

September 25, 2007

MEMORANDUM TO: Michael L. Scott, Chief
Safety Issues Resolution Branch
Division of Safety Systems
Office of Nuclear Reactor Regulation

FROM: James O'Driscoll, Project Manager */RA/*
Generic Communications and Power Uprate Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF AUGUST 23 AND 24, 2007, PUBLIC MEETING WITH
THE NUCLEAR ENERGY INSTITUTE (NEI), PRESSURIZED WATER
REACTOR OWNERS GROUP (PWROG), LICENSEES, AND SUMP
STRAINER VENDORS TO DISCUSS THE RESOLUTION OF GENERIC
SAFETY ISSUE (GSI)-191

On August 23 and 24, 2007, Nuclear Regulatory Commission (NRC) staff met with representatives of NEI, PWROG, licensees, and sump strainer vendors in a public meeting at NRC headquarters in Rockville, Maryland. Enclosure 1 provides a list of those in attendance and individuals who participated via teleconference. Enclosure 2 is the meeting agenda. Information presented by the NRC and industry at the meeting is available in the NRC Agencywide Documents Access and Management System (ADAMS) under Accession No. ML072420564.

The purpose of this meeting was to discuss a variety of issues related to GSI-191 in order to manage the ongoing activities needed to bring GSI-191 to closure.

On August 23, 2007, the meeting was convened by the NRC GSI-191 Project Manager. The Director of the Division of Safety Systems in the Office of Nuclear Reactor Regulation and the NRC GSI-191 team leader followed with additional remarks and a review of the day's agenda.

Representatives of General Electric (GE) Hitachi and Pacific Gas and Electric Co. (PG&E) discussed the results of strainer tests with chemical effects for Diablo Canyon. The GE and PG&E representatives also presented results of fiber bypass testing, fuel grid testing, and strainer back flush testing for Diablo Canyon.

Representatives of Control Components, Inc., discussed the results of strainer tests with chemical effects and plans for further testing for plants in the United States.

Representatives from Alion discussed the results of their strainer tests with chemical effects and also discussed the results of alkyd coatings chemical testing. The Alion representative stated that a report will be developed to capture the results of this testing.

A representative from Performance Contracting, Inc. (PCI), provided a brief status of their plans for strainer tests with chemical effects. No materials were provided with this presentation. Six issues to be resolved were discussed in detail. Issue No. 1; during testing, PCI desires to place large debris on the floor of the test flume to model the large debris that will be created during a LOCA. The NRC staff stated that the staff believes that placement of the large debris is unpredictable and such treatment could be potentially non-conservative due to the potential random nature of its distribution. Issue No. 2; PCI intends to introduce fine fibrous debris and small fibrous debris into the test flume at the same time because this is likely prototypical of the introduction of debris during an event. The NRC staff stated that the staff believes that PCI should demonstrate that the small debris will not interfere with the transport of the fine debris non-prototypically in order to ensure that this method is prototypical or conservative. Without evidence providing a basis for adding both types of debris at the same time, the conservative method for debris introduction would be to introduce the fine fibrous debris first, followed by the small fibrous debris. Issue No. 3; PCI plans to introduce all debris to the flume as far from the test strainer as possible. The NRC staff stated that the staff believes that this method is potentially non-conservative. Although much debris may enter the sump pool relatively far from the strainer, a fraction of the debris would enter the pool on top of the strainer and at other locations near the strainer. The debris introduction location should be shown to be conservative or prototypical in accordance with any debris generation and transport study done for the plant configuration being tested. Issue No. 4; PCI plans to test high-fiber conditions for all plants and then observe the strainer surface to determine whether a thin bed test is also necessary. The NRC staff stated that the staff agrees that if a full fiber test is run and significant portions of screen are clear, that a thin bed test need not be run. The staff has a potential concern that PCI may be taking a liberal definition of clear screen area. Some of the PCI acceptance criteria for determination of requiring a thin bed test have centered around sudden increases in head loss and the ability to view the shape of the strainer. The NRC staff position is that there must be significant clear screen area following a full load test to obviate the need to perform a thin bed test. Issue No. 5 was in regard to the modified acceptance criteria for precipitate settlement in Westinghouse Topical Report WCAP-16530. NRC staff stated that revised acceptance criteria were discussed with the PWR Owners Group and that both parties found the revised values acceptable. Issue No. 6; PCI plans to use an average flow velocity during strainer testing. The average will be determined by a Computational Fluid Dynamics analysis of the licensee's strainer configuration under anticipated accident conditions. The NRC staff stated that the staff believes that an average velocity value may not be conservative if there is significant variation in the velocity and turbulent kinetic energy in the pool near the strainer. Depending on the variations in parameters that affect transport in the near field of the strainer, a flow velocity multiplier may have to be used to ensure conservatism in the testing. The staff concluded the discussion by noting that any proposed testing approach may be used if appropriately and adequately justified.

