



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

March 24, 2014

LICENSEE: Exelon Generation Company, LLC

FACILITY: Peach Bottom Atomic Power Station, Units 2 and 3

SUBJECT: SUMMARY OF CLOSED MEETING HELD ON MARCH 14, 2014, WITH EXELON GENERATION COMPANY, LLC TO DISCUSS STEAM DRYER ANALYSIS RELATED TO PROPOSED EXTENDED POWER UPRATE FOR PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 (TAC NOS. ME9631 AND ME9632)

On March 14, 2014, a closed meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Exelon Generation Company, LLC (Exelon, the licensee). The meeting was held at the office of Exelon's contractor, Westinghouse Electric Company LLC (Westinghouse) located at 12300 Twinbrook Parkway, Rockville, Maryland. The purpose of the meeting was to discuss changes to the steam dryer analysis related to the proposed extended power uprate (EPU) license amendment for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

The proposed amendment would authorize an increase in the maximum power level from 3514 megawatts thermal (MWt) to 3951 MWt. The requested change represents an increase of approximately 12.4 percent above the current licensed thermal power level. The proposed EPU application is dated September 28, 2012 (Agencywide Document Access and Management System (ADAMS) Accession No. ML122860201). The meeting was closed since the information discussed contained Westinghouse proprietary commercial information pursuant to Title 10 of the *Code of Federal Regulations*, Section 2.390.

The meeting notice and agenda, dated March 6, 2014, are available in ADAMS at Accession No. ML14063A386. A list of attendees is provided in the Enclosure. The licensee's handouts, presented at the meeting, contain proprietary information and are not publicly available.

The meeting included a discussion of NRC proposed license conditions intended to address potential adverse flow effects under EPU conditions. Specifically, the license conditions address verifying continued structural integrity of the steam dryer as well as vibration monitoring for piping and valves. The licensee discussed proposed changes to the license condition wording and presented examples of information that would be provided to the NRC, in accordance with the license conditions, during the power ascension process. It was agreed that further changes to the license conditions were needed and that it was a priority to finalize the wording.

With respect to proposed license condition 2.C(15) for PBAPS Unit 2, the following was decided:

- 1) For license condition 2.C(15)(a)1.c, the stress summary report will include end-to-end bias errors and uncertainties (B/Us), for the replacement steam dryer (RSD) strains, along with a demonstration that the application of these B/Us leads to RSD strain simulations that bound the measured root mean squared (RMS) strains at all active strain gauge locations. The NRC's contractors raised a concern that the dominant frequency peaks should be bounded during benchmarking at the current licensed thermal power (CLTP) level and at higher power levels if re-benchmarking is found to be necessary. It was agreed that Exelon would revise the proposed license condition wording to make clear that the dominant frequencies are bounded. Exelon will propose criteria to identify dominant frequencies in their current results. The licensee also agreed to provide a list of the dominant frequencies, which should also include safety relief valve peaks.
- 2) For license condition 2.C(15)(a)1.e, the licensee presented an example of the information that would be provided with respect to strains at the active RSD strain gauge locations. The licensee's example showed the Level 2 strain limit at 90 percent of the Level 1 strain limit. Based on past precedent, the NRC and its contractors indicated that the Level 2 strain limit was typically established at 80 percent of the Level 1 limit. The licensee agreed to set the Level 2 limit at 80 percent. This will require a change to Westinghouse report WCAP-17654-P, "Peach Bottom Unit 2 Replacement Steam Dryer Power Ascension Program Description for Extended Power Uprate," and the response to request for additional information EMCB-SD-RAI-32 which were both provided in Supplement 22 to the EPU application. The licensee also agreed to provide another curve during power ascension with the initial predicted strain data.
- 3) For license condition 2.C(15)(a)4.f, it was agreed that the words "near 3514 Mwt" could be deleted since the information to be provided at that power level is already covered under license condition 2.C(15)(a)1.
- 4) For license conditions 2.C(15)(a)5 and 2.C(15)(b)1, it was agreed that the words "allowable limits" in the first sentence should be clarified to read "allowable Level 1 limits."
- 5) For license condition 2.C(15)(b)1.c, the NRC agreed to review this condition further to determine if it could be deleted. It calls for the licensee to evaluate the effects of +/- 10 percent frequency shifts in the event that stress analyses need to be re-performed if the RMS measured strains exceed the allowable Level 1 limits. Further discussion on this issue is needed.

With respect to proposed license condition 2.C(15) for PBAPS Unit 3, the following was decided:

- 1) For license condition 2.C(15)(a)1, Exelon noted that some of the information required to be provided to the NRC by this license condition is provided before power ascension (revised RSD analysis) and some information is provided during power ascension (vibration summary report). As such, the license condition should be separated into two parts and renumbered accordingly. Exelon agreed to provide a proposed markup to address this issue.

