

**Official Transcript of Proceedings**  
**NUCLEAR REGULATORY COMMISSION**

Title: PSEG Power, LLC and PSEG Nuclear, LLC  
Early Site Permit Application

Docket Number: 52-043-ESP

ASLBP Number: 15-943-01-ESP-BD01

Location: Rockville, Maryland

Date: Thursday, March 24, 2016

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD PANEL

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HEARING

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In the Matter of:	:	Docket No.
PSEG POWER LLC and	:	52-043-ESP
PSEG NUCLEAR LLC,	:	ASLBP No.
(Early Site Permit	:	15-943-01-ESP-BD01
Application)	:	

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Thursday, March 24, 2016

Nuclear Regulatory Commission

Hearing Room T2B45

11545 Rockville Pike

Rockville, Maryland

BEFORE:

PAUL S. RYERSON, Chair

DR. GARY S. ARNOLD, Administrative Judge

DR. CRAIG M. WHITE, Administrative Judge

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PSEG

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## P R O C E E D I N G S

(9:01 a.m.)

CHAIR RYERSON: Well, good morning again, and welcome, everyone. We have a full house today. So, I think we have people standing in the back. And if people want to squeeze in a little bit we could get a few more people sitting down. That's up to you. Not too many takers for seats yet.

We're here this morning concerning an Early Site Permit Application by PSEG Power LLC and PSEG Nuclear LLC, which we'll call collectively PSEG, if that's okay with everyone.

I'm Judge Ryerson. I'm a legally trained judge, and I chair the particular Atomic Safety and Licensing Board that the NRC has established for this particular matter. On my right is Judge Arnold. Dr. Arnold is a nuclear engineer. And on my left is Judge White. Dr. White is a geologist.

With that, let's take the appearances of counsel today, starting with PSEG.

MR. BURDICK: Good morning. My name is Stephen Burdick. I'm a partner with the law firm of Morgan, Lewis & Bockius. I'm joined on my right by Jeff Keenan.

MR. KEENAN: Yes. Jeff Keenan, PSEG

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1 Nuclear.

2 MR. BURDICK: And welcome to both of you.  
3 And the NRC staff?

4 MR. ROACH: Good morning. My name is  
5 Kevin Roach, Counsel for the NRC staff.

6 MS. HOVE: Hi. My name is Ann Hove, and  
7 I'm Counsel for the NRC staff.

8 CHAIR RYERSON: Welcome to you. The  
9 purpose of today's proceeding is to conduct what is in  
10 some ways an unusual type of hearing. It's an  
11 uncontested hearing that's required by the Atomic  
12 Energy Act, and by the NRC's regulations.

13 This uncontested hearing concerns PSEG's  
14 request for approval of a site for a potential new  
15 nuclear power reactor facility that would be adjacent  
16 to two existing nuclear facilities in Salem County,  
17 New Jersey.

18 PSEG and the NRC staff have agreed with  
19 the Board on six safety related issues, and four  
20 issues under the National Environmental Policy Act,  
21 that the Board must decide in this proceeding. And I  
22 won't read them all. They're set forth as an appendix  
23 to the Board's scheduling order in this case.

24 As the Commission has explained, the Board  
25 has what the Commission has called an important but

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1 limited role in these types of cases. Our  
2 responsibility is to probe the logic and the evidence  
3 supporting the NRC staff's findings, and to decide  
4 whether those findings are sufficient. We are not  
5 supposed to replicate or repeat all of the NRC staff's  
6 work.

7 As to the issues under the National  
8 Environmental Policy Act we have a somewhat different  
9 responsibility. There the Board is to independently  
10 consider the final balance among conflicting factors  
11 that are contained in the total record of the  
12 proceeding. And make a determination whether the  
13 final balance supports issuance of a license.

14 But even here we do not reconsider the  
15 staff's underlying factual determinations, technical  
16 and factual determinations, unless after a review of  
17 the record we find the staff's review to be  
18 inadequate, or its findings insufficient.

19 I really should emphasize that as in many  
20 NRC hearings, what happens in this hearing room today  
21 is really the proverbial tip of the iceberg. We are,  
22 in fact, near the end of a long process that began  
23 first with the Board Members' review of portions of  
24 the application itself, followed by a very thorough  
25 review of both the NRC staff's Safety Evaluation

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1 Report, which was issued in September of last year,  
2 and the staff's Final Environmental Impact Statement,  
3 which was issued in November.

4 After we went through those materials the  
5 Board came up with two sets of questions dealing with  
6 environmental and safety related issues, a total of  
7 about 90 questions I believe, that the parties  
8 responded to with 100 pages, responses that we  
9 received. All of those were under oath, and submitted  
10 by a total of some 36 responding individuals on behalf  
11 of both PSEG and the NRC staff.

12 After the Board looked at those we  
13 identified 14 topics for further sworn pre-filed  
14 testimony in advance of the hearing. Again, both some  
15 issues dealing with the Safety Evaluation Report, and  
16 some dealing with the Environmental Impact Statement.

17 We then received 200 pages of sworn  
18 testimony from a total of 22 witnesses, and associated  
19 exhibits. So I should make clear that the Board has  
20 read and carefully studied the materials that the  
21 parties have submitted. And really, that will  
22 constitute much of the evidence that we will consider  
23 in our decision.

24 The main purpose of the evidentiary  
25 hearing today is to allow the Board to question in

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1 person witnesses who have already submitted sworn,  
2 pre-filed written testimony.

3 So, for those of you in the audience,  
4 which I assume means almost everyone, who has not read  
5 the pre-filed testimony, some of this may be a little  
6 difficult to follow. But just be advised that a lot  
7 has happened before we got to this stage.

8 Let's talk a little bit about exhibits  
9 first. Unless there's an objection from either party  
10 the Board plans to admit into evidence the recent  
11 version of all the exhibits that either party has  
12 submitted.

13 This does not mean that the Board  
14 necessarily thinks that every single exhibit is  
15 relevant or persuasive, or that it would necessarily  
16 be admissible in a court of law. For example, some of  
17 the written testimony that was filed deals with a non-  
18 lawyer's conclusions about what NRC regulations  
19 require, or what statutes require.

20 That may be somewhat helpful. But  
21 ultimately, of course, subject to Commission review,  
22 it's this Board's responsibility to decide what the  
23 regulations require, and what the law is. But  
24 nonetheless, we take that for what it's worth.

25 So what it does mean is that in the

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1 absence of any objection, the Board in this  
2 uncontested hearing sees no utility in quibbling about  
3 the technical admissibility of each individual  
4 exhibit. So that said, it's our present intention to  
5 admit into evidence the following exhibits that have  
6 all been previously filed and marked.

7 For PSEG we have PSEG 001-PSEG 017  
8 inclusive. And I should note that PSEG 004 consists  
9 of 29 parts. PSEG 4A through PSEG 4Z, as in Zulu,  
10 inclusive, plus PSEG 4AA, PSEG 4AB, as in alpha bravo,  
11 PSEG 4AC, as in alpha Charlie.

12 On the NRC side we have NRC 001R through  
13 NRC 019, inclusive. And again, I should note that NRC  
14 004 consists of three parts, NRC 4A, NRC 4B as in  
15 bravo, NRC 4C as in Charlie.

16 And also, the NRC has submitted four  
17 revised exhibits that replace original exhibits with  
18 the same numbers. And that would be NRC 1R, NRC 6R,  
19 NRC 8R, and NRC 10R. Did I get that right for  
20 everyone?

21 MR. ROACH: Yes.

22 (Whereupon, the documents referred to were  
23 marked as PSEG Exhibit 001 through 017 and NRC Exhibit  
24 001R through 019 for identification.)

25 CHAIR RYERSON: Okay. Are there any

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1 objections from either side to admitting those  
2 exhibits?

3 MR. BURDICK: No objections.

4 MR. ROACH: No.

5 CHAIR RYERSON: All right. They're all  
6 admitted into evidence.

7 (Whereupon, the documents previously  
8 marked as PSEG Exhibit 001 through 017 and NRC Exhibit  
9 001R through 019 for identification were received into  
10 evidence.)

11 CHAIR RYERSON: Let's address the  
12 treatment of witnesses for just a moment. The Board  
13 will not have oral questions on all topics on which we  
14 have received pre-filed written testimony. We have  
15 previously advised the parties of five of those  
16 topics.

17 And as we prepared for the hearing  
18 yesterday and this morning, there really appears we do  
19 not have oral questions on one further topic, a sixth  
20 topic, which is, has been identified as FEIS-6. It's  
21 an environment issue which concerns the requirements  
22 of other non NRC permits.

23 So any potential witnesses who are here  
24 solely to address that topic, FEIS-6, and for no other  
25 reason, are free to leave if you choose to. You're

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1 also obviously welcome to stay.

2 To simplify things, I think what, how  
3 we'll proceed is, after we hear opening statements  
4 from the parties' counsel, we will swear at one time  
5 all of the witnesses who might be testifying today.  
6 And then when individual witnesses come up we will  
7 simply identify them, as them to identify their full  
8 name, and remind them that they are under oath, so we  
9 don't have to keep swearing people again and again.

10 Finally, logistics. Our expectation is  
11 that we'll try to take a break at convenient times,  
12 maybe roughly every hour, certainly no more than 90  
13 minutes. If there is a chance that we might really  
14 finish before say 1 o'clock, we would be inclined to  
15 just go through and do that, and have lunch after the  
16 proceeding.

17 If it appears we aren't going to do that,  
18 we'll take a hour or so for lunch at 12:00 p.m., 12:30  
19 p.m., again, whatever point seems to make the most  
20 sense. Before we hear opening statements, any  
21 questions or comments from the parties?

22 MR. BURDICK: Nothing from PSEG.

23 MR. ROACH: Just one comment, Judge  
24 Ryerson. For the logistics of the witnesses we, in  
25 our observation we note that it might be efficient for

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1 some topics for there to be more than one witness up  
2 there at the same time.