A representative from Atomic Energy Canada Limited (AECL) provided an update of planned chemical effects testing for Dominion. No materials were provided with this presentation. NRC staff commented that AECL should send its protocol prior to a proposed September phone call on the subject. Testing is to be conducted in October. NRC staff expressed a desire to observe the testing and requested that a notice be sent to the NRC as soon as possible to facilitate travel arrangements for NRC staff.

Representatives of the NRC discussed additional NRC-sponsored chemical tests. During the presentation, NRC staff clarified that draft guidance for review of licensee chemical effects evaluations, to be provided via a letter to NEI, will be available in September. The staff also

provided preliminary comments on WCAP-16785-NP, "Evaluation of Additional Inputs to WCAP-16530-NP" (See ML072420564).

Public comments were requested at two points during the meeting. None were provided.

After this, the meeting was adjourned for the day.

On August 24, 2007, the meeting was convened by the NRC GSI-191 Project Manager. The NRC GSI-191 team leader followed with additional remarks and a review of the day's agenda.

Representatives of the NRC discussed progress on the review and approval of Westinghouse Topical Report, WCAP 16406-P, Revision 1, "Evaluation of Downstream Sump Debris Effects in Support of GSI-191." The NRC stated that all requests for additional information have been issued to Westinghouse. The NRC stated that licensees have enough information (including staff requests for additional information (RAIs) and licensee responses to them) to use WCAP 16406-P, Revision 1, prior to approval of the related Safety Evaluation.

Representatives of the PWROG discussed progress on the development of the responses to the RAIs to WCAP 16406-P, Revision 1. Westinghouse representatives stated that all RAIs have been addressed and an amended draft incorporating RAI responses would be submitted by September 7, 2007. A training Session web cast on the amended WCAP would be hosted on the PWROG website in the middle of September 2007.

Representatives of the PWROG discussed progress on the development of WCAP 16793-NP, "Evaluation of Long Term Core Cooling Associated with Sump Debris Effects." A representative of the NRC staff provided a review schedule for this report, and provided a status of the ongoing review, stressing that a timely receipt of the responses to the RAIs was critical for meeting the November 2007 goal to issue the draft safety evaluation. NRC staff noted that the schedule may change, based on the development of and the response to the remaining RAIs on the topical report. At the end of this discussion, NRC staff raised the question on how a spreadsheet calculation tool, mentioned by PWROG representatives, was to be used to implement the WCAP; and whether its development, quality assurance, and use should be evaluated in the final safety evaluation.

Representatives of NEI discussed the Content Guide for Generic Letter (GL) 2004-02 Supplemental Responses (ADAMS Accession Number ML071060091). NRC staff provided amplifying information on several areas in the content guide. The NRC stated that it would accept a schematic diagram, a piping and instrumentation diagram or a reference to a previously submitted Final Safety Analysis Report piping and instrumentation diagram to satisfy bullet 1 of paragraph 3f, "Head Loss and Vortexing." NRC staff amplified what is required to satisfy various items in paragraph 3g, "Net Positive Suction Head (NPSH)," and paragraph 3c, "Debris Characteristics."

NRC staff responded to questions raised by licensees as to what specifically would constitute a complete response to item 2(a) in the GL regarding regulatory compliance. NRC staff stressed that as a minimum all analyses and modifications should be made by December 31, 2007. The NRC staff will be flexible within the regulatory framework to accommodate incomplete administrative issues related to a licensee's update to their licensing basis. The NRC staff stressed the importance of prompt notification if it becomes apparent that a licensee cannot meet the supplemental response due date. NRC staff also reminded licensees that for

licensees who have received an extension, submittal of all relevant and available information is expected on December 31, 2007.

There was a brief discussion on what situations could potentially cause the need for an extension request (such as the late receipt of unfavorable test results which had conservative assumptions). The NRC staff stated that it would evaluate these situations on a case-by-case basis, and the key to success is prompt notification of the NRC.

There was a brief discussion on what the result would be on operability in light of unfavorable test results. NRC staff clarified that, because the test methodology is known to generally be conservative, an unfavorable test result would likely lead to an "indeterminate" evaluation of the subject of the GL for that plant. Appropriate regulatory actions would be needed in such cases.

Representatives of NEI discussed several proposed "Illustrative Examples" of Content Guide responses which were provided in a draft document to the NRC at the meeting. The purpose of this document is an attempt to provide a more uniform response by licensees in detail and content. The document provides licensees a series of sample responses. NEI requested NRC staff review and provide input for a later revision of the document. NRC staff provided some initial feedback on the illustrative example for item 3 h. "Coatings Evaluation." It was agreed that a separate phone call on the entire document would be held in September. NEI stated that this document would be subject to frequent revision and will continue to move forward with further development of the document. NRC staff stated that only one informal review of this document could be conducted by NRC staff.

