

December 20, 2007

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

ULNRC-05465

Ladies and Gentlemen:

**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
SUPPLEMENT TO REQUEST FOR EXTENSION OF CORRECTIVE
ACTIONS COMPLETION DATE FOR NRC GENERIC LETTER 2004-02,
"POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY
RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT
PRESSURIZED-WATER REACTORS"**

- References:
1. AmerenUE Letter ULNRC-05461, dated December 10, 2007.
 2. AmerenUE Letter ULNRC-05408, dated May 1, 2007.
 3. AmerenUE Letter ULNRC-05235, dated December 12, 2005.

By letter dated December 10, 2007 (Reference 1), Union Electric Company (AmerenUE) requested an extension to delay the completion of corrective actions associated with Generic Letter (GL) 2004-02 until June 30, 2008. On December 14, 2007, a teleconference was held between the NRC and AmerenUE to discuss this extension request. As a result of the teleconference, NRC requested additional information to support their review of the extension request. This letter from AmerenUE provides the requested information.

In support of the extension request AmerenUE reports that the following mitigative measures are complete or will be complete by December 31, 2007:

- New containment emergency recirculation sump strainers were installed within each sump during Callaway's spring 2007 refueling outage. The new strainers have nominal 0.045 inch openings and a total surface area of 6623 square feet.

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- Installation of debris barriers in the “A” and “D” loop entrances was also completed during the spring 2007 fueling outage. The debris barriers are designed to reduce the quantity of debris at the containment sumps following a high energy line break (HELB) inside the bioshield. The barriers will diminish the amount of debris that can take the shortest path to the containment sumps, thereby increasing the probability that debris will be held up in low flow areas or deposited on components within the post- HELB flood plain. This debris hold-up will decrease the quantity of debris at the containment sumps, thus minimizing blockage and maximizing NPSH available to the Emergency Core Cooling System (ECCS) and Containment Spray (CS) pumps. Similar barriers are also installed at secondary shield wall penetrations near the sumps and below the post accident water level.
- In August 2003, Callaway increased the minimum Refueling Water Storage Tank (RWST) level to a nominal level of 96.3%. This administratively controlled RWST level assures capacity above the Technical Specification 3.5.4.2 minimum required volume of 394,000 gallons (93.6%), and is also above the current low alarm level of 95.3% (400,674 gallons). This change was performed as a compensatory measure from implementation of NRC Bulletin 2003-01 (Ref. 3).
- The following Westinghouse Owners Group candidate operator actions were implemented at Callaway in April 2005 as part of the overall Emergency Operating Procedure (EOP's) upgrade effort. Additional details are provided in Callaway's response to Bulletin 2003-01 (Ref. 3).
 - a. COA 1A - Operator action to secure one spray pump before recirculation alignment
 - b. COA 5 - Refill of RWST
 - c. COA 8 - Provide Guidance on Symptoms and Identification of CTMT sump blockage
 - d. COA 9 - Develop contingency actions to be taken in response to CTMT sump blockage
- Prior to December 31, 2007, Callaway will implement changes to plant procedures and processes to add programmatic controls for design changes, containment material controls, containment coatings assessment and latent debris assessment.

During the teleconference on December 14, 2007, the NRC acknowledged that strainer head loss testing was scheduled to be performed in January 2008. The NRC asked whether there was a potential for excessive head loss to be identified from the testing. AmerenUE described how it is anticipated that the testing will confirm no excessive head loss. The basis for why excessive head loss is not anticipated (i.e., why margin is anticipated) is detailed below:

- During the March 2006 containment sump strainer testing, the amount of Nukon added to the test flume was based on the zone of influence (ZOI) from NEI 04-07 (i.e. 17D ZOI). After performance of the March 2006 strainer testing, Callaway and Wolf Creek performed joint testing of stainless steel jacketed Nukon insulation. As a result of this testing, the ZOI for Nukon insulation has been reduced from that provided in NEI 04-07. As a result of this reduced ZOI, Callaway will have less fibrous insulation available for generation and subsequent transport.
- During the March 2006 containment sump strainer testing, the most challenging RCS break, with regard to net positive suction head (NPSH), was a break involving Min-K insulation. Callaway and Wolf Creek have performed joint testing of stainless steel encapsulated Min-K insulation. From this testing it was shown that the Min-K insulation will remain encapsulated and not become a source of post-accident debris. Therefore, Callaway will not have any Min-K insulation available for generation and subsequent transport. It should be noted that the head loss for all other test cases for the March 2006 containment sump strainer testing, which did not involve Min-K, was on a magnitude of order lower.
- The March 2006 containment sump strainer testing debris quantities conservatively added all debris directly on top of the containment sump strainer test module. The strainer testing planned for January 2008 will take advantage of a testing flume which will replicate the representative velocities approaching the containment sump strainers. The representative velocities were determined using a computational fluid dynamics (CFD) model near the containment sumps. The use of this testing flume will represent the velocities approaching the containment sump strainers and is anticipated to result in less debris at the containment sump strainers due to debris settlement.
- The increase of the replacement containment sump strainers and incorporation of uniform flow control (i.e. uniform flow control through all sections of the modules) has resulted in a very low CTMT sump

strainer velocity (less than 0.01 feet per second at the face of the strainer). During the sump strainer testing in March 2006, it was noted that this low velocity at the face of the sump strainers allowed a majority of debris, which was conservatively poured directly on or near the strainer, to fall into the sump pit and not accumulate on the sump strainer face. The reduction in the velocity at the face of the strainer will reduce the potential collection and compression of transported debris, thus minimizing head loss through the strainer and NPSH margin loss. This beneficial phenomenon was also noted in a March 2005 NRC trip report to Alden Laboratories for the PCI SFS system. (Ref. ADAMS ML052060337, ML052060043)

Based on the discussion above, no excessive head loss is anticipated for the containment sump strainer testing currently planned for January 2008.

With regard to actions identified as commitments for GL 2004-02, AmerenUE is providing via this letter status information for those commitments. This information was requested in the December 12, 2007 teleconference, and is provided in the Enclosure to this letter. This letter does not change any of the existing commitments nor add any new commitments. AmerenUE does not anticipate implementation of any additional modifications to the Callaway Plant in response to GL 2004-02 based on the data collected and analysis performed to date.

Please contact Tom Elwood, Supervising Engineer, Regulatory Affairs and Licensing at 573-676-6479 for any questions you may have regarding this issue.

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

Sincerely,

Executed on: 12-20-07



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ULNRC-05465
December 21, 2007

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LIST OF COMMITMENTS

The following table provides an update/status for each of the open actions committed to by AmerenUE in Reference 1 of the cover letter. The numbering in this table is maintained consistent with Reference 1. Any other statements in this document are provided for information purposes and are not considered commitments. Please direct questions regarding these commitments to Tom Elwood, Supervising Engineer, Regulatory Affairs and Licensing at 573-676-6479.

COMMITMENT	Status	Due Date/Event
2. The following corrective action activities will be completed:		
b. Downstream effects evaluation.	Initial downstream evaluations have been performed; however, refinements are being pursued using test data and input from PWROG/NRC discussions concerning nuclear fuel.	June 30, 2008
c. Upstream effects evaluation.	Upstream evaluations have been performed and will be included in the Westinghouse team analysis summary report associated with item 4.f. of this table.	June 30, 2008
3. Submit an update to information contained in Callaway's response to Generic Letter 2004-02 Requested Information Item 2	The analyses are proceeding and refinements are being pursued. The update of information contained in section 2(c) of Callaway's September 1, 2005 (ULNRC-05194) response to Generic Letter 2004-02 will be provided after completion of item 4.f. of this table.	June 30, 2008

