

July 10, 2006

MEMORANDUM TO: Christopher P. Jackson, Chief  
Generic Communications and Power Uprate Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

FROM: Michael L. Scott, Chief **/RA/**  
Safety Issues Resolution Branch  
Division of Safety Systems  
Office of Nuclear Reactor Regulation

SUBJECT: REVISED CLOSEOUT LETTER FOR BULLETIN 2003-01, "POTENTIAL  
IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP  
RECIRCULATION AT PRESSURIZED-WATER REACTORS"

Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," requested licensees to either declare that they were in compliance with 10 CFR 50.46 "Acceptance Criteria for Emergency Core Cooling Systems for Light-water Nuclear Power Reactors," or consider interim compensatory measures to be taken while Generic Safety Issue GSI-191, "Assessment of Debris Accumulation on PWR Sump Performance," was being resolved. Subsequently, Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors," was issued to address final resolution of GSI-191.

In a memorandum dated December 29, 2005 (ML053630329), the Safety Issues Resolution Branch (SSIB) reported that it had reviewed and evaluated the information provided in PWR licensee responses to Bulletin 2003-01. SSIB had determined that the licensee's actions for all 69 PWR reactor plants have been responsive to and meet the intent of Bulletin 2003-01. Enclosed in that letter was a listing of the ADAMS accession numbers for the final NRC-issued close-out letters to most PWR licensees. In the case of five PWRs, the list contained the ADAMS accession numbers for draft close-out letters forwarded by SSIB to the Division of

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Operating Reactor Licensing (DORL) for issue to PWR licensees. DORL has since issued those five closeout letters. The five Bulletin 2003-01 final closeout letter ADAMS accession numbers are:

Diablo Canyon 1/2 - ML053640082  
ANO 1/2 ML05348019912  
Waterford 3 - ML060050477  
Oconee 1/2/3 - ML040830077 and ML060060449  
Point Beach 1/2 - ML 060760116

Subsequent to SSIB's December 29, 2005 letter, the Generic Communications and Power Uprate Branch (PGCB) questioned whether the level of review of the Bulletin responses for certain PWRs with closeout letters preceding the April 2004 issuance of Westinghouse Owner's Group (WOG) WCAP-16204, "Evaluation of Potential ERG and EPB Changes to Address NRC Bulletin 2003-01 recommendations (PA-SEE-0085)," was equivalent to the later Bulletin response reviews. WCAP-16204 contained 11 "candidate operator actions" (COAs - forms of interim compensatory measures) for PWR licensee consideration. The NRC requested PWR licensee to provide the results of their consideration of these COAs. In response to PGCB, SSIB reviewed the six subject licensee responses (for nine units) and the related NRC closeout letters, and interacted with the six PWR licensees as necessary to determine the adequacy of the responses in light of the criteria used to review the later plant responses. The salient results and resolutions for the SSIB review of the affected PWRs follow.

**Davis Besse:** The licensee chose Bulletin Option 1, stating that it met 10 CFR 50.46 at the time the initial Bulletin response was required. No interim compensatory measures for Bulletin 2003-01 were therefore necessary.

The staff's review of documentation submitted by the remaining five PWR (Bulletin Option 2 plant) licensees involved verifying that the licensees had accomplished at least one interim compensatory measure (ICM) in each of the six ICM categories of the Bulletin. This was the standard applied to reviews already conducted for the later PWRs.

**Fort Calhoun:** The licensee's Bulletin response was examined and found to satisfy the later evaluation standard.

**Prairie Island 1/2:** The licensee's Bulletin response was examined and found to satisfy the later evaluation standard.

**Oconee 1/2/3:** The licensee's Bulletin response was examined and found to satisfy the later evaluation standard.

**Crystal River 3:** The licensee was asked whether its plant operators perform aggressive cooldown upon switchover to recirculation for small (and some medium) LOCAs (COA 7 of WCAP-16204, Bulletin ICM Category #2). The licensee confirmed by e-mail (ADAMS Accession No.: ML061880518) that in such situations its plant operators conduct an expedited cooldown within vessel thermal limits. With that information, the licensee's Bulletin response was examined and found to satisfy the later evaluation standard.

**Palisades:** The staff noted that the licensee had committed to WCAP-16204 COA 6, “inject more than one Safety Injection Refueling Water Tank (SIRWT) volume from a refilled/diluted SIRWT or by bypassing the SIRWT,” a Bulletin ICM category #3 interim compensatory measure, yet only committed to line up to refill their SIRWT upon switchover to recirculation. The licensee was asked to consider commencing refill of their SIRWT upon switchover to recirculation (COA 5 of WCAP-16204, Bulletin ICM Category #3). Upon consideration of the relationship between COA 5 and COA 6, the licensee agreed (ADAMS Accession No.: ML060940502) to add a significant quantity of inventory to the SIRWT, 10K-30K gallons, the exact amount to be determined through Equipment Qualification analysis related to the LOCA flood plane. With that new information, the licensee’s Bulletin response was examined and found to satisfy the later evaluation standard.