The Director of the Division of Safety Systems in the Office of Nuclear Reactor Regulation provided a brief overview of the two-stage review process for the GL responses. The Director and NRC staff responded to a licensee's concern that there is a tendency to wait for the issuance of the closure letter to the site prior to updating license basis information. NRC staff stressed that, due to expected length of time needed for review and approval of each response, it would be advisable for licensees to commence update of their licensing basis at the time of their response to the GL.

A licensee requested more specific guidance as to whether prior NRC permission is needed before implementing new licensing bases that describe the methodology used to evaluate sump performance. The NRC Director of the Division of Safety Systems stated that NRC will respond to this question shortly.

A representative of the PWROG discussed NRC GSI-191 resolution open issues specific to Combustion Engineering (CE) plants. The issues relate to an identified single mode failure where the Low Pressure Safety Injection (LPSI) pump fails to trip upon automatic initiation of recirculation. This condition could result in a 10- to 30-minute time frame of higher ECCS flow until the LPSI pump is secured. This period of time raises strainer clogging and structural integrity concerns. Several strategies were proposed to deal with these concerns at CE plants with single strainer and redundant strainer designs. NRC staff provided brief comments on the proposed strategies and potential failure modes.

The following action items were agreed to:

1. NRC will send NEI draft guidance for review of licensee chemical effects evaluations by end September 2007.

2. AECL will provide chemical effects testing protocols to the NRC staff and as soon as they become available.
3. NEI will provide an electronic version of the "Illustrative Examples of Content Guide Responses" document to NRC staff.
4. NRC staff and NEI will arrange and hold a conference call to discuss the "Illustrative Examples of Content Guide Responses" document.
5. NRC will provide NEI and the concerned licensee an answer on prior NRC approval of the proposed sump methodology.

Public comments were requested at the end of the meeting. None were provided.

The next meeting was tentatively scheduled for October 24, 2007. After this, the meeting was adjourned.

Enclosure 1: List of Attendees
Enclosure 2: Meeting Agenda

2. AECL will provide chemical effects testing protocols to the NRC staff and as soon as they become available.
3. NEI will provide an electronic version of the "Illustrative Examples of Content Guide Responses" document to NRC staff.
4. NRC staff and NEI will arrange and hold a conference call to discuss the "Illustrative Examples of Content Guide Responses" document.
5. NRC will provide NEI and the concerned licensee an answer on prior NRC approval of the proposed sump methodology.

Public comments were requested at the end of the meeting. None were provided.

The next meeting was tentatively scheduled for October 24, 2007. After this, the meeting was adjourned.

Enclosure 1: List of Attendees
Enclosure 2: Meeting Agenda

ADAMS ACCESSION NUMBER: Package: ML072420564; Memo: ML072530885

OFFICE	LA:DPR:PGCB	PM:DPR:PGCB	PM:DPR:PGCB	BC:DSS:SSIB	BC:DPR:PGCB
NAME	CHawes	JO'Driscoll	JGolla	MScott	MMurphy
DATE	09/11/2007	09/13/2007	09/13/2007	09/25/2007	09/13/2007

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List of Attendees for August 23 and 24, 2007,
Meeting of NEI, Industry, and NRC

August 23, 2007	
Name	Organization
Anthony Jackson	Duke Energy
Michael Kai	Dominion
Joe Gasper	OPPD
Tom Kendall	NMC-Point Beach
Jeremy Fischer	NMC- Point Beach
Mike Franklin	Progress Energy
Sue Simpson	AEP/DC Cook
Paul Schoeph	AEP/DC Cook
Dan Brosnan	PG&E/Diablo Canyon
Jim Furman	GEH
Andy Kaufman	Continuum Dynamics Inc.
Greg Ferguson	Entergy/WF3
Nicholas Petit	Entergy/WF3
Thomas Engbring	Arizona Public Service
Robert Peterson	Sargent & Lundy
Mark Coleman	PG&E Diablo Canyon
Marwan Charrouf	MPR Associates
Arun Puri	Constellation Energy
George Goralski	Entergy Palisades
Michael Scott	NRC
Paul Klein	NRC
Tim Andreychek	Westinghouse

List of Attendees for August 23 and 24, 2007,
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August 23, 2007	
Name	Organization
Maurice Dingler	WCNOC/PWROG
John Maruschak	Westinghouse
Erdal Caba	Progress Energy
Wes M ^c Goun	Progress Energy
Gary Miller	Dominion
Gordon Hart	Alion/Artek
Dale M. Vincent	Nuclear Management Company
Mike Staley	Nuclear Management Company- Prairie Island
Chuck Feist	Luminant Power
Chris Kudla	PCI
Jim Bleigh	PCI
Elizabeth Mistele	OPG
David Guzonas	AECL
Gilbert Zigler	Alion S&T
Aaron Smith	Enercon
Kiran Mathur	PSEG
Matt Yoder	NRC/DCI
David J. Distel	Exelon
Joe Golla	NRC
James O'Driscoll	NRC
Victor Linnenbom	FENOC
Ed Kimotoe	SCE
André Drake	Constellation Energy

