February 4, 2010

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

FROM: Joseph A. Golla, Project Manager ***/RA/***
Generic Communications and Power Uprate Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JANUARY 14, 2010, PUBLIC MEETING WITH THE BOILING WATER REACTOR OWNER'S GROUP, TO DISCUSS THE REVIEW OF IN-VESSEL DOWNSTREAM EFFECTS FOR BOILING WATER REACTORS

On January 14, 2010, Nuclear Regulatory Commission (NRC) staff met with representatives of the Boiling Water Reactor Owner's Group (BWROG), in a public meeting in Rockville, Maryland. Enclosure 1 provides a list of those in attendance. Enclosure 2 is the meeting agenda. Non-proprietary information presented at the meeting is available in the NRC Agencywide Documents Access and Management System (ADAMS) under Accession No. ML100340899.

This meeting was a followup to a meeting held on October 21, 2009. The meeting summary for the October 21, 2009, meeting may be viewed at ADAMS Accession No. ML093000602. The purpose of the January 14, 2010, meeting was for the BWROG to address technical questions from the NRC staff that resulted from the October 21, 2009, meeting. The subject of both of these meetings was the final analytical results of the review of in-vessel downstream effects performed for boiling water reactors (BWRs) by the BWROG and General Electric-Hitachi (GEH). A large portion of these meetings was closed to public participation due to the proprietary nature of the technical material presented and discussed.

After opening remarks by NRC and the BWROG, Mr. Harry Goodman, Vice-Chairman of the BWROG Suction Strainers Committee, presented an updated briefing regarding the BWROG's overall plans and schedule for addressing in-vessel downstream effects. The plan includes preparing three licensing topical reports (LTRs) for NRC review and approval. The first of these LTRs, LTR 1, will generically analyze blockage effects for determination of limiting conditions and applies those conditions to the testing of the "Global Nuclear Fuel" fuel bundle design. LTR 1 will include the fuel bundle testing plan. It is planned that later revisions to this LTR will provide test results.

The testing of the two other BWR fuels, AREVA and Westinghouse, will be treated in separate LTRs similar to LTR 1. LTR 2 will be prepared for AREVA BWR fuel and LTR 3 will address Westinghouse BWR fuel. It was stated by Mr. Goodman that the overall approach is to produce one test plan and to use different test criteria (e.g., debris source terms, bypass fraction, chemical effect, etc.) for the different fuel types. Before the BWROG commits significant funds to testing it will await completion of NRC review of LTR 1.

Slide no. 7 of Mr. Goodman's presentation indicates that screen bypass fraction might be determined analytically or by separate testing. Mr. Michael Scott, Chief of the Safety Issues Resolution Branch of the Division of Safety Systems (DSS), Office of Nuclear Reactor Regulation (NRR) inquired about the schedule for determination of the need for bypass testing and the development of the LTRs. In particular, if it is determined by the BWROG that bypass fraction testing is needed, then what would be the impact on the LTRs? Mr. Goodman indicated that bypass fraction testing will be conducted in parallel with the development of the LTRs. The debris source terms would be developed conservatively such that the bypass testing would, in effect, be confirmatory testing. Mr. Scott advised the BWROG to have a plan for use if things don't go well, i.e., should the bypass fraction testing indicate a need for a higher source term in the actual fuel bundle testing then the BWROG should learn this in time to incorporate it into their bundle testing, the first time, and preclude the need for retesting. Mr. Scott indicated that he would like to have a meeting with the BWROG to further discuss plan development and scheduling issues of this nature. He indicated he would also like to discuss plans and schedule being developed for chemical effects testing. A late March 2010 time frame was tentatively agreed upon for this public meeting.

BWROG representatives stated that calculations that support the test plan, the test plan, and details of the test apparatus will be in LTR 1. Mr. Scott indicated that the staff expects a high level of detail regarding the description of the test apparatus. A BWROG representative stated that would be the case.

Mr. Anthony Mendiola, Chief of the Nuclear Performance & Code Review Branch (SNPB), DSS, NRR, asked if everything licensees would need to respond to staff would be in the LTRs. A BWROG representative stated that would be the case. Mr. Mendiola asked how mixed cores would be handled. Mr. Harry Goodman stated that third party contractors under his purview would respond to staff questions and issues related to mixed cores.

Mr. Michael Scott asked where mixed core issues would be addressed. Mr. Goodman stated that this needs to be worked out.

Mr. Stewart Bailey of the Division of Operating Reactor Licensing asked for clarification of how the methods under discussion would become part of a plant's licensing basis and whether they would be reflected in the Technical Specifications. BWROG representatives indicated this needs to be worked out. This will be a topic for discussion at the next meeting.

