

May 18, 2011

MEMORANDUM TO: Joseph Colaccino, Chief
EPR Projects Branch
Division of New Reactor Licensing
Office of New Reactors

FROM: Phyllis Clark, Project Manager **/RA/**
EPR Projects Branch
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Office of New Reactors

SUBJECT: FEBRUARY 15 - 16, 2011, HYDROLOGY REGULATORY AUDIT
SUMMARY FOR THE PSEG POWER, LLC AND PSEG NUCLEAR, LLC
EARLY SITE PERMIT APPLICATION

By letter dated May 25, 2010, PSEG Power, LLC and PSEG Nuclear, LLC submitted the PSEG Site Early Site Permit (PSEG Site ESP) application to the U. S. Nuclear Regulatory Commission (NRC) for review. As part of its review, the Hydrologic Engineering Branch (RHEB) conducted an audit of the documentation supporting Section 2.4 (Hydrology) of the Site Safety Analysis Report (SSAR). Particularly, the staff audited the methodology, analysis, calculations and modeling results in support of the Hydrology section of the application.

The staff reviewed documents at the PSEG Energy and Environmental Resource Center in Salem, New Jersey, on February 15 - 16, 2011 (see the Audit Plan at Agencywide Documents Access and Management System (ADAMS) Accession No. ML110320606). The staff discussed hydrologic engineering topics that included the site setting, and potential effects of floods, dam failures, surge and seiche, tsunamis, ice effects, low water considerations, groundwater, and accidental releases of radioactive liquid effluent in groundwater and surface waters for the proposed site. The staff developed an initial list of 148 information need items identifying a total of 35 potential requests for additional information (RAIs).

J. Colaccino

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Enclosed with this memorandum are materials relevant to this audit. The enclosures are as follows: (1) Hydrology Audit Summary, (2) Hydrology Audit Agenda, (3) Hydrology Audit Participants, and (4) Trip Report - PSEG Hydrology Site Safety Audit.

Docket No. 52-043

Enclosures:

As stated

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ADAMS Accession No.: ML111320176 Pkg *vie e-mail

NRO-002

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PSEG SITE EARLY SITE PERMIT APPLICATION HYDROLOGY AUDIT SUMMARY

1. Background

PSEG Power, LLC and PSEG Nuclear, LLC submitted ground and surface water modeling documentation to the U.S. Nuclear Regulatory Commission (NRC) as part of their PSEG Site Early Site Permit (ESP) application. In preparation for the audit, the staff reviewed the documentation within Section 2.4 of the Site Safety Analysis Report (SSAR) and identified information needs that would promote a better understanding of the detailed analyses and bases underlying the formal application.

Additionally, in conjunction with the audit, several members of the staff visited the proposed site location in an effort to become familiar with the site layout. This provided the staff with more insight as to the relevance of the information needs that were identified during the staff's initial review of Section 2.4 of the SSAR. During the audit, the staff reviewed ground and surface water models, supporting modeling documentation and calculation packages. The audit allowed the staff to better understand the modeling results in order to make accurate safety conclusions concerning site characteristics and assess the radiological consequences of accidental releases to ground and surface water. It also assisted the staff in identifying requests for additional information needed to allow the staff to conduct a complete review of the PSEG Site ESP application.

2. Regulatory Basis

10 CFR Part 100
10 CFR Part 50
10 CFR 52.17
10 CFR 52.79

3. Documents Reviewed

Early Site Permit (ESP) Application, Rev. 0, Section 2.4
Information Needs (See Audit Plan at ML110320606)

4. Audit Results

See ML110950380

**PSEG Site Early Site Permit
Hydrology Audit 2011 Agenda
February 15 – 16, 2011**

Tuesday (02/15/11) – 8:30 a.m. – 5:30 p.m.

Meeting at site/PSEG offices - All

Site briefing and application overview – PSEG staff

Site tour - All

Lunch break

Begin Audit – All

Breakout sessions - All

Daily debrief – NRC and PSEG

Wednesday (2/16/11) – 8:30 a.m. – 5:30 p.m.