List of Attendees for August 23 and 24, 2007,
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August 23, 2007	
Name	Organization
Shannon Burke	Progress Energy
Steven Unikewicz	NRC
Steve Smith	NRC
Ralph Architzel	NRC
Natalie Mosher	Entergy/ANO
Jon Stinson	CCI
Roger Waters	Entergy/IPEC
Leland Cerra	Entergy/IPEC
Ken Petersen	USA/STARS
Brian Dunn	FPL
John Butler	NEI
Brian Davenport	Exelon
Dave Midlik	Southern Nuclear
Jimmy Cash	Southern Nuclear
Ervin Geiger	NRC
Rob Tregoning	NRC
Thomas Harding Jr.*	Constellation/Ginna

* Participated Via Teleconference

List of Attendees for August 23 and 24, 2007,
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August 24, 2007	
Name	Organization
Maurce Dingler	WCNOC/PWROG
Wes M ^c Goun	Progress Energy
Nicholas Petit	Entergy/WF3
Greg Ferguson	Entergy/WF3
Mark Coleman	PG&E/Diablo Canyon
Elizabeth Mistele	OPG
Chris Kudla	PCI
Jay Basken	Enercon
Jim Bleigh	PCI
Tom Kendall	NMC-Point Beach
Jeremy Fischer	NMC-Point Beach
John Broschak	Entergy Palisades
George Goralski	Entergy Palisades
Brian Dunn	FPL
Jimmy Cash	Southern Nuclear
Joe Gasper	OPPD
Robert Peterson	Sargent & Lundy
Thomas Engbring	Arizona Public Service
Leland Cerra	Entergy/IPEC
Aaron Smith	Enercon
Gilbert Zigler	Alion S& T
Roger Waters	Entergy/IPEC
Natalie Mosher	Entergy/ANO

List of Attendees for August 23 and 24, 2007,
Meeting of NEI, Industry, and NRC

August 24, 2007	
Name	Organization
Arun Puri	Constellation Energy
Michael Kai	Dominion
Sue Simpson	AEP/DC Cook
Paul Schoepf	AEP/DC Cook
Dale M. Vincent	Nuclear Management Company
Anthony P. Jackson	Duke Energy
Mike Staley	Nuclear Management Company- Prairie Island
Ken Petersen	USA/STARS
Gary D. Miller	Dominion
Charles K. Feist	Luminant Power
John Maruschak	Westinghouse
Paul Klein	NRC
Matt Yoder	NRC
John Lehning	NRC
Steve Smith	NRC
John Burke	NRC
Shannon Burke	Progress Energy-Crystal River
Mike Franklin	Progress Energy
Ed Kimoto	SCE
Vic Linnenbom	FENOC
Kiran Mathur	PSEG
Joe Golla	NRC
James O'Driscoll	NRC

List of Attendees for August 23 and 24, 2007,
Meeting of NEI, Industry, and NRC

August 24, 2007	
Name	Organization
Pat Furio	CEG
Brian Davenport	Exelon
Dan Brosnan	PG&E Diablo Canyon
Timothy S. Andreychek	Westinghouse
Steven Unikewicz	NRC
Walton Jensen	NRC

AGENDA
AUGUST 23, 2007

8:30-8:45	Introduction and meeting purpose	NRC/NEI
8:45-10:15	Results of strainer testing with chemical effects	GE/PGE
10:15-10:30	Break	
10:30-12:00	Results of strainer testing with chemical effects	CCI
12:00-12:15	Opportunity for public comments or questions	Public/NRC
12:15-1:15	Lunch	
1:15-2:45	Results of strainer testing with chemical effects	Alion
2:45-3:00	Break	
3:00-4:30	Results of strainer testing with chemical effects	PCI
4:30-4:45	Opportunity for public comments or questions	Public/NRC
4:45	Adjourn	

AGENDA
AUGUST 24, 2007

9:00-10:00	Discussion on supplemental responses to GL 2004-02	NRC/NEI
10:00-11:00	Discussion on NRC review of industry technical reports	NRC/PWROG
11:00-11:30	Wrap-up	NRC/NEI
11:30-11:45	Opportunity for public comments or questions	Public/NRC
11:45	Adjourn	

Memorandum to Michael L. Scott from James O'Driscoll

SUBJECT: MEETING SUMMARY OF PUBLIC MEETING WITH NEI AND INDUSTRY ON
AUGUST 23 AND 24, 2007, TO DISCUSS TOPICS RELATED TO GSI-191

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