3 Like, just for example, the hydrologic  
4 modeling topic. We note it can be kind of difficult  
5 to divide between the storm surge and the riverine  
6 flooding. And those witnesses are kind of, work  
7 together on those. And so, it's up to the Board. But  
8 it's simply something that we note may provide for  
9 more efficiency.

10 CHAIR RYERSON: Yes. I think we'll try to  
11 be flexible on that. And the various judges, as we  
12 ask questions may have individual preferences. I  
13 think there are four chairs, three or four chairs,  
14 four chairs in the witness box there.

15 I see we have an empty table. So it's  
16 possible we could actually put some people there too.  
17 Or at least let someone stay there if they're going to  
18 be popping in and out of the witness box. But let's  
19 see how that goes.

20 I know my own questions are focused on  
21 particular individuals. But again, this is a fairly  
22 flexible proceeding. Any comments from my fellow  
23 judges? Judge Arnold?

24 All right. We have previously agreed that  
25 counsel will have opening statements not to exceed 15

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1 minutes. And I suggest we proceed, unless you prefer  
2 otherwise, with PSEG. Mr. Burdick.

3 MR. BURDICK: Thank you, Your Honor. Good  
4 morning again. PSEG is pleased to be here at this  
5 uncontested mandatory hearing required by Atomic  
6 Energy Act Section 189(a), for PSEG's Early Site  
7 Permit, or ESP Application.

8 Let me first review just some brief  
9 background information about PSEG's ESP project. PSEG  
10 submitted its application for ESP to the NRC on May  
11 25th, 2010, so almost six years ago. It submitted the  
12 application under the NRC's regulations in 10 CFR Part  
13 52, Subpart A.

14 This process is well understood. The NRC  
15 has reviewed and approved four earlier Early Site  
16 Permits for the Clinton, Grand Gulf, North Anna, and  
17 Vogtle sites.

18 The ESP would have a duration of 20 years,  
19 and would provide early resolution of site safety,  
20 environmental, and emergency planning issues for one  
21 or two additional reactors at the existing PSEG site.  
22 PSEG has not sought any limited work authorization as  
23 part of its application. And so, the ESP would not  
24 authorize any construction of a reactor.

25 I'd like to try to better illustrate the

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1 site. If we could please pull up Exhibit PSEG 017?  
2 This exhibit consists of four figures from the  
3 Environment Report. On this first slide, this is  
4 Environmental Report Figure 2.1-1.

5 In the center of this figure, in a small  
6 circle, that is the location of the existing PSEG  
7 site, and where the new plant would be located.  
8 There's also a larger circle around this figure that  
9 represents a 50 mile radius around the site.

10 As shown on this figure, the PSEG site is  
11 located on the east bank of the Delaware River, on  
12 Artificial Island, in Lower Alloways Creek Township,  
13 in Salem County, New Jersey. And the site is located  
14 approximately 30 miles southwest of Philadelphia.

15 Turn to the next slide, please. This is  
16 Environmental Report Figure 3.1-1. It's a photograph  
17 of the existing site, looking from the southwest  
18 towards the northeast of the plant. In the foreground  
19 is the Delaware River.

20 And then, as labeled on the figure, to the  
21 right is Salem Units 1 and 2, Hope Creek is towards  
22 the center, and then immediately behind the Hope Creek  
23 unit is the Hope Creek cooling tower.

24 If we could turn to the third slide? This  
25 is Environmental Report Figure 2.1-3. This is another

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1 photograph of the existing site, but looking from a  
2 different perspective. Again the Delaware River is in  
3 the foreground. And this photograph is taken from the  
4 west, looking to the east. And so, north is to the  
5 left on the figure.

6 Here again it shows the existing facility,  
7 with the Salem Units 1 and 2 to the far right on the  
8 figure. To the left of them is Hope Creek. And to  
9 the left of that is the Hope Creek cooling tower.

10 I wanted to provide this perspective,  
11 because just to the left of the cooling tower is where  
12 the new plant would be located under the Early Site  
13 Permit.

14 If we can turn to Slide 4, please? This  
15 is Environmental Report Figure 3.1-2. This is the  
16 Site Utilization Plan for the new plant. To the left  
17 you can see a label with the Delaware River.

18 And I don't expect anyone to read the  
19 remainder of words on this figure. But I wanted to  
20 provide some perspective between the existing units  
21 and where the new units will be located.

22 So to the bottom left of the figure, the  
23 black and white schematic is the existing facility.  
24 And you can see circles that represent Salem Units 1  
25 and 2, Hope Creek, and the cooling tower.

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1           Just to the north, or above that area is  
2 a green hash-marked area. That is the location of  
3 the, where the power block would be located for the  
4 new plant. Just above that, in the blue-ish, purple  
5 hash-marks, that's where the cooling towers for the  
6 new units would be located.

7           There are other colored areas on this  
8 figure. And those represent other areas of the site  
9 that would be effected by construction or operation,  
10 including areas such as the heavy haul road, laydown  
11 areas, the construction parking, and the switchyards.

12           Some of the areas related to construction  
13 would be only temporarily disturbed for the duration  
14 of the construction. That's all for this exhibit.

15           PSEG selected this site for a number of  
16 reasons. Most importantly, their alternative site  
17 selection concluded that no alternative site was  
18 environmentally preferable, or obviously superior to  
19 the PSEG site.

20           There are also benefits to locating the  
21 new plant adjacent to the existing facility. The NRC  
22 already reviewed and approved the site for the  
23 existing Salem and Hope Creek units, which will be  
24 located adjacent to the new units.

25           Because of this there's a wealth of

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1 information demonstrating the acceptability of the  
2 site for an Early Site Permit. There are programs,  
3 procedures, and arrangements that are established and  
4 in place with federal, state and local Government  
5 agencies for the existing units. And these can either  
6 be used or expanded upon for the new units.

7 PSEG has not selected a particular reactor  
8 design to be constructed at the site. Therefore,  
9 PSEG's application is based on a surrogate plant with  
10 a set of bounding parameters. This is referred to as  
11 the plant parameter envelope. This approach has been  
12 used and accepted by the NRC in three prior Early Site  
13 Permits.

14 PSEG's plant parameter envelope is based  
15 on four options. The first is a single unit US  
16 Evolutionary Power Reactor, or EPR. The second is a  
17 single unit Advanced Boiling Water Reactor, or US-  
18 ABWR. The third is a single unit, US Advanced  
19 Pressurized Water Reactor, or US-APWR. And finally,  
20 the fourth option is a dual unit Advanced Passive  
21 1000, or AP-1000.

22 The application was prepared in accordance  
23 with governing statutes, as well as relevant NRC  
24 guidance and regulations. This included the safety  
25 acceptance criteria in the NRC Standard Review Plan,

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1 in NUREG-0800, and the environmental acceptance  
2 criteria in the NRC's Environmental Standard Review  
3 Plan in NUREG-1555.

4 In my remaining time I would like to  
5 address just two additional topics. First, I'd like  
6 to illustrate the extensive review and consideration  
7 undertaken so far for this ESP application. And then  
8 second, I'd like to briefly discuss the findings that  
9 must be made to issue the Early Site Permit.

10 Turning to the first topic, PSEG prepared  
11 and submitted a detailed application that addresses  
12 the full scope of administrative, environmental, and  
13 safety issues for an application of this type. The  
14 application is about 4,000 pages long, and represents  
15 tens of thousands of hours of work.

16 Over the course of almost six years the  
17 NRC staff's conducted a thorough and probing review of  
18 the application. And that's indicated by a number of  
19 activities. The staff has completed site audits.  
20 They've issued numerous requests for additional  
21 information on a wide scope of safety environmental  
22 topics.

23 The staff has held extensive meetings with  
24 PSEG, both prior to the submission, and during the  
25 review of the ESP application. The staff has held

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1 numerous public meetings, both in Delaware and New  
2 Jersey, including those related to environmental  
3 scoping, and to receive comments on the draft  
4 Environmental Impact Statement.

5 The staff has consulted with many federal,  
6 state, and local agencies, and has prepared lengthy  
7 and detailed review documents. The Safety Evaluation  
8 Report is nearly 700 pages. And the Environmental  
9 Impact Statement is almost 2,000 pages long.

10 Beyond the staff's review the Advisory  
11 Committee on Reactor Safeguards, or ACRS, has held  
12 multiple meetings with PSEG and the staff to review  
13 the application and the Safety Evaluation Report.

14 The ACRS concluded on June 25th, 2015 that  
15 the ESP should be issued. This Board also has issued  
16 and received responses to 90 questions and topics  
17 related to the NRC staff's review documents. And has  
18 requested and received testimony on 13 topics.

19 This has resulted in hundreds of pages of  
20 filings by the parties, as well as thousands of pages  
21 of exhibits. All of these activities have resulted in  
22 an extensive and thorough review of the application.

23 Turning to the second topic, the Licensing  
24 Board and the parties have agreed upon the specific  
25 findings that must be made to issue the ESP. Those

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1 findings are set out in 10 CFR 52.24(a) for the safety  
2 findings, and 10 CFR 51.105(a) for the environmental  
3 findings.

4 And they are also identified in Attachment  
5 A to the Board's initial scheduling order, and are  
6 discussed in some detail in both PSEG's and the NRC  
7 staff's written testimony on SER Topic 1.

8 As demonstrated in that testimony, the ESP  
9 application and the NRC staff's documents fully  
10 support all the findings that must be made to issue  
11 the requested ESP for the PSEG site.

12 Turning briefly to the safety findings,  
13 first, the application meets the applicable standards  
14 and requirements of the Atomic Energy Act and the NRC  
15 regulations. The application was prepared to  
16 specifically address those requirements, and has  
17 undergone an extensive review.

