



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

December 23, 2011

LICENSEE: STP Nuclear Operating Company  
FACILITY: South Texas Project, Units 1 and 2  
SUBJECT: SUMMARY OF DECEMBER 1, 2011, PRE-LICENSING PUBLIC MEETING WITH STP NUCLEAR OPERATING COMPANY HELD VIA CONFERENCE CALL TO DISCUSS THE PROPOSED RISK-INFORMED APPROACH TO THE RESOLUTION OF GSI-191, "ASSESSMENT OF DEBRIS ACCUMULATION ON PWR SUMP PERFORMANCE" (TAC NOS. ME5358 AND ME5359)

On December 1, 2011, a public meeting was held via conference call between the U.S. Nuclear Regulatory Commission (NRC), and representatives of STP Nuclear Operating Company (STPNOC, the licensee), at NRC Headquarters, Rockville, Maryland. The meeting notice and agenda, dated November 1, 2011, is located in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML113210411. The purpose of the meeting was to discuss the proposed risk-informed approach to the resolution of Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR [Pressurized-Water Reactor] Sump Performance." South Texas Project (STP) is the lead plant and STPNOC plans to submit a license amendment request in mid-2012. The licensee previously provided an overview of its proposed approach during the public meetings held on June 2, July 6, July 26, August 22, October 3, November 1, and November 2, 2011<sup>1</sup>. The purpose of this conference call was to discuss the results of initial quantification for in-vessel effects as part of its assessment as requested by Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004 (ADAMS Accession No. ML042360586), and uncertainties analysis of the loss-of-coolant accident (LOCA) event frequencies. STPNOC also planned to have a follow-up discussion on the topics of chemical effects testing and LOCA initiating event frequencies and uncertainties.

STPNOC indicated during the conference call it was unable to complete its analysis for initial quantification for in-vessel effects and will have to request another public meeting in the future. The entire discussion was focused on follow-up discussion for chemical effects testing.

A list of meeting attendees is provided in the Enclosure to this meeting summary.

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<sup>1</sup> Summaries of the meetings held on June 2, July 7, July 26, August 22, October 3, November 1, and November 2, 2011, are available in ADAMS Accession Nos. ML111640160, ML111950094, ML112130165, ML112411419, ML112840114, ML113120129, and ML113180196, respectively.

### **Meeting Summary**

The licensee provided a copy of the following document prior to the meeting:

- Chemical Effects Implications of WCAP-16530-NP for South Texas Project, dated December 1, 2011 (ADAMS Accession No. ML113350563)

The following topics were discussed during the meeting:

- Conservatism in Chemical Effects – WCAP-16530-NP
- Reduction in Conservatism
- Objectives of New Chemical Effects Testing and Preliminary Testing Ideas

### **Results of Discussions**

- The NRC staff agreed that the WCAP-16530-NP base method approach for calculating the amount of precipitate may over-predict the amount of chemical precipitate for STP.
- Most of the chemical effects slides presented by the licensee during the phone call focused on aluminum precipitates. While this is important, since aluminum is a key contributor to chemical precipitation in many plants, the NRC staff expressed the view that other precipitates such as calcium phosphates or other precipitates not considered as part of the WCAP-16530 methodology may be more relevant to the STP plant-specific environment. The NRC staff noted that some calcium-based precipitates can form at high temperatures prior to the time Emergency Core Cooling System (ECCS) flow to the core is switched to hot-leg injection.
- The NRC staff indicated that Slide 8 of the presentation implies that the WCAP-16530 method for calculating the release of aluminum is obtained by fitting the linear part of the aluminum release from the integrated chemical effects testing (ICET) tests. The WCAP release model was developed from a variety of tests, including the 30-day aluminum release from the ICET tests. The NRC staff expressed the view that, in some cases, the WCAP method may over-predict the measured 30-day dissolved aluminum and in other cases it may under-predict the 30-day aluminum release. The NRC staff also noted that a number of licensees did not apply the full WCAP precipitate load to the net positive suction head margin at the time of ECCS switch-over to recirculation mode but obtained credit for delayed precipitation of aluminum precipitates.
- The NRC staff expressed the view that although the contribution from the aluminum coupons sprayed during the ICET tests was minimal, the coupons above the water line in the ICET tank completely dried after the 4-hour spray duration and this may not be representative of the post-LOCA conditions at STP.

- The NRC staff indicated that, due to its previously stated concerns (ADAMS Accession No. ML082560233), chemical effects data from previous testing at Alion Science and Technology Hydraulics Laboratory in VUEZ (Slovakia) should not be used as part of the technical basis for STP evaluation.
- Since the licensee is considering autoclave testing as one of the potential methods for assessing chemical effects, the NRC staff suggested STPNOC may want to review the information from another licensee that performed autoclave testing with hot filtering as a method to check for chemical precipitate timing. The NRC staff agreed to provide the licensee with an ADAMS Accession Number reference that summarizes the earlier work.
- There was considerable discussion of the licensee's intent to use a pre-formed fiber bed as part of a screening test to evaluate whether chemical precipitates form in the STP plant-specific environment. The NRC staff expressed the view that a thick (e.g., 2-3 inch bed) pre-placed bed, cut from a fiber blanket, would not be as sensitive to the presence of chemical precipitate as a more compact bed formed by flow, as appears on a sump strainer or in the core. The licensee discussed the need for a well-defined bed to obtain consistent results in the chemical effects testing, which the staff supports. However, because the proposed bed has so much open area compared to a more prototypical bed, the deposition of chemical precipitate onto the bed may have no measurable effect on head loss across the bed.