4. The following evaluations and testing will be completed:		
b. NEI 04-07 debris generation calculation.	The debris generation calculation has been performed and will be included in the Westinghouse team analysis summary report associated with item 4.f. of this table. A revision to the current debris generation calculation is being conducted to utilize refinements based on testing or additional analysis.	June 30, 2008
c. NEI 04-07 debris transport calculation.	The debris transport calculation has been performed and will be included in the Westinghouse team analysis summary report associated with item 4.f. of this table. A revision to the current debris transport calculation is being conducted to utilize several refinements based on testing or additional analysis.	June 30, 2008

<p>d. Evaluate the impact of chemical effects on containment emergency sump strainer head loss during design basis accident conditions</p>	<p>WCAP 16530-NP guidance was used as part of the strainer performance testing performed during the week of March 13, 2006. WCAP 16530-NP and the associated developing NRC Safety Evaluation will be utilized as guidance for chemical precipitant debris used during the strainer testing currently scheduled for January 2008.</p>	<p>June 30, 2008</p>
<p>e. Confirmation that the replacement sump strainer design provides for available NPSH to be in excess of required NPSH.</p>	<p>The current strainer performance test report is based on the March 13, 2006 strainer testing and has been used in the determination of adequate NPSH. This item will be reviewed and revised, as necessary, after receipt of testing reports from the containment sump strainer testing currently planned for January 2008.</p>	<p>June 30, 2008</p>
<p>f. Completion of the final site acceptance review of the Westinghouse team analysis summary report.</p>	<p>Several of the items contained in the final report have been completed but the final report will not be issued until all items are completed.</p>	<p>June 30, 2008</p>
<p>g. Replacement sump screen head loss testing</p>	<p>Strainer performance testing was performed during the week of March 13, 2006. This item will be reviewed and revised, as necessary, after receipt of testing reports from the containment sump strainer testing currently planned for January 2008.</p>	<p>June 30, 2008</p>

<p>5. The following item will be completed::</p>		
<p>c Evaluation and implementation of potential modification to the safety injection system to address downstream effects.</p>	<p>Implementation of potential modification to the safety injection system is dependant on the refinements mentioned in item 2.b. of this table. Based on the evaluations completed to date, the downstream effects evaluations have been performed and conclude that there are no modifications necessary for the Safety Injection system. However, as GSI-191 evaluations are finalized, this conclusion will be re-evaluated to determine if additional efforts are required.</p>	<p>June 30, 2008</p>
<p>6. Callaway will complete removal of containment spray system (CSS) pump cyclone separators, if required based on the results of the downstream effects evaluation.</p>	<p>Removal of containment spray system (CSS) pump cyclone separators is dependent on the results of the downstream effects evaluation identified as item 2.b of this table.</p>	<p>June 30, 2008</p>
<p>7. The following programs and controls will be implemented at Callaway to control debris sources.</p>		
<p>a. Changes to design change process procedures to ensure that necessary engineering evaluations will be performed for plant design that either directly or indirectly affects containment, ECCS, or CSS.</p>	<p>Complete</p>	<p>Complete</p>
<p>b. Changes to containment entry and material control procedure requirements for control of materials during work activities conducted in the containment.</p>	<p>These changes will be implemented prior to December 31, 2007.</p>	<p>December 31, 2007</p>
<p>c. Changes to programs and procedures that have the potential to add tags and labels inside containment.</p>	<p>These changes will be implemented prior to December 31, 2007.</p>	<p>December 31, 2007</p>

d. Implementation of a containment coatings assessment program	Complete	Complete
e. Implementation of a containment latent debris assessment program	These changes will be implemented prior to December 31, 2007.	December 31, 2007
f. Implementation of changes to the inspection processes for the installed sump strainers	Complete	Complete
8. A final response will be submitted to the NRC to provide a final status of actions requested by Generic Letter 2004-02.		June 30, 2008