18 Second, any required notifications have  
19 been made. Given the scope of the application those  
20 notifications primarily relate to the environmental  
21 review.

22 Third, there is reasonable assurance that  
23 the PSEG site is in conformity with the requirements  
24 of the Atomic Energy Act and the NRC regulations.  
25 This also has been extensively reviewed.

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1 Fourth, the applicants are certainly  
2 technically qualified to engage in any activities to  
3 be authorized by the Early Site Permit. They  
4 currently own and operate other nuclear power  
5 reactors.

6 Fifth, the application proposes  
7 inspections, tests, analyses, and acceptance criteria  
8 that are both necessary and sufficient.

9 And finally, issuance of the permit will  
10 not be inimical to the common defense and security, or  
11 to the health and safety of the public. The site  
12 itself has been extensively reviewed. And the  
13 applicants are U.S. companies that already own and  
14 operate other nuclear power reactors.

15 Now, turning to the environmental  
16 findings. First, the requirements of the National  
17 Environmental Policy Act, or NEPA, and the NRC  
18 regulations at 10 CFR Part 51 have been satisfied.

19 For example, the review utilized the  
20 systematic inter-disciplinary approach. Additionally,  
21 the review considered and documented environmental  
22 impacts, any effects which cannot be avoided,  
23 alternatives, the relationship between local short  
24 term uses and long term productivity, and any  
25 irreversible and irretrievable commitments.

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1           Second, the many benefits of the project  
2 outweigh the costs. Some of those benefits include  
3 carbon free electricity generation, jobs, tax revenue,  
4 and infrastructure. Those benefits outweigh the  
5 relatively minor environmental impacts of the project.

6           Third, alternatives have been adequately  
7 considered. And finally, for the many reasons I  
8 already discussed, the NEPA review conducted by the  
9 staff has been adequate. It has been extensive and  
10 consistent with relevant NRC regulations and guidance.

11           In summary, the robust review conducted by  
12 the NRC staff has satisfied all applicable  
13 requirements. The Application, the Safety Evaluation  
14 Report, and Environmental Impact Statement contain  
15 sufficient information to support the conclusions that  
16 the Board is required to make as part of this  
17 mandatory hearing.

18           The PSEG site is capable of supporting the  
19 construction and operation of new nuclear units, with  
20 design parameters falling within those specified in  
21 the PSEG plant parameter envelope. The extensive  
22 testimony and exhibits that are part of this mandatory  
23 hearing support an affirmative decision on the PSEG  
24 application.

25           And finally, the requested ESP should be

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1 issued subject to the terms and conditions identified  
2 by the NRC staff. Thank you. And we look forward to  
3 responding to the Board's questions today.

4 CHAIR RYERSON: Thank you, Mr. Burdick.  
5 Mr. Roach, are you doing the opening for the NRC  
6 staff?

7 MR. ROACH: Yes, Judge Ryerson. Good  
8 morning Your Honors. And welcome to members of the  
9 public. Thank you for the opportunity to make this  
10 opening statement. My colleague Ann Hove and I are  
11 counsel for the NRC staff. And we and the NRC staff  
12 witnesses are pleased to be here today for this  
13 uncontested hearing.

14 At the conclusion of this hearing we  
15 submit that the Board will be able to find that the  
16 staff's safety and environmental reviews addressing  
17 the PSEG Early Site Permit Application have been  
18 adequate, and complied with all applicable NRC  
19 regulations.

20 As I will summarize, the NRC staff has  
21 performed a thorough review, covering many safety and  
22 environmental subject areas. In doing so the staff  
23 followed all applicable NRC staff guidance, evaluated  
24 the ESP Application in a manner consistent with the  
25 reviews of previous ESP Applications, and incorporated

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1 lessons learned from previous new reactor reviews.

2 The staff's safety review encompassed the  
3 PSEG site's meteorology, hydrology, geology and  
4 seismology, as well as the potential hazards to a  
5 nuclear plant that could result from manmade  
6 facilities and activities on or in the vicinity of the  
7 site.

8 The staff also assessed the risks of  
9 potential accidents that could occur as the result of  
10 the operation of a nuclear plant at the site, and  
11 evaluated whether the site would support adequate  
12 physical security measures for a nuclear power plant.

13 The staff evaluated the applicant's  
14 quality assurance measures, and the complete and  
15 integrated emergency plans that the applicant would  
16 implement if a new nuclear unit or units are  
17 eventually constructed at the PSEG site.

18 The staff also considered the Fukushima  
19 Near Term Task Force recommendations applicable to the  
20 PSEG ESP review.

21 For its safety evaluation the staff  
22 reviewed the information presented in the PSEG ESP  
23 Application, and requested additional information  
24 where appropriate, to ensure that the application  
25 included the necessary information to support the

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1 staff's safety findings.

2 For context, the staff issued  
3 approximately 75 information requests, containing more  
4 than 200 questions in total. The staff concluded that  
5 the application met the safety requirements for  
6 issuance of an ESP in all respects.

7 The staff's Environmental Review, as  
8 documented in the Final Environmental Impact  
9 Statement, or FEIS, was completed with the US Army  
10 Corps of Engineers as a cooperating agency, and as a  
11 member of the environmental review team.

12 The review team consisted of over 40  
13 subject matter experts, who used a comprehensive and  
14 inter-disciplinary approach to environmental impact  
15 assessment.

16 The FEIS focuses on the direct, indirect,  
17 and cumulative environmental effects of construction,  
18 and operation of a plant, that the parameters  
19 identified in the parameter envelope at the PSEG site.

20 The staff analyzed environmental impacts  
21 related to land use, water, meteorology and air  
22 quality, terrestrial and aquatic ecology, socio  
23 economics and environmental justice, historic and  
24 cultural resources, radiological and non-radiological  
25 health, and fuel cycle transportation and

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1 decommissioning.

2           The FEIS also includes a discussion of the  
3 staff's assessment of the need for power in the market  
4 area, which operation of a plant would partially  
5 address.

6           The staff evaluated alternative sites to  
7 determine whether there is an obviously superior  
8 alternative to the proposed site. The staff also  
9 evaluated alternative energy sources, alternative  
10 system designs, and the no action alternative.

11           After considering the environmental  
12 impacts, the NRC staff concluded in the FEIS that no  
13 alternative site is obviously superior to the proposed  
14 site. And recommended that the NRC should issue the  
15 ESP.

16           The staff has included as Exhibit NRC 005  
17 a draft summary record of decision in furtherance of  
18 satisfying the requirements of 10 CFR 51.102 and  
19 51.103.

20           This document pertains only to findings  
21 required by NEPA in Part 51, and does not substitute  
22 for any findings made by the Board. It is rather  
23 intended to be a parallel document to a Board decision  
24 that would constitute the record of decision in this  
25 proceeding.

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1           Following the issuance of a Board  
2 decision, the NRC staff would update the summary  
3 record of decision to ensure that its contents conform  
4 to the Board's environmental findings under Part 51.  
5 The summary record of decision will be issued to the  
6 public after it is finalized.

7           As the Commission has directed, when  
8 conducting an uncontested hearing the Board should  
9 conduct a sufficiency review, rather than a de novo  
10 review. In other words, the Board should inquire as  
11 to whether the NRC staff performed an adequate review,  
12 and made findings with reasonable support in logic and  
13 fact.

14           The staff submits that its final SER and  
15 the EIS provide the necessary basis for the Board to  
16 make all the findings required by the Commission. The  
17 staff also submits that its responses to Board  
18 questions and pre-filed written testimony are  
19 consistent with the final SER and EIS, and support the  
20 necessary findings the Board must make.

21           Finally, the NRC staff witnesses that are  
22 present today will provide testimony on the specific  
23 areas identified by the Board. And this testimony  
24 will also highlight the sufficiency of the NRC staff  
25 review. Thank you.

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1 CHAIR RYERSON: Thank you, Mr. Roach. I  
2 do have one question for you, again, to clarify as to  
3 the meaning of, the record of decision I think you  
4 introduced as NRC 005, which we've admitted in its  
5 present form as evidence.

6 Is it your, is it the staff's hope and  
7 expectation that the Board will, for want of a better  
8 word, bless that in some way? Or is it the staff  
9 expectations that the staff will then go rework that  
10 in view of the Board's final determination?

11 MR. ROACH: It's the latter, Judge  
12 Ryerson. But we simply wanted to provide the Board  
13 with a picture of what the staff was kind of planning  
14 to do format-wise.

15 CHAIR RYERSON: Okay. So we will be  
16 producing our own decision, the Board's own decision.  
17 And then the staff will, if necessary, modify 004, the  
18 record of decision, to be consistent with the Board's  
19 decision. That's your hope and expectation?

20 MR. ROACH: Yes. That is correct.

21 CHAIR RYERSON: If modification is  
22 necessary?

23 MR. ROACH: Correct, yes.

24 CHAIR RYERSON: All right. Okay. Thank  
25 you. Very good. Well, why don't we swear all the

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1 potential witnesses. And I urge, don't feel badly if  
2 you end up not testifying for some reason. But we  
3 might as well, for mechanical purposes, swear everyone  
4 who thinks they possibly might testify.

5 And then we will individually identify  
6 you, and remind you you're sworn, when you come  
7 forward. So, if I could ask everyone who is  
8 potentially a witness to please stand?

9 MR. BURDICK: Judge Ryerson?

10 CHAIR RYERSON: Yes.

11 MR. BURDICK: Just to be clear, for PSEG  
12 we had identified only two witnesses --

13 CHAIR RYERSON: Right.

14 MR. BURDICK: -- that submitted written  
15 testimony. We also have eight other individuals who  
16 are here just in case the Board's question. Would you  
17 like to swear them in as well, or just --

18 CHAIR RYERSON: They certainly --

19 MR. BURDICK: -- the two individuals?

20 CHAIR RYERSON: There's no harm in being  
21 sworn.

22 MR. BURDICK: Okay.

23 CHAIR RYERSON: Nothing bad happens to  
24 you, as long as you don't say anything. If I could  
25 ask you to raise your right hand, please?

