

November 16, 2005

Mr. Charles D. Naslund  
Senior Vice President and Chief Nuclear Officer  
Union Electric Company  
Post Office Box 620  
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1 - CLOSEOUT OF NRC BULLETIN 2003-01,  
"POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP  
RECIRCULATION AT PRESSURIZED-WATER REACTORS"  
(TAC NO. MC9562)

Dear Mr. Naslund:

This letter acknowledges receipt of your response dated August 8, 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. The bulletin provided the two following options for responding:

- 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 the containment and reactor core, and operating the CSS intermittently); (3) ensuring that alternative water sources are available to refill the refueling water storage tank (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; and (6) ensuring sump screens are free of adverse gaps and breaches.

You stated in your bulletin response of August 8, 2003, that you had implemented the following ICMs:

- (1) ensuring that alternate water sources are available to provide inventory to the Reactor Coolant System (RCS) - ICM category #3;
- (2) ensuring that containment drainage paths are unblocked - ICM category #5;
- (3) the establishment of required reading for operations personnel on NRC Bulletin 2003-01 and ICMs taken and planned at Callaway as a result of the Bulletin - ICM category #1; and
- (4) an administrative increase in the minimum RWST level from 93.6 percent to 96.3 percent - ICM category #3.

You also stated in your response that you would be implementing the following ICMs:

- (1) operator training on indications of and response to sump clogging (by December 31, 2003) - ICM category #1;
- (2) additional plant-specific training for outage contractor and plant personnel to increase awareness of sump blockage issues (prior to the spring 2004 refueling outage) - ICM category #1;
- (3) training for Technical Support Center engineering staff of the Emergency Response Organization on the parameters which would indicate that recirculation sump blockage may be developing and what mitigating actions should be considered (by the first quarter of Calendar Year 2004) - ICM category #1;
- (4) more aggressive containment cleaning and increased foreign material controls, including targeting of horizontal surfaces that are not usually accessed (by December 31, 2004) - ICM category #4;
- (5) procedure changes to ensure that containment drainage paths are unblocked and that radiation barrier gates at the four secondary shield wall entrances are not blocked with debris (by October 31, 2003) - ICM category #5; and
- (6) ensuring sump screens are free of adverse gaps and breaches (during any Mode 5 outage prior to the spring 2004 refueling outage, or prior to plant restart following the spring 2004 refueling outage, whichever comes first) - ICM category #6.

You further stated in your response, including justifications, that you would not be implementing the following ICM: procedural modifications that would delay the switchover to containment sump recirculation, stating that potential Westinghouse Owners Group (WOG) Emergency Response Guidelines changes would be evaluated as part of an Owners Group program [in March 2004, a WOG report "WCAP-16204," was issued which provided 11 candidate operator actions (COAs) as ICMs for Bulletin 2003-01].

**In a March 25, 2004, supplemental response to Bulletin 2003-01, you revised your sump screen gap and branch acceptance tolerances to 1/8 inch plus or minus 1/16 inch for the inner sump screen and 1/2 inch plus or minus 1/8 inch for the middle sump screen and deleted essential service water as an alternative injection water source for being impractical from an engineering stand point.**

In a July 9, 2004, response to an NRC request for additional information (RAI) dated April 26, 2004, you discussed a revision to the original Bulletin 2003-01 response stating that the secondary shield wall radiation barrier doors actually would be removed as an ICM until an engineering evaluation can be conducted to determine the impact the doors may have on blocking containment drainage paths - ICM category #5.

In this RAI response, you also stated that the following WOG WCAP-16204 COAs would be fully implemented at Callaway, including completion of all necessary training cycles, contingent on acceptable engineering evaluations and simulator validation:

- (1) COA 1A - operator action to secure one spray pump before recirculation alignment (by April 29, 2005) - ICM category #2;
- (2) COA 5 - refill of RWST after switchover to recirculation (by April 29, 2005) - ICM category #3;
- (3) COA 7 - more aggressive cooldown and depressurization guidance (at the Technical Specification limit) for a small-break loss-of-coolant accident (LOCA)(implemented by existing procedures) - ICM category #2;
- (4) COA 8 - Provide guidance on symptoms and identification of containment sump blockage (by April 20, 2005) - ICM category #1; and
- (5) COA 9 - Develop contingency actions to be taken in response to containment sump blockage (by April 29, 2005) - ICM category #1.

In your RAI response you further stated that the following WOG WCAP-16204 COAs, with justifications, would not be implemented at Callaway:

- (1) COA 1B - "Operator action to secure both spray pumps before recirculation alignment," implementing this COA could potentially cause the exceeding of containment temperature and pressure limits;
- (2) COA 2 - "Manually establish one train of containment sump recirculation prior to automatic recirculation switchover," implementing this COA could potentially cause operator errors due to higher tempo of operator actions;
- (3) COA 3 - "Terminate one train of safety injection after recirculation alignment," implementing this COA could potentially cause increased potential for ECCS flow single failure;

- (4) COA 4 - "Early termination of one residual heat removal pump prior to recirculation alignment," applicable only to CE-designed plants, unlike Callaway which is a Westinghouse-designed plant;
- (5) COA 6 - "Injection of more than one RWST volume or alternate water source bypassing RWST," discussed below;
- (6) COA 10 - "Termination of one train of HPSI [high-pressure safety injection] prior to recirculation," applicable to CE plants only, unlike Callaway which is a Westinghouse designed plant; and
- (7) COA 11 - "Prevent containment spray for small-break LOCAs," applicable only to ice-condenser containments, unlike Callaway which is a large, dry containment.

However, for COA 6, in the September 13, 2005, response, you provided amplifying information to the effect (1) that RCS injection from a refilled RWST is in Step 8 of ECA-1.3, and (2) that direct RCS injection from the volume control tank is in Steps 28 and 34 of ECA-1.3 - ICM category #3.

Your RAI response also provided additional detail on the process for implementing COA operator actions and associated training efforts.

The NRC staff has considered your Option 2 response for compensatory measures that 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 301-415-1307 or the lead PM for this issue, Alan Wang at 301-415-1445.

Sincerely,

**/RA**

Jack Donohew, Senior Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-483

cc: See next page

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