such, may secure one of the three containment spray pumps and remain in compliance with the single-failure criterion in the current licensing basis. STP stated that the EOPs have been revised to direct securing one containment spray pump prior to recirculation - ICM category #2;

(2) for COA A1b, "Secure Two or More Spray Pumps," STP does not plan to implement this action. With less than two trains of containment spray in operation, STP cannot ensure that doses to control room operators will remain less than the limits of General Design Criterion 19 for the design-basis LOCA;

(3) for COA A5, "Refill of Refueling Water Storage Tank," STP had previously stated that RWST refilling would not occur until sump recirculation is lost. STP has now revised the "Transfer to Cold Leg Recirculation" procedure to direct operators to begin refilling the RWST following the switchover to sump recirculation - ICM category #3; and

(4) for COA A6, "Inject More Than One RWST Volume From a Refilled RWST or By Bypassing the RWST," STP stated that guidance exists for injecting more than a single RWST volume into containment. The actions necessary to support injecting additional RWST inventory into the containment would be coordinated through the Technical Support Center. Although not discussed in your letter dated July 13, 2005, the staff notes that STP's existing "Loss of Emergency Coolant Recirculation" procedure also currently contains steps to bypass the RWST if cold leg recirculation has been lost and there is insufficient volume available in the RWST. In this case, the procedure directs that pumps taking suction on the RWST would be stopped, and blended makeup would be initiated from the volume control tank via the charging pumps - ICM category #3.

The NRC staff has considered your Option 2 response for compensatory measures that were or were to have been implemented to reduce the interim risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions. Based on your response, the NRC staff considers your actions to be responsive to and meet the intent of Bulletin 2003-01. Please retain any records of your actions in response to Bulletin 2003-01, as the NRC staff may conduct subsequent inspection activities regarding this issue.

Should you have any questions, please contact me at 301-415-[xxxx] or the lead PM for this issue, Alan Wang at 301-415-1445.

Sincerely,

[Name], Project Manager, Section [1 or 2]  
Project Directorate [I, II, III, or IV]  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

cc: See next page [Plant Mailing List]

**ADD TO DISTRIBUTION:** AWang, RArchitzel, DSolorio, MKowal, LWhitney, THafera, JLehning