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1 (Witnesses sworn)

2 CHAIR RYERSON: So, we are ready to begin  
3 with topic, the first safety related topic, SER-1,  
4 which deals with the specific safety related findings  
5 that the Board must make to authorize an ESP. And  
6 specifically how those findings are supported by the  
7 staff's review.

8 And so, we'll begin that questioning with  
9 Judge White. I'm sorry, with Judge Arnold. And,  
10 Judge Arnold, how would you like, how many witnesses  
11 would you like to come up to start on that, up here?

12 ADMIN. JUDGE ARNOLD: I think the only  
13 questions I have for the staff are for Mr. Chowdhury.  
14 WHEREUPON,

15 PROSANTA CHOWDHURY  
16 was called as a witness and, having been first duly  
17 sworn, was examined and testified as follows:

18 CHAIR RYERSON: Welcome, Mr. Chowdhury.  
19 Before Judge White asks you questions, if you would  
20 state your full name for the record?

21 WITNESS CHOWDHURY: My name is Prosanta  
22 Chowdhury. And I'm the NRC project manager.

23 CHAIR RYERSON: And I remind you that  
24 you're under oath.

25 WITNESS CHOWDHURY: I am under oath.

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1 ADMIN. JUDGE ARNOLD: Let's see, the Early  
2 Site Permit safety review and environmental reviews  
3 made use of an envelope of plant parameters, based  
4 upon the collection of possible reactor designs.

5 Now, if there were a significant delay  
6 between the issuance of the Early Site Permit and  
7 applying for a COL, it's possible that other designs  
8 might be developed. If a new plant design was found  
9 to be within the envelope of plant parameters used,  
10 would this Early Site Permit be considered valid for  
11 that design?

12 WITNESS CHOWDHURY: This Early Site  
13 Permit, Your Honor, used this parameter envelope that  
14 was submitted, and that staff reviewed. So any other  
15 design, as the applicant also committed, chosen  
16 outside of the selected designs that falls outside of  
17 the plant parameter envelope, then this will be a  
18 deviation from the permit itself.

19 ADMIN. JUDGE ARNOLD: But if it fell  
20 within the envelope, it would be --

21 WITNESS CHOWDHURY: It will be --

22 ADMIN. JUDGE ARNOLD: -- you know, there  
23 would be some review to make sure of that. But then  
24 --

25 WITNESS CHOWDHURY: It is correct.

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1           ADMIN. JUDGE ARNOLD: And to what extent,  
2 if it fell a little outside the border of the  
3 parameter? Could you still use some of this Early  
4 Site Permit? Or would you be back to starting from  
5 scratch?

6           WITNESS CHOWDHURY: I believe that if  
7 there is a difference between what is in the permit  
8 and what the potential COL Application would have,  
9 then the applicant has the option to request for a  
10 variance. So the staff in that case will look at the  
11 variance, and also compare it with the approved Early  
12 Site Permit.

13          ADMIN. JUDGE ARNOLD: Okay. But it  
14 wouldn't be back to scratch, and another five years of  
15 environmental review?

16          WITNESS CHOWDHURY: To the extent it is  
17 not necessary, it will not be.

18          ADMIN. JUDGE ARNOLD: Okay. In Answer 4  
19 of your testimony on SER-1 you said applicant,  
20 applicable standards and requirements of the Atomic  
21 Energy Act, and the Commission's regulations. You  
22 said that the application met all those. Is there  
23 somewhere a single guidance document that lists all of  
24 those requirements and standards?

25          WITNESS CHOWDHURY: The Agency's Standard

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1 Review Plan, which is NUREG 0800 guides the staff to  
2 review the applicable regulations. And then to make  
3 sure that the applicant's information meet those  
4 regulations.

5 The answer is yes. The guide have, the  
6 staff utilizes a step by step guidance that addresses  
7 all of these applicable regulations for a certain type  
8 of application, in this case the PSEG site ESP  
9 Application.

10 ADMIN. JUDGE ARNOLD: In your answer to  
11 Question 7 of your written testimony, you list  
12 notifications you made for the environmental review.  
13 How do you ensure the completeness of those  
14 notifications?

15 WITNESS CHOWDHURY: Your Honor, that  
16 response was provided by our environmental project  
17 manager, Mr. Allen Fetter, who is present, and sworn  
18 in as to testimony.

19 I would say that the environmental  
20 notification, or notifications related to the  
21 environmental review have been made consistent with  
22 the environmental review guidance, and any other  
23 guidance and requirements of the Agency to do so. So,  
24 Mr. Fetter can elaborate on that. I should say Dr.  
25 Fetter, Dr. Allen Fetter.

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1 CHAIR RYERSON: And again, if you would  
2 state your full name, please. And I remind you,  
3 you're under oath.

4 WHEREUPON,

5 ALLEN FETTER

6 was called as a witness and, having been first duly  
7 sworn, was examined and testified as follows:

8 WITNESS FETTER: Yes. Allen Fetter. And  
9 I'm under oath. Yes. Your question regarding the  
10 notifications we made. We have Federal Register  
11 notices, which can be found in the Federal Register.

12 We also work through the Office of Public  
13 Affairs for press releases, which can be found on our  
14 website. And notifications of public meetings were  
15 also done through newspapers. And we have those tear  
16 off sheets if you, the Board would like to have  
17 evidence of those as well.

18 ADMIN. JUDGE ARNOLD: I'm just trying to  
19 find out if there's a systematic way of ensuring  
20 everyone that's supposed to be notified has been  
21 notified.

22 WITNESS FETTER: I, we make, we're  
23 required to make notification to the public. For  
24 example, EPA we have to submit the draft EIS to them.  
25 We also have to, we have a systematic way that we

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1 notify the public regarding our application review  
2 process and the documents, public participation  
3 activities.

4 ADMIN. JUDGE ARNOLD: Okay.

5 WITNESS FETTER: And we have, in terms of  
6 -- Is that what you're getting at? Or is this --

7 ADMIN. JUDGE ARNOLD: Well, I'm thinking,  
8 you know, you've got historic societies and, you know  
9 --

10 WITNESS FETTER: Oh, okay. Well, as part  
11 of, we also do site audits. And our environmental  
12 review staff also have, meet with state and local  
13 officials, and the national or the state historic  
14 preservation office and, you know, departments of  
15 environmental quality, to make sure that we do proper  
16 outreach. It's part of our practices.

17 ADMIN. JUDGE ARNOLD: Okay. Thank you.

18 MR. ROACH: And, Judge Arnold, I might  
19 just also add that the regulations that the staff  
20 noted in its testimony identify specific entities that  
21 must be notified as well. So it plays out the scoping  
22 process. And through the scoping process the staff  
23 identifies further interested stakeholders to  
24 identify.

25 ADMIN. JUDGE ARNOLD: Okay. I believe I'm

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1 going back to Mr. Chowdhury here. Let's see. In  
2 answer to Question 8 of the testimony you state, the  
3 staff conducted the safety review of the PSEG site ESP  
4 application against the applicable regulations in  
5 Title 10 of the Code of Federal Regulations, Part 20,  
6 50, 52, 73 and 100.

7 Now, I did a quick review of 73, and found  
8 no obvious requirements for an Early Site Permit. But  
9 I did see in 52.17 saying that each applicant for an  
10 Early Site Permit under this part shall protect  
11 Safeguards information against unauthorized  
12 disclosure, in accordance with the requirements of  
13 73.21 and 73.22 of this chapter. Is that all of 10  
14 CFR 73 that is applicable to an early site permit?

15 WITNESS CHOWDHURY: Yes, Your Honor. We  
16 did not want to miss including any regulation that the  
17 staff have to look at, to ensure that we have covered  
18 that regulation. That's the only part of Part 73 that  
19 was in Chapter 13.6 physical security the staff has  
20 used, utilized.

21 ADMIN. JUDGE ARNOLD: And was there any  
22 Safeguards information in the application?

23 WITNESS CHOWDHURY: No, Your Honor. The  
24 Safeguards information is not as part of the ESP  
25 Application.

1 ADMIN. JUDGE ARNOLD: And, pretty much,  
2 was there anything from 10 CFR 20 that you found to be  
3 applicable for the Early Site Permit?

4 WITNESS CHOWDHURY: I believe in Chapter  
5 11, specifically in this case Chapter, Section 11,  
6 Sections 11.2 and 11.3 touch upon the Chapter 20, some  
7 of the Chapter 20 requirements.

8 ADMIN. JUDGE ARNOLD: I'm going to get  
9 into the questioning of inimical. And pardon me,  
10 because my mouth has a hard time wrapping around that  
11 word. So I might mispronounce it a time or two.

12 In the answer to Question 11 you state  
13 that the staff found that issuance of a permit to the  
14 applicant will not be inimical to the common defense  
15 and security, or to the health and safety of the  
16 public.

17 Now, when you make this finding, is it  
18 only saying that the issuance of the permit would not  
19 be inimical? Or are you looking at, this permit and  
20 a possible plant being on site at some time in the  
21 future?

22 WITNESS CHOWDHURY: We are issuing the  
23 permit for the site to be suitable for future  
24 construction and operation of one or two nuclear  
25 units. So, this relates to the site itself. Because

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1 there will be future additional review in the  
2 subsequent licensing process, and more detail.

3 ADMIN. JUDGE ARNOLD: Now, when you say  
4 it's not inimical to the common defense, what do you  
5 mean by the common defense?

6 WITNESS CHOWDHURY: Common defense and  
7 security is a requirement of the Atomic Energy Act.  
8 And through, as the Atomic Energy Act requires the  
9 Agency to implement and to promote that common defense  
10 and security.