Breakout sessions continue

Lunch

Final briefing and close out – NRC and PSEG

**PSEG Site Early Site Permit
Hydrology Audit 2011 Participants
February 15 – 16, 2011**

Name	Affiliation	Name	Affiliation
Jill Caverly	NRC	Dave Lewis	PSEG
Joe Giacinto	NRC	James Mallon	PSEG
Henry Jones	NRC	David Robillard	PSEG
Joseph Kanney	NRC	Jeffrey Pantazes	PSEG
Phyllis Clark	NRC	Mike Wiwel	PSEG
Dan Goode	USGS	Gary Ruf	PSEG
Patrick Lynette	USGS	Daniel Blount	Sargent & Lundy
Jason Chator	USGS (via phone)	Ira Owens	Sargent & Lundy
Tony Navoy	USGS	Michael Shervin	Sargent & Lundy
Gary Patterson	USGS	Stephen Criscenzo	MACTEC
Amy McHugh	USGS	Louise Slate	MACTEC
Robert Schopp	USGS	William Tucker	MACTEC
Jason Chaytor	USGS	Nelson Breton	MACTEC
Christopher Bender	Taylor Engineering	Ronald Lewis	MACTEC
Chris Bender	NUMARK Associates	Charlene Stroehlen	MACTEC
Mike Hauptmann	Brookhaven National Lab	N. Guy Winebrenner	MACTEC
Keith Klaus	Brookhaven National Lab	Anthony Bonasera	GEOMAP
		Jim Kirby	Univ. of Delaware
		Fengyan Shi	Univ. of Delaware

TRIP REPORT
PSEG HYDROLOGY SITE SAFETY AUDIT
February 15 - 16, 2011

Prepared by:

1. Gary L Patterson, U.S. Geological Survey (USGS) (Sections 2.4.1-2.4.4 and 2.4.7-2.4.11)
2. Christopher Bender, Taylor Engineering, Inc., and Richard Codell, NUMARK Associates (Section 2.4.5)
3. Jason Chaytor, USGS, Woods Hole, MA, and Pat Lynett, Texas A&M University, College Station, TX (Section 2.4.6)
4. Mike Hauptmann, Brookhaven National Laboratory and Keith Klaus, Brookhaven National Laboratory (Sections 2.4.12-2.4.13)

On February 15 - 16, 2011, NRC, USGS, and other PSEG Safety Review Team member organizations conducted the Hydrology Safety Site Audit at the PSEG Energy and Environmental Resource Center (EERC) in Salem, New Jersey and at the proposed Salem-Hope Creek Nuclear Power Plant site near Salem, New Jersey. The purpose of the audit was to discuss information needs identified by the staff based on review of FSAR Section 2.4 of the PSEG Salem-Hope Creek Early Site Permit (ESP) application.

1. USGS Surface Water Audit Summary

On the morning of February 15, 2011, the staff met with the applicant at the EERC. USGS employees attending were Gary Patterson from the Office of Groundwater, Denver, Colorado, and Amy McHugh and Robert Schopp from the New Jersey Water Science Center, Trenton, New Jersey. After a brief introduction to the Company, the general area, and the Salem-Hope Creek site, the staff travelled by bus to the Salem-Hope Creek generating plant and the proposed location of the new reactors. The field trip included a tour of the proposed location of the expanded nuclear island, proposed location of the water intake in the Delaware estuary, and a climb to the top of an observation tower to get a panoramic view of the site. The site visit was valuable to those members of the review team not familiar with the geographical features of the area.

After the field trip the staff reconvened at the EERC to discuss resolution of the information needs identified during the initial review of the FSAR to discuss the information needs and how they will be resolved. During the afternoon of February 15, 2011, the USGS staff focused on surface water issues with the surface water subject matter experts responsible for the FSAR. Several issues, largely regarding data used for the FSAR analyses, were discussed and resolution was determined for most data issues.

