



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 17, 2009

LICENSEES: Union Electric Company  
Wolf Creek Nuclear Operating Corporation

FACILITIES: Callaway Plant, Unit 1  
Wolf Creek Generating Station

SUBJECT: SUMMARY OF NOVEMBER 20, 2009, CATEGORY 1 MEETING WITH UNION ELECTRIC COMPANY AND WOLF CREEK NUCLEAR OPERATING CORPORATION – CONTINUATION OF DISCUSSION OF REQUEST FOR ADDITIONAL INFORMATION FOR GENERIC LETTER 2004-02, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS" (TAC NOS. MC4671 AND MC4731)

On November 20, 2009, a public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) staff, and representatives of Union Electric Company and Wolf Creek Nuclear Operating Corporation (the licensees), at NRC Headquarters, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss the licensees' proposed responses to requests for additional information (RAIs) for Callaway Plant, Unit 1 (Callaway), dated August 27, 2009, and Wolf Creek Generating Station (Wolf Creek), dated July 31, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML092220572 and ML092030628, respectively). Many of questions in the RAIs were resolved during previous communications. This meeting addressed the remaining questions in the RAIs which could not be resolved in previous communications.

A list of meeting attendees is enclosed (Enclosure 1).

At this meeting, the licensees summarized the information for their proposed responses to questions that were not resolved in previous communications with both Callaway and Wolf Creek licensees. The licensees' presentation viewgraphs are available at ADAMS Accession No. ML093380148.

Based on meeting discussions, the NRC staff and the licensees for Callaway and Wolf Creek facilities concluded the following.

- The status of the remaining NRC RAI questions numbered 3-13 and 16, 14, 26, 24, 29, 30, 21, 35, 17, 28, 33, 32, 27, 22, 37, and 39, for Wolf Creek, and the RAI question number 2 for Callaway only is as summarized below. As noted previously, RAI numbers refer to the Wolf Creek RAI questions contained in ADAMS Accession No. ML092030628, which the Callaway licensee also agreed to address for Callaway facility. These RAI questions are described in the licensees' presentation viewgraphs and are summarized here in Enclosure 2 for reference.

In addition to the above listed RAI questions, the licensee also discussed RAI question No. 25 (which relates to addressing the licensees' basis for assumption that large pieces of fiberglass debris cannot float sufficient distances to reach and deposit on strainers), and RAI question No. 45 (which addresses the justification for using chips larger than those determined in Keeler and Long Report, and requests an industry testing reference used by the licensees).

- The RAI questions not listed below were fully discussed previously in the meeting summary dated September 28, 2009, for the August 27, 2009, public meeting (ADAMS Accession No. ML092460714) and other teleconferences.

Status of Remaining RAIs:

RAIs 3-13	These RAIs are part of the ongoing issue resolution discussions between the NRC and the Pressurized Water Reactor Owners Group. Detailed discussions were not held during this meeting.
RAI 14	The NRC staff considered the licensees' planned plant-specific responses acceptable.
RAI 16	The licensees were not prepared to address the 60/40 size distribution issue. The Licensee expects to address this in a future interaction.
RAIs 17, 28, 33, and 35	The NRC staff requested a trace from head loss testing to validate the connection of head loss to arrival of fine and small debris. The NRC staff also requested an estimate of how much debris went into the flume in the most recent test.
RAI 21	Resolution of this RAI is tied to results of Alion erosion testing. This will be discussed at a future interaction.
RAI 22	The NRC staff will further review and consider the licensees' response to this RAI and will provide feedback to the licensees.
RAI 24	The NRC staff considered the licensees' response to this RAI reasonable. The licensee is expected to ensure its written response addresses all debris types noted in the RAIs.
RAI 25	The NRC staff stated that it had no further concerns on this subject.
RAI 26	The NRC staff considered the licensees' approach reasonable and this issue is not of major concern.
RAI 27	The NRC staff asked the licensees to show that the test flume velocity profile is conservative as compared to expected plant post loss-of-coolant accident conditions (i.e., to show what use of weighted average flow is conservative).
RAI 29	The NRC staff suggested that the licensees should show the extent to which interferences and/or obstacles would divert falling water and to quantify how much water would be expected to fall in this area of interferences and/or obstacles.
RAI 30	The NRC staff considered the licensees' proposed response to be acceptable. The NRC staff suggested that the licensees describe the conservatism in coating debris calculations and conservatism in the referenced NUREG conditions as compared to expected plant conditions.