11 The Agency developed its regulations to  
12 regulate civil use of nuclear materials and sources.  
13 And in doing so, all the regulatory requirements, all  
14 the regulations in place that are applicable to this  
15 ESP Application.

16 The staff verifies and reviews the  
17 application against those regulations, and find if all  
18 the regulatory requirements are met. Then they  
19 provide the staff's determination conclusion that the  
20 site has been, or is indeed not inimical to the health  
21 and safety of the public, and common defense of, and  
22 security as defined by the Atomic Energy Act.

23 ADMIN. JUDGE ARNOLD: Can you think of any  
24 way that issuing an Early Site Permit could threaten  
25 the common defense? I can't imagine it. But --

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1 WITNESS CHOWDHURY: Can you please repeat  
2 your question?

3 ADMIN. JUDGE ARNOLD: Is, I'm trying to  
4 imagine some way that an issuance of an Early Site  
5 Permit could be a threat to the common defense. And  
6 I'm coming up with a blank. So it sounds to me like  
7 an easy finding to make on your part.

8 WITNESS CHOWDHURY: I don't want to come  
9 up with any generic response. Because I really can't  
10 think of any at this point. However, specific to this  
11 application, there was none that we could come up with  
12 or we could think of, beyond, and above and beyond the  
13 scope of the review and the regulatory requirements.

14 ADMIN. JUDGE ARNOLD: Okay. You also  
15 found, which is not inimical to security. And what do  
16 you mean by security there?

17 WITNESS CHOWDHURY: This is the, broadly  
18 speaking, the security of the country itself.

19 ADMIN. JUDGE ARNOLD: Okay. Okay.  
20 Inimical to the health or safety of the public. Now,  
21 since the early, since an Early Site Permit really  
22 doesn't authorize them to do anything in the way of  
23 construction or operation, how would the issuance of  
24 an Early Site Permit be inimical to either health or  
25 safety of the public?

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1                   WITNESS CHOWDHURY: The staff does need to  
2 look at, for example, gaseous and liquid effluent  
3 releases from routine operation, the aspects of  
4 Chapter 11, which is specifically 11.2 and 11.3. The  
5 staff looks at that. The staff looks at the  
6 meteorology. The staff looks at the emergency  
7 planning aspects of the application.

8                   So, in doing all of this in aggregate, the  
9 staff comes up with the conclusion that the findings  
10 from these areas are satisfactory, and within the  
11 requirements of the application that has to do, in  
12 some respect, the health and safety of the public.

13                  ADMIN. JUDGE ARNOLD: And when you make  
14 this determination, do -- I broke it down into the  
15 four categories. Do you consider those four  
16 categories separately? Or is this more like a  
17 general, you look at, in the aggregate, what's common  
18 defense, security, health, and safety?

19                  WITNESS CHOWDHURY: It depends on how the  
20 guidance document guides the staff. I'll give an  
21 example. In reviews, review of certain sections of  
22 the standard application there is what is called  
23 interface between reviewers and review sections. So,  
24 where necessary, the staff interfaces with each other.

25                  One example is, the staff interfaces, the

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1 site hazards reviewers interface with emergency  
2 planning. The Chapter 11 folks interface to some  
3 extent with the meteorology. So, if you look at it  
4 broadly, yes, it is a comprehensive conclusion.

5 ADMIN. JUDGE ARNOLD: Okay. And should  
6 there be a COL or construction permit application in  
7 the future, this will be, there will be another  
8 finding for that application?

9 WITNESS CHOWDHURY: To the extent that  
10 this Early Site Permit does not cover there will be  
11 other findings.

12 ADMIN. JUDGE ARNOLD: Okay. That's all of  
13 my questions for staff, unless there's anything else  
14 you think that's important. No? Great. I'm done  
15 with you. But I would like to --

16 CHAIR RYERSON: Actually, Judge White, did  
17 you have questions?

18 ADMIN. JUDGE WHITE: No, I have no  
19 questions on this topic. Thanks.

20 CHAIR RYERSON: All right. Thank you.  
21 We'll probably see more of you, I suspect. Let's see,  
22 the PSEG -- shall we have both PSEG witnesses come up,  
23 since there are only two. And if I could ask you each  
24 to identify yourselves, your full name.

25 WHEREUPON,

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JAMIE MALLON

was called as a witness and, having been first duly sworn, was examined and testified as follows:

WITNESS MALLON: Good morning. My name is Jamie Mallon. And I'm the project manager for PSEG.

CHAIR RYERSON: Welcome.

WHEREUPON,

DAVID ROBBILLARD

was called as a witness and, having been first duly sworn, was examined and testified as follows:

WITNESS ROBBILLARD: Good morning. My name is David Robbillard. I'm the licensing lead for the Early Site Permit project. And I am under oath.

CHAIR RYERSON: Thank you. And again, I remind each of you that you're under oath. Judge White or Judge Arnold.

ADMIN. JUDGE ARNOLD: Okay. In Question 4 of your testimony you state, we have considered all of the safety environmental findings that must be made to issue the ESP. How, what process did you use to ensure that you in fact considered all of the requirements?

WITNESS ROBBILLARD: I'll respond to that, Dave Robbillard. The process is by review of the NRC standard review plans for both the safety evaluation

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1 and the environmental impact evaluation. In our  
2 application we confirmed that we comply with all of  
3 those applicable standards.

4 ADMIN. JUDGE ARNOLD: In general do you  
5 find it easy to navigate the NRC regulations, to  
6 ensure that you've complied with everything?

7 WITNESS ROBBILLARD: It can be challenging  
8 at times, Your Honor. But I think we got through it  
9 pretty well.

10 ADMIN. JUDGE ARNOLD: And, let's see, in  
11 Question 18 you include in your list of all relevant  
12 regulations both in CFR 20 and 73. To what extent did  
13 you find that your application addressed those two  
14 parts?

15 WITNESS ROBBILLARD: Your Honor, Part 20,  
16 as Mr. Chowdhury relayed, requires an applicant for an  
17 Early Site Permit to evaluate both normal operation  
18 and accident doses to the general public. That would  
19 be where Part 20 applies.

20 In Part 73, as he said, it is applicable  
21 to any security related information that could be  
22 included in the Early Site Permit. Our application  
23 did not include any security or Safeguards information  
24 that would need to be withheld.

25 ADMIN. JUDGE ARNOLD: In the Answer 55 of

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1 your testimony you state, "The NRC staff developed  
2 independent reliable information, and conducted a  
3 systematic inter-disciplinary review of the potential  
4 impacts of the proposed action on the environment, and  
5 reasonable alternatives to the proposed action."

6 Now, how did you determine that? Did you  
7 just take the staff's word for it? Or could you  
8 verify what the staff did independently?

9 WITNESS ROBBILLARD: No, Your Honor. As  
10 Dr. Fetter spoke to, the environmental staff conducted  
11 a number of site audits at a number of federal  
12 agencies. Other federal agencies, as well as state  
13 agencies participate in those audits.

14 The staff went into the community and  
15 spoke to pastors of churches, elected officials, other  
16 concerned individuals. The staff conducted their own  
17 need-for-power analysis, beyond our need-for-power  
18 analysis that's presented in Chapter 8 of the  
19 Environmental Report. Those are just a few examples  
20 of their independent reviews.

21 ADMIN. JUDGE ARNOLD: So, would you say  
22 PSEG was involved with these interactions, to an  
23 extent that you're willing to state that the staff did  
24 a thorough review?

25 WITNESS ROBBILLARD: Yes, Your Honor. And

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1 we were involved in, based on their reviews, we  
2 received Requests for Additional Information on our  
3 analyses, and responded to the NRC staff.

4 ADMIN. JUDGE ARNOLD: Thank you. That's  
5 all my questions.

6 CHAIR RYERSON: Judge White, did you have  
7 questions?

8 ADMIN. JUDGE WHITE: Nothing here.

9 CHAIR RYERSON: I think this concludes our  
10 questions then on the first topic, SER-1. It's almost  
11 10 o'clock. I suggest we take a short break, and  
12 resume with the questions on SER-2. So, why don't we  
13 return promptly at 10:05 a.m., take a ten minute  
14 break. Thank you.

15 (Whereupon, the above-entitled matter went  
16 off the record at 9:56 a.m. and resumed at 10:08 a.m.)

17 CHAIR RYERSON: All right. We will be  
18 proceeding, as I said, to the second safety related  
19 issue. Before that, I'd like to remind the witnesses  
20 and counsel, because we often will have multiple  
21 witnesses in the witness box, and then occasionally a  
22 comment from counsel.

23 If you would try to remember to identify  
24 yourself before speaking, so that when the reporter  
25 goes back and looks at the notes it's always easier

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1 that way to identify who is speaking.

2 I think I have the first question on Topic  
3 SER-2, which concerns whether the nine permit  
4 conditions that the staff has proposed are  
5 sufficiently precise to meet the standards the  
6 Commission has imposed on conditions of that nature.

7 And I know my first question, or actually,  
8 possibly my only questions are for Mr. Mallon. So, I  
9 suggest both of the PSEG witnesses come up, and you  
10 can decide who is best equipped to answer. And again,  
11 you are each still under oath.

12 Let me put the question to you, Mr.  
13 Mallon. Your testimony indicated that of the nine  
14 permit conditions posed by the staff, you pointed out  
15 that, I think it's Conditions 3 through 9 each  
16 appeared to mirror, or very closely track permit  
17 conditions that the Commission has approved in other  
18 cases.

19 You didn't say that about Permit Condition  
20 1 or Permit Condition 2. And I wonder whether you  
21 looked for similar conditions in other cases, and were  
22 unable to find them.

23 WITNESS MALLON: Let me, if I can, refer  
24 to the testimony, so that I make sure I know which  
25 ones I'm referring to.

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1 CHAIR RYERSON: Yes. I believe your  
2 testimony ran through each of the nine conditions  
3 individually. And probably near the end of each  
4 discussion on Permit Conditions 3 through 9 you  
5 indicated that there were similar conditions approved  
6 in Commission decisions, but not as to one and two.