The final Bulletin 2003-01 closeout letters for PWRs other than at the nine PWR units listed above explicitly addressed 11 COAs. Five of these COAs were adopted by almost no PWR licensees. One COA was not applicable to most licensees (e.g. it dealt with ice condenser plants). Some COAs were redundant to common interim compensatory measures identified in most PWR licensee September 1, 2003 responses to Bulletin 2003-01 (e.g., reducing containment spray flow either before and after switchover to sump recirculation). One COA was a re-statement of a LOCA response approach already commonly existing in PWR procedures (aggressive cooldown for small and some medium LOCAs). Two COAs dealt with formal documentation of sump clogging indications and identification and response criteria, something commonly committed to by licensees in their initial Bulletin 2003-01 responses. These characteristics of the WCAP-16204 COAs are major contributing reasons why the nine PWR units above, reviewed by NRR prior to issuance of the WCAP-16204 COAs, were determined in the March 2006 review to have had a level of review equivalent to those reviewed later against the WCAP-16204 COAs.

PGCB also requested documentation of the closeout rationale for TI-2515/153, “Reactor Containment Sump Blockage (NRC Bulletin 2003-01).” TI-2515/153 had an original expiration date of October 31, 2004, which was later moved to December 31, 2005. TI-2515/153 was intended to verify implementation of licensee commitments under Bulletin 2003-01.

In many cases, resident inspectors, driven by outage schedules, entered containment before final Bulletin 2003-01 commitments to the NRC were finalized. At some sites, the resident inspectors held off completing their TI-2515 inspection reports until Bulletin 2003-01 commitment interactions between the licensee and NRR staff were completed. The expiration of the Bulletin coincided with the late CY 2005 issuance of a number of NRR-issued final Bulletin 2003-01 closeout letters. Based on review of the ROP TI completion database the resident inspectors documented 78% completion of the TI (54 of 69 PWR units).

In response to PGCB’s request, in March, 2006 SSIB conducted a sample audit of 14 inspection reports covering TI-2525/153 for 14 PWRs. The inspection reports reviewed are listed in Enclosure 1. In all 14 cases SSIB found that the resident inspectors had, as directed by NRR, availed themselves of containment entry opportunities even though the NRR Bulletin 2003-01 closeout letter had not been issued. The inspectors had audited the licensee Bulletin 2003-01 interim compensatory measure activities, both inside and outside of containment, against the licensee’s Bulletin 2003-01 responses. For example, if an operator procedural change or plant system modification was described in the licensee’s Bulletin 2003-01 response

letter, the inspectors verified that the change or modification was either in place or being expeditiously made. In all cases the inspectors reviewed the physical status of the containment Emergency Core Cooling System (ECCS) sump (e.g. gaps and breaches), potential drainage path blockage points (e.g. refueling canal drains), licensee containment walkdown procedures, and containment cleanliness (e.g. latent debris).

The sample of 14 inspection reports in the March 2006 SSIB audit found no inspection findings relating to direct failures to implement Bulletin 2003-01 commitments. However, based on licensee letters to the NRC, SSIB is aware of a much larger number of cases in which licensees have, during engineering study of their Bulletin 2003-01 final closeout letter commitments, discovered that these commitments either would not be completed on the original schedule, or should not be implemented for technical, safety or risk reasons. In the absence of any resident inspector input reporting licensee failures to meet their Bulletin 2003-01 commitments, SSIB concludes that licensee compliance with Bulletin 2003-01 commitments has been broadly appropriate.

SSIB has considered, based on the apparent broad compliance with implementation of Bulletin 2003-01 compensatory measures, what action to take regarding TI-2515/153. There are three options available: allow it to remain expired, re-issue it, or issue a new TI with direction to the regions and resident inspectors to inspect against the Bulletin 2003-01 final closeout letters issued by NRR by the end of CY 2005. The main risk reduction benefit of re-issuing TI-2515/153 or issuing a new TI would be to identify interim compensatory measures from NRR's final Bulletin 2003-01 closeout letters to licensees which have not been properly implemented at the reactor sites. An ancillary benefit would be documentation of inspection of implementation of interim compensatory measures addressed in NRR's final Bulletin 2003-01 closeout letters. Potential identification of a few additional cases of improper implementation of Bulletin 2003-01 interim compensatory measures must be weighed against the resources utilized in re-issuing TI-2515/153, and utilized in having resident inspectors at every PWR conduct site inspections following up on commitments in the final Bulletin 2003-01 closeout letters. It must also be noted that such site inspections may not actually be conducted until just before a licensee's GSI-191 permanent configurations are established and the Bulletin 2003-01 interim compensatory measures may be disestablished. Considering the resources and minimal safety benefits involved, it is SSIB's recommendation that TI-2525/153 should remain expired.

Based on the above, SSIB recommends closing out Bulletin 2003-01 and the related TI-2515/153. If you have any questions regarding the analyses supporting SSIB's conclusions, please contact Leon Whitney of SSIB at 301-415-3081.

Enclosure: as stated

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**Inspection Reports Sampled Addressing TI-2515/153**

Arkansas Nuclear One 1/2: IR 2004-003  
Beaver Valley 1/2: 2003-005  
Braidwood 1/2: 2003-008  
Byron 1/2: 2003-007  
Callaway: 2003-005  
Calvert Cliffs 1/2: 2005-002  
Fort Calhoun: 2004-002  
Ginna: 2003-007  
Millstone 2: 2003-010  
Millstone 3: 2004-003  
North Anna : 2004-003  
Palo Verde 1/2/3: 2003-005, 2004-003, 2004-005  
Point Beach 1/2: 2004-003  
Salem 1/2: 2003-009, 2004-003  
Seabrook: 2003-006  
Summer: 2003-005  
Surry 1/2: 2003-005  
Three Mile Island 1: 2003-005  
Turkey Point 3/4: 2003-005  
Watts Bar: 2004-002

ENCLOSURE