Dr. Peter Yarsky SNPB/DSS/NRR asked if fuel design criteria would be augmented, or bounded by what is already approved. The models in TRACG necessary to perform the analyses that will be described in LTR 1 have been previously approved by the NRC. In cases where the models associated with the important physical phenomena have not been previously reviewed and approved by the staff, Dr. Yarsky asked it the LTR 1 documentation would list these specific instances. BWROG representatives stated this would be addressed in LTR 1.

Mr. Michael Scott stated that any licensees with new fuel designs would have to perform their own testing.

Following this, for the remainder of the meeting, a briefing was given by Messers Jose Luis Casillas, Curt Robert, and Charles Heck of GEH, entitled "Follow-up BWR [loss-of-coolant accident] LOCA Long Term Cooling Fuel Effects to Debris Blockages." This briefing covered

information on LOCA licensing model, hot channel boundary and local conditions, BWR plant differences, and blockage characteristics. The material covered in this briefing was predominantly GEH proprietary information, therefore, no further discussion of it will be presented here. A member of the public who was present for the non-proprietary portion of the meeting was excused from the meeting room for the proprietary presentation and discussion.

At the end of the meeting Mr. Doug Coleman, Chairman of the BWROG, asked whether the NRC staff had concerns with using the proposed methodology to evaluate the effects of debris on core cooling. The staff responded that, while it had not reviewed the methods in detail and still needed to see how the analytical techniques would fit into the overall plant assessment and licensing basis, the staff looks forward to evaluating the BWROG LTR submittal.

Enclosure 1: List of Attendees
Enclosure 2: Meeting agenda

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ADAMS ACCESSION NUMBERS: ML100340923 (Package)
ML100340832 (Memo)
ML100340899 (Presentation)

OFFICE	LA:DPR:PGCB	PM:DPR:PGCB	BC:DSS:SNPB	BC:DSS:SSIB
NAME	CHawes	JGolla	TMendiola	MScott
DATE	2/04/2010	2/04/2010	2/04/2010	2/04/2010

List of Attendees for January 14, 2010,
Meeting With The BWROG

Jose Luis Casillas	GEH
Curt Robert	GEH
Harry Goodman	BWROG
Fred Emerson	GEH/BWROG
Charles Heck	GEH
William Slagle	Westinghouse
Craig Nichols	GEH
Steve Scammon	BWROG
Doug Coleman	BWROG
Rob Whelan	GEH/BWROG
Ralph Landry	NRC/NRO
Paul Klein	NRC/NRR
Mike Scott	NRC/NRR
Nageswara Karipineni	NRC/NRR
George Thomas	NRC/NRO
Len Ward	NRC/NRR
Tony Mendiola	NRC/NRR
Andrew Proffitt	NRC/NRR
Stew Bailey	NRC/NRR
William Krotiuk	NRC/RES
Greg Makar	NRC/NRO
Weidong Wang	NRC/ACRS
Zeechung Wang	NRC/RES
Peter Yarsky	NRR/NRR
Joe Golla	NRC/NRR

Enclosure 1

MEETING AGENDA
U.S. NUCLEAR REGULATORY COMMISSION (NRC)
FOLLOW UP MEETING WITH BOILING WATER REACTOR OWNER'S GROUP
(MOST OF THIS MEETING WILL BE CLOSED TO THE PUBLIC)

January 14, 2010

8:30-8:45	Introductions and meeting purpose	NRC
8:45-9:15	Update on plans and schedule for resolving in-vessel downstream effects	BWROG
9:15-9:30	Opportunity for public comment	Public/NRC
9:30-10:30	BWROG Presentation of BWR LOCA long term core cooling and discussion ****this portion closed to the public****	BWROG/NRC
10:30-10:45	Break	
10:45-12:00	BWROG Presentation of BWR LOCA long term core cooling and discussion ****this portion closed to the public****	BWROG/NRC
12:00-1:00	Lunch Break	
1:00-3:00	BWROG Presentation of BWR LOCA long term core cooling nd discussion ****this portion closed to the public****	BWROG/NRC
3:00-3:15	Break	
3:15-4:30	BWROG Presentation of BWR LOCA long term core cooling and discussion ****this portion closed to the public****	BWROG/NRC

4:30 Adjourn

Enclosure 2

Memorandum to Michael Scott from Joe Golla, dated

SUBJECT: SUMMARY OF PUBLIC MEETING ON JANUARY 14, 2010, WITH THE BWROG TO DISCUSS THE BWROG REVIEW OF IN-VESSEL DOWNSTREAM EFFECTS

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Michael Scott
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