7 And that's why I was just wondering  
8 whether you looked for that. And if this is something  
9 that is better answered by counsel, I'll take  
10 counsel's word on that as well.

11 WITNESS MALLON: Okay.

12 WITNESS ROBBILLARD: Your Honor, this is  
13 Dave Robbillard. Conditions, Permit Conditions 1 and  
14 2 are very site specific. Condition 1 deals with our  
15 pursuit of obtaining a land exchange with the Army  
16 Corps of Engineers for approximately 85 acres just  
17 north of the existing Hope Creek site.

18 The other Early Site Permits, if I recall,  
19 their land area was much larger than ours. If you go  
20 to Vogtle, it's a huge site. So they wouldn't need a  
21 land exchange. Their site is large enough where they  
22 would already have control over their exclusionary  
23 boundary. So that one is site specific. So we really  
24 didn't go looking for another similar condition.

25 ADMIN. JUDGE ARNOLD: Okay.

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1 WITNESS ROBBILLARD: Permit Condition 2  
2 has to do with a gasoline tank that may or may not  
3 have to be relocated once we choose our technology.  
4 Again, these other sites are large, and they are  
5 further along.

6 For Vogtle in particular, they had their  
7 technology picked. They knew exactly where those two  
8 units were going to be. They knew what changes they  
9 had to make to the existing site. So they had already  
10 explained that in their application. They didn't need  
11 a Permit Condition for this.

12 ADMIN. JUDGE ARNOLD: So, your response  
13 essentially is that these first two conditions are  
14 very site specific. They deal with the individual  
15 facts of this particular site. And you wouldn't  
16 necessarily expect to find closely analogous  
17 Commission decisions approving.

18 WITNESS ROBBILLARD: This is Dave  
19 Robbillard. Yes, Your Honor.

20 CHAIR RYERSON: Okay. Thank you. I think  
21 that is all I have. If, Judge Arnold, did you want to  
22 --

23 ADMIN. JUDGE ARNOLD: I don't have any  
24 question for PSEG. I have a question for staff  
25 concerning Permit Condition 2. And that I believe was

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1 responded to by Seshagiri Tammara. So --

2 CHAIR RYERSON: Okay. You can step down.  
3 You're excused for the moment. You may be back.

4 WHEREUPON,

5 SESHAGIRI TAMMARA

6 was called as a witness and, having been first duly  
7 sworn, was examined and testified as follows:

8 WITNESS TAMMARA: I am Seshagiri Tammara.

9 CHAIR RYERSON: Thank you.

10 WITNESS TAMMARA: I am --

11 CHAIR RYERSON: You are still under oath.

12 WITNESS TAMMARA: I am under oath.

13 CHAIR RYERSON: Thank you.

14 ADMIN. JUDGE ARNOLD: Under Permit  
15 Condition 2 it requires the applicant perform a  
16 certain calculation to show that the overpressure due  
17 to an explosion at a relocated gasoline storage tank  
18 does not exceed 1 psi at certain locations.

19 Now, I can see that them doing the  
20 calculations, and the calculations coming less than 1  
21 psi, that's just a matter, you know, okay, they've  
22 done it, you can check that off. But that's not the  
23 end of the work, is it, for the NRC staff? That just  
24 kicks off your review, and approval of the  
25 calculation? Is that correct?

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1                   WITNESS TAMMARA:    Yes.    As the Permit  
2                   Condition has prescribed, that the applicant has  
3                   committed to relocate that tank, as that is not  
4                   meeting the regulatory requirement at the present time  
5                   under ESP.

6                   Therefore, they committed that they will  
7                   relocate in the process of COL, after the selection of  
8                   a new technology, or whatever final technology is.  
9                   And also you see associated with the tank, the  
10                  delivery truck routing will also be relocated.

11                  So the prescription is that the analysis  
12                  has to be done in accordance with the prescribed  
13                  guidance, NRC guidance.  And the results should show  
14                  that the overpressure should be within 1 psi for the  
15                  direct explosion, as well as vapor cloud explosion.

16                  So, it is a matter of submitting that  
17                  information for verification, not to draw any  
18                  conclusions or judgments of evaluation.  Not analysis,  
19                  but as a part of ESP, the verification is whether the  
20                  applicant has complied with the prescription of the  
21                  condition.

22                  And the further analysis, if required,  
23                  would be done as per the COL application.  And if  
24                  there is a license condition to be imposed or proposed  
25                  that will be done in that stage.  So here it is just

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1 adhering and addressing, and notifying and documenting  
2 the prescribed condition.

3 ADMIN. JUDGE ARNOLD: Yes. But from the  
4 staff side, the work initiated by that Permit  
5 Condition is not done when you have checked off that  
6 the Permit Condition is not done when you have checked  
7 off that the Permit Condition has been completed.  
8 That's really when you start looking at their  
9 calculations, and decide whether or not it was done  
10 appropriately, correct?

11 WITNESS TAMMARA: Presently we have done.  
12 It doesn't need. Therefore, they have to follow the  
13 same guidance. But whether they have done correctly  
14 or not will be the part of COL review. And they can  
15 further carry out. But the condition itself is, they  
16 have relocated, and they have addressed the issue.  
17 That is the significance of this part.

18 ADMIN. JUDGE ARNOLD: I'm just trying to  
19 understand. It's that, in anything that you want,  
20 might want to require a applicant to do under a Permit  
21 Condition.

22 If you look at it and say, well, that's  
23 not just administrative. It's going to take something  
24 more than that. You can parse them into, you know,  
25 what the staff is going to do after they complete

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1 something that's very --

2 WITNESS TAMMARA: But the --

3 ADMIN. JUDGE ARNOLD: -- ministerial.

4 WITNESS TAMMARA: The Permit Condition is  
5 limited to the ESP, that they have to address, and  
6 they have to follow the guidance prescribed in 1.91  
7 and 1.78. And they have to do the analysis, and show  
8 that the 1 psi overpressure is met at the relocation.

9 So, whether they have done it in correct  
10 fashion or not is, cannot be done under the, in the  
11 Permit Condition preview. So that will be again  
12 looked at in the COL. Because that is a new issue  
13 that has, they have complied with the Permit  
14 Condition.

15 And whether they have done it correctly or  
16 not, if they have not done, they might impose the same  
17 Permit Condition to the License Condition if they have  
18 not done properly. And they will make sure that it  
19 has been done.

20 They have shown here they complied with  
21 the condition. But they have done it correctly or  
22 not, cannot be done over here. But it will be done in  
23 the COL space. That's why --

24 ADMIN. JUDGE ARNOLD: Okay. I just want  
25 to be clear. The completion of the Permit Condition

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1 is not the completion of the work involved with it?

2 WITNESS TAMMARA: That's correct.

3 ADMIN. JUDGE ARNOLD: Okay.

4 WITNESS TAMMARA: Your Honor.

5 ADMIN. JUDGE ARNOLD: Okay. Thank you.

6 That's all I wanted to make sure.

7 WITNESS TAMMARA: Thank you.

8 CHAIR RYERSON: Do you have --

9 ADMIN. JUDGE WHITE: Yes, I --

10 CHAIR RYERSON: For this witness or --

11 ADMIN. JUDGE WHITE: No.

12 CHAIR RYERSON: Okay, no. All right.

13 Judge White then.

14 ADMIN. JUDGE WHITE: Yes. I'd like to  
15 follow up on this. I had some questions regarding  
16 this issue, as it pertains to Permit Condition 3. And  
17 staff witness pre-filed written testimony was on, by  
18 Dr. Stirewalt. I'm not sure if I'm pronouncing that  
19 correctly. I apologize if I'm not.

20 WHEREUPON,

21 GERRY LOUIS STIREWALT

22 was called as a witness and, having been first duly  
23 sworn, was examined and testified as follows:

24 WITNESS STIREWALT: Your Honors, good  
25 morning. I am Gary Louis Stirewalt. I am the senior

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1 geologist and NRO responsible for the Parts of 2.5.1  
2 and 2.5.3. And I am under oath.

3 ADMIN. JUDGE WHITE: Thank you. Following  
4 up on the previous witness, in the second paragraph of  
5 your statement given in Answer 17 of the pre-filed  
6 testimony, you describe very specific activities that  
7 will be undertaken to verify compliance with this  
8 Permit Condition.

9 Among other things, you say that staff  
10 will assess the acceptability of the COL or CP  
11 applicant's geologic mapping methods. And this is  
12 geologic mapping of excavations.

13 WITNESS STIREWALT: Yes, sir.

14 ADMIN. JUDGE WHITE: Which is what this  
15 pertains to. To verify compliance with this Permit  
16 Condition, and the staff will ensure that standard  
17 procedures applied under an NRC approved quality  
18 assurance program were used for the geologic mapping  
19 activities.

20 Now, in your answer, and in fact in PSEG's  
21 answer to this topic as well, you Mentioned Regulatory  
22 Guide 1.132. Does this Regulatory Guide provide some  
23 detailed guidance for how these excavations should be  
24 mapped?

25 WITNESS STIREWALT: Your Honor, 1.132

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1 discusses under the time frame of construction mapping  
2 the kinds of work that should be done. But most of  
3 the detail is actually in 1.208.

4 ADMIN. JUDGE WHITE: Okay.

5 WITNESS STIREWALT: But between those two  
6 reg guides the details are laid out rather well.

7 ADMIN. JUDGE WHITE: Okay. So, there is  
8 specific guidance for what PSEG geologists should be  
9 doing when they map these excavations, after they've  
10 been cleaned and prepped?

11 WITNESS STIREWALT: Absolutely, Your  
12 Honor.

13 ADMIN. JUDGE WHITE: Is there a reason why  
14 that, why those guidance documents aren't referenced  
15 in the license condition as sort of laying out, this  
16 is what you need to be doing?