The NRC staff considers this to be a critical aspect of the testing (acceptability for chemical effects) and STPNOC agreed to further discussions in this area.

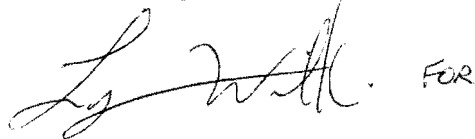
- Due to time constraints, the licensee and NRC staff agreed to hold a separate phone call to discuss which of the expert panel phenomena identification and ranking table (PIRT) items will need to be revisited by STPNOC. The NRC staff had previously provided STPNOC with a list of PIRT items that had been dispositioned based on the conservatism of the WCAP-16530 approach (ADAMS Accession No. ML113330116).
- Regarding the overall risk evaluation, the NRC staff reiterated its concern that the first-cut risk numbers would not include chemical effects. The licensee stated that it is confident there would be no significant chemical effects at STP and that the contribution of chemical effects would not be addressed until 2012. The NRC staff expressed the view that chemical effects are a significant contributor to head loss across a debris bed, especially for in-vessel effects, and therefore, contribute significantly to uncertainty in the risk analysis that must be addressed via sensitivity studies or other means in accordance with NRC Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."

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No Public Meeting Feedback Forms were received for this meeting.

Please direct any inquiries to me at (301) 415-3016, or [balwant.singal@nrc.gov](mailto:balwant.singal@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "B. Singal" followed by "FOR" in a smaller, less legible script.

Balwant K. Singal, Senior Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:  
List of Attendees

cc w/encl: Distribution via Listserv

LIST OF ATTENDEES  
FOR MEETING WITH STP NUCLEAR OPERATING COMPANY  
REGARDING RISK-INFORMED APPROACH TO RESOLUTION OF GSI-191 ISSUE  
SOUTH TEXAS PROJECT, UNITS 1 AND 2  
OCTOBER 3, 2011

<b>NAME</b>	<b>TITLE</b>	<b>ORGANIZATION</b>
Paul Jamie*	Licensing	STP Nuclear Operating Company (STPNOC)
Steve Blossom*	Project Manager, Special Projects	STPNOC
Ernie Kee*	Risk Management	STPNOC
Carl Grantom	Manager Risk Project	STPNOC
Wayne Harrison	Licensing Manager	STPNOC
William Schultz	-	STPNOC
Tim Sande*	Principal Engineer	Alion Science and Technology**
Kerry Howe	-	University of Mexico**
Gil Zigler	-	Alion Science and Technology**
Bruce Letellier	-	Las Alamos National Laboratory**
Mike Golay	-	Massachusetts Institute of Technology**
Phillip Grissom*	Principal Engineer	Southern Nuclear Company
Mark Richter	Senior Project Manager	Nuclear Energy Institute
Andre Drake	-	Constellation Energy
Jeff Weyhmler	-	Palisades
William Oberkamp	Consultant	
Joshua Kaizer	-	Nuclear Regulatory Commission (NRC)
John Tsao	Materials Engineer	NRC
Michael Snodderly	Senior Reliability and Risk Engineer	NRC
Balwant K. Singal	Senior Project Manager	NRC
Robert Tregoning*	Senior Technical Advisor for Materials Engineering Issues	NRC
Erv Geiger	Senior Engineer	NRC
Stewart Bailey	Branch Chief	NRC
Steve Smith	Reactor Systems Engineer	NRC
Matt Yoder	Senior Chemical Engineer	NRC
Paul Klein	Senior Materials Engineer	NRC
J. Lehning	Reactor Engineer	NRC

\* Participated via phone

\*\* Represented STPNOC

Enclosure

No Public Meeting Feedback Forms were received for this meeting.

Please direct any inquiries to me at (301) 415-3016, or [balwant.singal@nrc.gov](mailto:balwant.singal@nrc.gov).

Sincerely,

/RA by Lynnea Wilkins for/

Balwant K. Singal, Senior Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:  
List of Attendees

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RidsRgn4MailCenter Resource	

**ADAMS Accession No. ML113430087**

**\*Via E-mail**

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	NRR/DSS/SSIB/BC	NRR/DRA/APLA
NAME	BSingal (JRHall for)	JBurkhardt	SBailey*	MSnodderly*
DATE	12/15/11	12/9/11	12/13/11	12/12/11
OFFICE	NRR/DE/ESGB/BC (A)	NRR/LPL4/BC	NRR/LPL4/PM	
NAME	VCusumano*	MMarkley	BSingal (LWilkins for)	
DATE	12/15/11	12/22/11	12/23/11	

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