The licensee also summarized the results of the revised steam dryer analysis as provided in the licensee's EPU Supplement 21 dated February 28, 2014 (ADAMS Accession No. ML14070A141), and Supplement 22 dated March 10, 2014 (ADAMS Accession No. ML14072A016). The licensee agreed to revise page 7-1 of Westinghouse report WCAP-17635P, "Peach Bottom Atomic Power Station Unit 2 and Unit 3 Replacement Steam Dryer Comprehensive Vibration Assessment Program (CVAP)," to reflect the reports required to be submitted in accordance with the license conditions.

The NRC and its contractors indicated that the licensee should provide a detailed step-by-step procedure of how the end-to-end B/Us were used to develop the benchmarking of the RSD in order to demonstrate the method is conservative. The NRC agreed to provide a request for additional information to detail the information that should be submitted.

Exelon will provide further information regarding operating experience with this RSD design (e.g., power level, flow rates) in order to support the proposed visual inspection program. The NRC staff and its contractors will review the proposed visual inspection program described in WCAP-17635-P and determine if any further changes are needed to proposed license condition 2.C(15)(f) for both units.

The licensee will revise Section 7 of Westinghouse report WCAP-17635-P to align the written reports to be submitted with the proposed license condition.

The licensee presented information regarding results of predicted RSD stresses and minimum alternating stress ratios at different locations in the RSD. Exelon will provide further information regarding the conservatism in this analysis.

It was agreed that further discussions would be needed following the detailed review of the information provided in EPU Supplements 21 and 22.

Please direct any inquiries to me at 301-415-1420, or Rick.Ennis@nrc.gov.



Richard B. Ennis, Senior Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosure:  
List of Attendees

cc w/encl: Distribution via Listserv

LIST OF ATTENDEES

MARCH 14, 2014, CLOSED MEETING WITH EXELON GENERATION COMPANY, LLC

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

STEAM DRYER ANALYSIS FOR PROPOSED EXTENDED POWER UPRATE

<b>Name</b>	<b>Organization</b>
Rick Ennis	NRC
Chakrapani Basavaraju	NRC
John Rommel	Exelon
Ken Ainger	Exelon
Kevin Borton	Exelon
Brian Voll	Exelon
Ron Janowiak	Exelon
Joe Ferrante	Exelon
Tom Zalewski	Westinghouse
David Suddaby	Westinghouse
David Forsyth	Westinghouse
Dave Neff*	Exelon
Jerry Burford*	Exelon
Steve Hambric*	NRC Contractor - Penn State
Vik Shah*	NRC Contractor - Argonne National Laboratory
Samir Ziada*	NRC Contractor - McMaster University

\* via telephone

Enclosure

The licensee also summarized the results of the revised steam dryer analysis as provided in the licensee's EPU Supplement 21 dated February 28, 2014 (ADAMS Accession No. ML14070A141), and Supplement 22 dated March 10, 2014 (ADAMS Accession No. ML14072A016). The licensee agreed to revise page 7-1 of Westinghouse report WCAP-17635P, "Peach Bottom Atomic Power Station Unit 2 and Unit 3 Replacement Steam Dryer Comprehensive Vibration Assessment Program (CVAP)," to reflect the reports required to be submitted in accordance with the license conditions.

The NRC and its contractors indicated that the licensee should provide a detailed step-by-step procedure of how the end-to-end B/Us were used to develop the benchmarking of the RSD in order to demonstrate the method is conservative. The NRC agreed to provide a request for additional information to detail the information that should be submitted.

Exelon will provide further information regarding operating experience with this RSD design (e.g., power level, flow rates) in order to support the proposed visual inspection program. The NRC staff and its contractors will review the proposed visual inspection program described in WCAP-17635-P and determine if any further changes are needed to proposed license condition 2.C(15)(f) for both units.

The licensee will revise Section 7 of Westinghouse report WCAP-17635-P to align the written reports to be submitted with the proposed license condition.

The licensee presented information regarding results of predicted RSD stresses and minimum alternating stress ratios at different locations in the RSD. Exelon will provide further information regarding the conservatism in this analysis.

It was agreed that further discussions would be needed following the detailed review of the information provided in EPU Supplements 21 and 22.

Please direct any inquiries to me at 301-415-1420, or Rick.Ennis@nrc.gov.

/ra/

Richard B. Ennis, Senior Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosure:  
List of Attendees

cc w/encl: Distribution via Listserv

**DISTRIBUTION:**

PUBLIC

Branch Reading

RidsAcrsAcnw\_MailCTR Resource

RidsNrrDorlLpl1-2 Resource

RidsNrrPM PeachBottom Resource

RidsNrrLAABaxter Resource

TWertz, NRR

JNick, EDO

RidsRgn1MailCenter Resource

BPurnell, NRR/DORL

CBasavaraju, NRR/DE

**ADAMS Accession No: ML14077A380**

OFFICE	LPL1-2/PM	LPL1-2/LA	LPL1-2/BC
NAME	REnnis	ABaxter	MKhanna
DATE	3/19/14	3/19/14	3/24/14

OFFICIAL RECORD COPY