The staff reconvened on the morning of February 16, 2011. The issues remaining primarily focused on the surface water modeling and treatment of dam failure scenarios presented in the FSAR. The USGS staff was joined by another member of the USGS review team, Daniel Goode, modeling expert from the USGS, Pennsylvania Water Science Center. Several issues regarding the modeling were discussed. Resolution was reached on some; others were deferred until the USGS can perform confirmatory modeling and independent analyses. All model input and output files are being requested to allow the confirmatory analyses.

ENCLOSURE 4

Late in the Afternoon of February 16, 2011, a final closeout meeting was held to discuss resolution of the information needs originally identified, and to discuss new issues identified during the audit. The staff reviewed the over resolution to each information need with the applicant experts so that everyone understood the resolution requirements and the meeting adjourned.

The discussion of information needs resulted in several resolutions and open items with clearly identified resolutions. Some of the issues, however, could not be fully resolved and will likely result in the issuance of requests for additional information (RAI's).

2. Numark Associates Surge and Seiche Audit Summary

On the morning of February 15, 2011, the staff traveled to the Salem / Hope Creek site for a tour, particularly to see existing and proposed features and their influence or relevance to storm surge and seiche. The staff had the opportunity to view the proposed location relative to open water, existing power plant infrastructure, and marsh areas surrounding the project site. The staff noted several key site features, including the location of existing infrastructure relative to the proposed plant and the mouth of Delaware Bay. Other notable features included a dike (oriented east west) located along the shoreline south of the proposed site and bulkheads (oriented north south) located west of the existing infrastructure.

During the afternoon of February 15, 2011, and the morning and afternoon of February 16, 2011, the staff reviewed calculation packages and some site drawings the applicant furnished. These reviews focused on information that would help resolve information needs.

Late in the afternoon on February 16, 2011, the staff met for a final closeout meeting to reach consensus on information needs originally identified, and to discuss issues raised during the site tour. Several items, resolved during the audit, require no further actions. However, the staff identified unresolved items that may require staff to prepare RAIs.

3. USGS Tsunami Audit Summary

On February 16, 2011, the staff traveled to the Salem / Hope Creek site for a tour and to review calculation packages. Jason Chaytor attended the audit via conference call.

Of the 19 Information Needs related to Section 2.4.6 of the SSAR, five were completely resolved during the site audit. Four RAIs, some which cover multiple information needs, are likely to result from the audit.

4. BNL Groundwater Site Audit Summary

On the morning of February 15, 2011, the staff met with the applicant to review the agenda for conducting the site audit and information needs discussion sessions. In the afternoon of February 15, 2011, the staff began the review of the preliminary information needs, site drawings, and calculation packages furnished by the applicant. These reviews focused on information that would help resolve the information needs. The discussions continued on the next day, February 16, 2011, into the afternoon until all groundwater related information needs had been addressed.

Also on February 15, 2011, the staff traveled to the Hope Creek site for a tour of the site, particularly emphasizing drainage, wetlands, and stream features. The staff had the opportunity to walk along the bank areas of the Delaware River and had an overview of principal streams and ponds from a firing range tower located just south of the proposed plant site. The staff noted several key features of the site, including the proximity of the Delaware River to the power block area, the large size of the Delaware estuary, and the extent of the marshes and tidal streams (north) of the site.

The staff viewed the proposed Delaware River intake and discharge locations on the east bank of the river. The approximate locations of the existing Salem Units 1 and 2 and Hope Creek Unit 1 discharge pipes were identified during the tour. An apparent surface mixing plume was visible.

At the end of the information needs discussions, in the afternoon of February 16, 2011, a final closeout meeting was held to discuss resolution of the information needs originally identified. It was noted that several groundwater information needs could be resolved with further clarification of the text in the applicant's FSAR. These clarification needs included further discussion of the tidal effects from the Delaware River on groundwater flow and more detail about the conceptual site model's conservatism.

Several items were resolved during the audit and require no further actions. However the staff identified unresolved items that will result in the need for the staff to prepare RAIs.

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(Revised 05/17/2011)

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