17 WITNESS STIREWALT: Is there a reason they  
18 aren't referenced in the way the Permit Condition is  
19 stated?

20 ADMIN. JUDGE WHITE: Yes, that's correct.

21 WITNESS STIREWALT: Is that the question?  
22 Well, that's a good question. I guess the thought was  
23 that there was necessarily a need to state it within,  
24 in case some parts of the guidance might in fact, in  
25 the future change. So rather than listing specific

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1 numbers, just to do it more broadly as the Permit  
2 Condition is currently constructed seemed wise.

3 ADMIN. JUDGE WHITE: I see. Yes, I just,  
4 it just came to mind because it did state specifically  
5 that one of the things that you were looking at, not  
6 necessarily the results of the mapping, but whether  
7 the techniques and process of the mapping met  
8 requirements. And so it just seemed as it would be  
9 useful to have those guidance documents in there.

10 Again, with regards to staff assessing the  
11 acceptability of the applicant's geologic mapping  
12 methods. Presumably the acceptability of their  
13 descriptions of these excavations. Will the applicant  
14 be submitting copies of their maps and descriptions to  
15 staff prior to the site examination?

16 WITNESS STIREWALT: They may or may not.  
17 If they do not submit it in advance, because some of  
18 the maps are really quite large, in point of fact.  
19 And they're a little bit difficult to transfer  
20 electronically.

21 But the way that it would be done, if we  
22 don't have stuff prior to, we literally have our hands  
23 and our eyes on those maps during any given audit or  
24 site inspection. We are able to look at them directly  
25 as we look at stuff in the field, and make a direct

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1 comparison.

2 So, whether we get them initially, the  
3 important part is still being able to look, to observe  
4 what's in the field, and do the match at that stage.

5 ADMIN. JUDGE WHITE: I see. And again, I  
6 ask that because it would seem useful to staff to have  
7 those materials in advance to look at them, and then  
8 say, well, we'd like to make sure this is here, make  
9 sure that is there, rather than having them spread out  
10 down in the bottom of a hole.

11 I wonder if you could clear up just a  
12 couple of geological questions that I have from your  
13 testimony as well. In that same paragraph, in Answer  
14 17 you discuss mapping the structures in "foundation  
15 grade level materials at the PSEG site." Does this  
16 refer to the Vincentown formation specifically?

17 WITNESS STIREWALT: The --

18 ADMIN. JUDGE WHITE: Foundation grade  
19 materials?

20 WITNESS STIREWALT: Pardon me, Your Honor.  
21 Yes, Your Honor. The foundation grade level is in  
22 fact taken down to the Vincentown. And that is the  
23 unit in which we do the direct observation, look at  
24 the materials, the rock types, the sediment types, as  
25 well as any potential structures. That's exactly

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1 correct.

2 ADMIN. JUDGE WHITE: Okay. Then the  
3 question sort of rose in my mind that you've  
4 emphasized the point that PSEG geologists and staff  
5 geologists will be primarily focused on Quaternary  
6 structures.

7 And given the much older age of the  
8 Vincentown, how would you determine whether faults or  
9 other tectonic structures in the Vincentown are or not  
10 Quaternary?

11 WITNESS STIREWALT: Very pertinent  
12 question, and a good one for a geologist. The manner  
13 in which you would determine whether or not -- And by  
14 the way, Quaternary, the age date here is 2.6 million  
15 years of age and older. And just for those who might  
16 need that little refresher.

17 But the way that you would determine, the  
18 stratigraph is well dated. And if you can look and  
19 see what units might be affected, and what units were  
20 not, then you would actually be able to bracket the  
21 age of that particular structure, and make the case  
22 for Quaternary or older. And that's really the field  
23 method.

24 You can use relative ages, what unit is  
25 offset, as a geologist knows, as offset, and what

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1 isn't. But that would be the manner in which you  
2 would go about determining whether it was Quaternary  
3 or older.

4 ADMIN. JUDGE WHITE: Okay. So there are  
5 some under-formed, or primary in situ deposits above  
6 the Vincentown that are not just part of dredge fill  
7 and the artificial part of Artificial Island. Is that  
8 correct? Some younger units that you could see  
9 whether or not they are deformed, or --

10 WITNESS STIREWALT: Your Honor, most of  
11 the materials that are above are actually because this  
12 is a filled in island. Most of the stuff is disturbed  
13 and not in place.

14 ADMIN. JUDGE WHITE: Right.

15 WITNESS STIREWALT: If something were  
16 found in the excavation, one would need to step  
17 outside of it, in fact, to determine whether or not  
18 you could make a judgment on whether Quaternary  
19 materials were displaced.

20 ADMIN. JUDGE WHITE: I understand. So the  
21 recognition of some kind of tectonic structure in the  
22 Vincentown at the bottom of a pit would actually  
23 trigger a more extensive staff reevaluation of the  
24 geologic structure of the site as a whole? Is that  
25 correct?

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1 WITNESS STIREWALT: That is very well put,  
2 Your Honor. Yes, that is correct.

3 ADMIN. JUDGE WHITE: Thank you. Finally,  
4 in pre-filed testimony by PSEG their Answer number 18  
5 to this issue. They state that any review of  
6 excavations would be undertaken as part of NRC staff's  
7 construction inspection activities, and not as  
8 satisfaction as this Permit Condition. Staff agreed  
9 fully with that statement?

10 WITNESS STIREWALT: We do, Your Honor.  
11 What the distinction being made here is, sort of  
12 separating the ministerial piece, which is the  
13 notification by the applicant that the excavations are  
14 ready for our examinations.

15 Separating that piece, as to say, the  
16 notification from the additional work that you've  
17 already alluded to, that would in fact follow that to  
18 confirm the absence of tectonic and non tectonic  
19 features in the excavation.

20 ADMIN. JUDGE WHITE: That's all the  
21 questions I have.

22 CHAIR RYERSON: Thank you. Judge Arnold,  
23 did you have any further questions?

24 ADMIN. JUDGE ARNOLD: No.

25 CHAIR RYERSON: Okay. Thank you.

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1 ADMIN. JUDGE WHITE: Thank you.

2 WITNESS STIREWALT: Thank you.

3 CHAIR RYERSON: The next topic we'll  
4 address is SER-3, which concerns the NRC staff's  
5 experience, primarily concerns the NRC staff's  
6 experience with hydraulic modeling. But I do have  
7 some questions to start for PSEG. So again, if Mr.  
8 Mallon and Mr. Robbillard will come up?

9 And, Mr. Welkie, could you put on the  
10 board, what I want is Table 2.4.5-4 from PSEG 004B as  
11 in bravo. I think it's at the PDF Page 403. That's  
12 it. Let's see, can you slide that so that we --

13 The important numbers I think are the ones  
14 at the bottom primarily. I don't know if it's  
15 possible to slide it up and make it bigger, and just  
16 reach the bottom of it. Yes. That would, that's  
17 probably the best view.

18 Again, gentlemen, I remind you under oath.  
19 I'll put my question to you, Mr. Mallon, unless you  
20 wish to defer it again. If I understand the  
21 anticipated elevation of the plant to be constructed  
22 eventually at the site here, that might be constructed  
23 at the site, the elevation of the plant is 36.9 feet.  
24 Is that correct?

25 WITNESS MALLON: That's correct.

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1 CHAIR RYERSON: And the design basis flood  
2 hazard is storm surge due to a probably maximum  
3 hurricane, correct?

4 WITNESS MALLON: That's correct.

5 CHAIR RYERSON: So, looking at this chart  
6 I believe, and I forget whether it was PSEG or the  
7 staff determined that what's identified as Run number  
8 2, the second column from the right, would be the most  
9 likely maximum water rise, which are maximum total  
10 water surface elevation at 32.1 feet. And that I take  
11 it would be four feet below the elevation of the  
12 plant.

13 WITNESS MALLON: That's correct.

14 CHAIR RYERSON: The left column of this  
15 chart shows 42.4 feet, which if that were to occur  
16 would be roughly five and a half feet above the  
17 elevation of the plant. And so, my question for you  
18 is, why is Run number 2 the much more reasonable  
19 scenario to plan for, instead of planning for 42.4  
20 feet?

21 WITNESS MALLON: So, how you perform a PMH  
22 analysis is driven by Regulatory Guide 1.59 and ANSI  
23 Standard 2.8. And it tells you what criteria to  
24 establish. Could we have that back up, please? Thank  
25 you.

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1           You are, the ANSI standard says you should  
2           be trying to have an analysis that approximates a risk  
3           of one times ten to the minus sixth, or roughly one in  
4           a million.

5           We had undertaken initially a  
6           deterministic model. And we then looked at a  
7           probabilistic model. And we moved back to a  
8           deterministic model in order to facilitate a timely  
9           review.

10           The 32.1 value in that second column from  
11           the right represents the storm that we feel, and the  
12           staff review has independently concluded, supports  
13           that one times ten to the minus sixth, or one in a  
14           million chance of a flood.

15           CHAIR RYERSON: And I believe,  
16           historically I think the largest storm surge from a  
17           hurricane was maybe Katrina at 29 feet or so. Is that  
18           correct?

19           WITNESS MALLON: Yes. And, you know, that  
20           was certainly down in the Gulf of Mexico.

21           CHAIR RYERSON: Okay.

22           WITNESS MALLON: So the methodology is  
23           conservative.

24           CHAIR RYERSON: Okay. That I think is all  
25           I have. Judge Arnold.

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1 ADMIN. JUDGE ARNOLD: I have questions for  
2 the staff on this, but not for PSEG.

3 CHAIR RYERSON: Judge White, did you want  
4 to ask any questions of PSEG?

5 ADMIN. JUDGE WHITE: Not right now. Thank  
6 you.

7 CHAIR RYERSON: All right. Thank you.  
8 You may be back. And I remind each of you, you're  
9 under oath. And if you would begin by stating your  
10 full names, please.