RAI 32	The licensees tentatively plan to make an argument based on observed settling that the single-train assumption evaluated is conservative for strainer performance.
RAIs 37 and 39	The NRC staff considered the licensees' proposed responses to be acceptable.
RAI 45	The NRC staff expects to provide feedback on this item but expressed the view that the licensees response is likely to be acceptable.
Callaway RAI 2	The NRC staff considered the proposed response acceptable, but suggested that the licensees clearly state in its submittals that the main steam line break analysis does not credit containment spray, as indicated verbally by the Callaway licensee at the meeting.

Following the discussion of the above RAIs, the NRC staff and the licensees agreed that additional phone calls and/or a meeting(s) are needed to resolve the remaining issues.

The NRC staff and the licensee expect to hold phone calls to address those issues. The phone calls and meetings will be noticed to the public and, if possible, will be scheduled for a January 2010 timeframe.

There were no questions or comments from members of the public. Also, no Public Meeting Feedback forms were received for this meeting.

If there are any questions please direct them to me at (301) 415-2476 or email [mohan.thadani@nrc.gov](mailto:mohan.thadani@nrc.gov).

Sincerely,



Mohan C. Thadani, Senior Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-482 and 50-483

Enclosure:  
List of Attendees

cc w/encl: Distribution via Listserv (Callaway and Wolf Creek)

LIST OF ATTENDEES

U.S. NUCLEAR REGULATORY COMMISSION

MEETING WITH UNION ELECTRIC COMPANY (UEC) AND

WOLF CREEK NUCLEAR OPERATING CORPORATION (WCNOC)

November 20, 2009

<b>Name</b>	<b>Affiliation</b>
Maveirs Dingier	WCNOC
Ron Holloway	WCNOC
Brian Holderness	AmerenEU – Callaway
Matt Brandes	AmerenEU – Callaway
Randy Hall	NRC/NRR/DORL
Tim Sande	Wolf Creek Contractor – Alion
Shannon Abel	AmerenUE – Callaway
Chris Kudia	PCI
Terry Garrett	WCNOC
Stuart Cain	Aiden
Ken Peterson	STARS
Ralph Architzel	NRC
John Lehning	NRC
Steve Smith	NRC
Mohan Thadani	NRC
Michael Scott	NRC

Brief Descriptions of the RAI Questions  
Discussed at the November 20, 2009 Meeting

### Brief Descriptions of the RAI Questions Discussed at the November 20, 2009 Meeting

The following Wolf Creek RAI questions, applicable to Wolf Creek and Callaway licensees, were discussed:

- RAIs 3-13:  
and 16: These items relate to generic discussions regarding credit for reduction in zone of influence. The licensees were requested to provide contingency plans for the eventuality if the NRC staff does not accept the reductions.
- RAI 14: This question was not applicable to Wolf Creek. Callaway is presently evaluating the acceptability of the thermal wrap system and discussed methods and results at the public meeting.
- RAI 17: In advance of the public meeting, the licensees provided a copy of the video for the Alden Test, showing separation of the fibrous debris in representative and conservative manner, for the NRC staff's review. See response to question 33.
- RAI 21: The licensees indicated that small fines of fiber were assumed to transport 100 percent in the active recirculation pool. The licensees had previously discussed this matter in detail during the August 27, 2009 public meeting.
- RAI 22: The licensees provided in advance of the public meeting a video for the Alden Test performed on August 18, 2009, which may resolve the NRC staff's concerns. The NRC staff agreed to review the video.
- RAI 24: NRC staff requested the licensees to provide detailed information in the area of the tortuous path to sumps during the future public meeting. The licensees were also requested to explain curb lift velocities for debris carryover to the sumps.
- RAI 26:  
plan: The NRC staff stated it was not apparent that soaking of the debris prior to insertion to remove any air entrained on the surface of the debris is conservative. The licensees' to discuss this matter at the proposed public meeting, that it is prototypical and that the amounts of debris involved would be small.
- RAI 27: The licensees agreed to provide and discuss a figure showing the flow stream lines during the proposed public meeting.
- RAI 28: The licensees discussed conservatisms in the debris preparation methodology used by its contractor, PCI. The NRC staff expressed concern with the justifications and requested that the licensees discuss this matter in more detail during the planned public meeting. The staff noted that the NRC was not satisfied with the rationale provided and the sub-bullets on debris preparation conservatisms in the RAI and that a rigorous justification would be needed (see RAI question 33).
- RAI 29: The licensees' plan to discuss the impact of overhead grating drainage sources near the sump strainers.
- RAI 30: The licensees' plan to describe the correlation of NUREG/CR-6916, "Hydraulic Transport of Coating Debris," and its application to Callaway and Wolf Creek strainer analysis as

described in the information provided during the meeting. The licensees may show the impact of the assumption is small.

- RAI 32: The licensees' plan to address whether the two-train case leads to more fines and is expected to provide a basis for conclusion that for the single-train case, increased debris loading would be more significant than reduced sump approach velocity.
- RAI 33: Since the concerns stated by this RAI question is being addressed by responses to other RAI questions, the NRC staff requested the licensees to provide cross references to other RAI questions where the concerns are addressed (RAI questions 17 and 28).
- RAI 35: The licensees stated that they misunderstood the question and will re-evaluate and provide response at the next public meeting.
- RAI 37: As stated under RAI 3 above, the NRC staff will provide feed back to the licensees based on the additional information provided during the meeting. This RAI will also be discussed during the planned public meeting.
- RAI 39: The NRC staff suggested that the licensees use a curve that bounds the head loss data. The licensees' plan to re-evaluate and provide response during the future public meeting.

The Callaway licensee will discuss the status of the following RAI question that did not clearly cross reference to Wolf Creek RAI:

- RAI 2 The licensee will discussed the licensing and physical arguments regarding its approach to main steam line break accident to justify that large-break loss-of-coolant-accident is bounding from a debris generation standpoint.

RAI 32	The licensees tentatively plan to make an argument based on observed settling that the single-train assumption evaluated is conservative for strainer performance.
RAIs 37 and 39	The NRC staff considered the licensees' proposed responses to be acceptable.
RAI 45	The NRC staff expects to provide feedback on this item but expressed the view that the licensees response is likely to be acceptable.
Callaway RAI 2	The NRC staff considered the proposed response acceptable, but suggested that the licensees clearly state in its submittals that the main steam line break analysis does not credit containment spray, as indicated verbally by the Callaway licensee at the meeting.

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Sincerely,

/RA/

Mohan C. Thadani, Senior Project Manager  
 Plant Licensing Branch IV  
 Division of Operating Reactor Licensing  
 Office of Nuclear Reactor Regulation

Docket Nos. 50-482 and 50-483

Enclosure:  
 List of Attendees

cc w/encl: Distribution via Listserv (Callaway and Wolf Creek)

**DISTRIBUTION:**

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**ADAMS Accession Nos. Meeting Notice ML092930015, Meeting Summary ML093380566; Licensee Slides ML093380148**

OFFICE	NRR/LPL4/PM	NRR/LPL4/PM	NRR/LPL4/LA	DSS/SSIB/BC	NRR/LPL4/BC	NRR/LPL4/PM
NAME	MThadani	BSingal	JBurkhardt	MScott	MMarkley	MThadani
DATE	12/09/2009	12/09/2009	12/7/09	12/14/2009	12/17/09	12/17/09