11 WHEREUPON,

12 JOSEPH GIACINTO  
13 was called as a witness and, having been first duly  
14 sworn, was examined and testified as follows:

15 WITNESS GIACINTO: Joseph Giacinto. And  
16 I am under oath, Your Honor.

17 WHEREUPON,

18 HENRY JONES  
19 was called as a witness and, having been first duly  
20 sworn, was examined and testified as follows:

21 WITNESS JONES: Dr. Henry Jones. I'm  
22 under oath.

23 ADMIN. JUDGE ARNOLD: The written  
24 testimony on this topic seemed mostly to focus on  
25 answering the question of why the coarse nodalization

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1 was found to be adequate for the flooding calculation.

2 Unfortunately, that's not what the  
3 question was asking. So I must not have asked it  
4 properly. Let me pose it again to you in a  
5 hypothetical form.

6 Consider we're down the road a ways, say  
7 in the 2060s, and the plant is operating on Artificial  
8 Island. Early Site Permit was granted back in 2016,  
9 and COL Application in 2021, approved in 2026. And  
10 now, you know, it's built, and it's time to re-license  
11 the plant. And they're going back to see what was  
12 done in the original evaluations.

13 They go back to the site safety evaluation  
14 report. And in Section 2.4.3.4.3, computation of peak  
15 water levels, they see the following statements. The  
16 overall resolution of the applicant's basin model was  
17 somewhat coarse. They see, the staff recognizes that  
18 these assumptions are needed.

19 And then finally, the staff finds that the  
20 modeling conducted by the applicant was adequate for  
21 obtaining an appropriately conservative representation  
22 of flows resulting from postulated events.

23 Now, the licensee looks and sees, notes  
24 that that computer code is no longer available. And  
25 they don't -- Are they going to go back to existing

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1 staff documents and figure out -- What was the logic  
2 by which the staff found the modeling conducted to be  
3 adequate, despite it being coarser than you expected?

4 WITNESS GIACINTO: Yes, Your Honor. To  
5 start out, the basin is very large. It's on the order  
6 of 14,000 square miles, which is bigger than the State  
7 of Maryland, essentially. So it's a very large basin.

8 And looking at the site setting, our  
9 conceptual understanding of the site, for the probably  
10 maximum flood at the location of the PSEG site, it's  
11 apparent from historical record that when there's  
12 flooding of historical proportions on the non-tidal  
13 portions of the Delaware River Basin, the effect at  
14 the PSEG site was only a few feet, in terms of changes  
15 in water level.

16 And that's simply because this specific  
17 area is heavily influenced by tidal effects. Even  
18 though it is called the Delaware River at that point,  
19 it's essentially an estuary where it's a very wide  
20 open connection to the Atlantic, where the water can  
21 move in and out quickly with the tides.

22 And of course, you can absorb that  
23 flooding of historical proportions. So the river  
24 model was sufficient to adequately characterize the  
25 Delaware River Basin flow system, given that the

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1 effects of probably maximum storm surge are the  
2 overwhelming driver in terms of flood elevations at  
3 this site.

4 You'll see that in terms of storm events  
5 where the tidal gauge will show maybe tens of feet of  
6 change, whereas in the historical flood of 2006, which  
7 was, you know, a tremendous rainfall event that  
8 dropped as much as 15 inches of rain on the Delaware  
9 Basin. And then there was a lull, and then it dropped  
10 an additional six inches.

11 At the PSEG site you only saw a change of  
12 approximately three feet in the water level. Whereas  
13 the primary driver in the changes were the normal  
14 tidal cycles, the diurnal tidal cycles.

15 So, even though the river model was, some  
16 of course from the time steps, it adequately  
17 represents the site, given that the primary driver was  
18 storm surge. And the river flows and elevations were  
19 actually incorporated into the probable maximum storm  
20 surge, in terms of that table that you saw earlier,  
21 the exhibit.

22 So, and my colleague, Dr. Henry Jones, can  
23 explain the storm surge effect and how that was all  
24 rolled in, since he was the reviewer.

25 ADMIN. JUDGE ARNOLD: Okay. But my real

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1 question is, to me there's an apparent lack of logic  
2 between the two statements, coarse resolution and  
3 adequate, that the non-professional might not  
4 understand how you made that determination of  
5 adequate, when you know it's coarse model.

6 Is this just something that is so obvious  
7 to somebody who does the calculations, that there's no  
8 need to state it?

9 WITNESS GIACINTO: I believe that would  
10 true, in that given the size of the basin, and the  
11 exercise that would be involved in fine tuning this  
12 river model, and decreasing the time step.

13 It's not just a matter of you would just  
14 decrease the time step. All of the numerics are  
15 interrelated, in terms of, if you increase, or  
16 decrease the time step, I'm sorry. That would highly  
17 likely have an effect on the rest of the model where  
18 it would not solve, for example.

19 Then you would have to go in and see where  
20 other efficiencies could be gained. So, you would do  
21 this throughout the basin, which is very large. And  
22 at that point you could potentially increase the  
23 precision of the mode.

24 But to what end, in terms of our  
25 objective, which would be determining the design basis

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1 flood, which is probably maximum storm surge. So the  
2 return on the information gained would not be very  
3 large, in terms of our type of study.

4 ADMIN. JUDGE ARNOLD: Okay. So as a  
5 professional who deals in this, you know, this is just  
6 not a hard decision to make, that that nodalization  
7 was adequate?

8 WITNESS GIACINTO: I believe that's true,  
9 yes.

10 ADMIN. JUDGE ARNOLD: Okay. Thank you.  
11 That's all I wanted to know.

12 CHAIR RYERSON: Judge White.

13 ADMIN. JUDGE WHITE: No. Nothing here.

14 CHAIR RYERSON: You may step down. You  
15 may be back. Actually, let me ask, because Judge  
16 White is going to deal with the next topic.

17 ADMIN. JUDGE WHITE: That's correct. I'd  
18 like Dr. Jones to stay, please. And, Mr. Quinlan. I  
19 believe those are the only two staff witnesses that  
20 address this Topic 4.

21 WHEREUPON,

22 KEVIN QUINLAN

23 was called as a witness and, having been first duly  
24 sworn, was examined and testified as follows:

25 CHAIR RYERSON: And, Mr. Quinlan, if you

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1 would state your full name? And I remind you, you're  
2 under oath.

3 WITNESS QUINLAN: Yes. My name is Kevin  
4 Quinlan. And I'm under oath.

5 CHAIR RYERSON: Thank you.

6 ADMIN. JUDGE WHITE: Thank you. This  
7 topic addressed the effect of climate change with  
8 regards to, specifically with regards to storm surge  
9 modeling. And as I understand the pre-filed written  
10 testimony on this topic, climate change effects are,  
11 with regards to storms or hurricanes, are accounted  
12 for in two ways.

13 First, staff models for estimating the  
14 maximum total water surface elevation, included  
15 projected climate change induced sea level rise. And  
16 the second one that appeared to me was that  
17 calculations of maximum hurricane winds speeds assumed  
18 that the frequency of Atlantic hurricanes would  
19 substantially increase. Like, I think it said double  
20 in those models, calculations.

21 So, I'd like to ask you if I'm, first of  
22 all, if I'm characterizing those points correctly.  
23 And secondly, if there were other ways that staff  
24 accounted for climate change effects with regards to  
25 their assessment of hazards posed to the site by

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1 hurricanes?

2 WITNESS JONES: This is Dr. Jones.  
3 There's actually two areas that you mentioned. The  
4 first area, which relates to Mr. Quinlan's area, which  
5 is for hurricane wind speeds, is calculated  
6 differently than for storm surge.

7 ADMIN. JUDGE WHITE: Right, yes.

8 WITNESS JONES: For storm surge, since  
9 it's deterministic, the frequency is not a factor --

10 ADMIN. JUDGE WHITE: That's --

11 WITNESS JONES: -- in our determination.  
12 Whereas, for his, for wind speed characteristics it is  
13 a factor in his analysis.

14 ADMIN. JUDGE WHITE: Yes. I understand  
15 that. Because this question, or this topic simply  
16 asked for how staff takes into account climate change  
17 for storms in general, and the two of you answered  
18 separately for really different, for quite different  
19 types of phenomena, or quite different types of  
20 hazards, that's, I wanted to mention both.

21 But the other question is, are those the  
22 only two ways that climate change effects are  
23 accounted for in the modeling, with regards to any  
24 hazard related to storms at the site?

25 WITNESS JONES: Dr. Jones again. For

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1 storm surge, sea level rise is the only factor that we  
2 require to account for climate change, because we do  
3 such a conservative analysis. Because it depends on  
4 multiple parameters, and is deterministic.

5 So, you have the latitudes. You have the  
6 radius of the maximum winds, the bathymetry. And all  
7 of this, you get to the point where it is only a set  
8 of parameters that will cause the probably maximum  
9 storm surge for a specific site.

10 And the only thing that can increase the  
11 storm surge after that is the intensity of the storm.  
12 So all of those are fixed. If they don't happen in  
13 combination you don't get the probably maximum storm  
14 surge.

15 So, sea level rise, they calculate through  
16 actual gauges that are projected out to the future.  
17 And what we found and experienced, that is actually a  
18 good match to what the climate reports project. And  
19 so, we have conservatisms on top of that.

20 Instead of mean tide we use ten percent  
21 exceedance high tide. And so, we put so many  
22 conservatisms on that, that it actually swamps the  
23 climate change factor altogether. And sometimes it  
24 washes out. Because we use the sea level rise in the  
25 initial sea level that we start with.

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1           And that doesn't always, you know, it's  
2           not always a linear addition that you will have, sea  
3           level rise will add to a higher storm surge. And so,  
4           we feel that that's a adequate and very conservative  
5           way of accounting for climate change in storm surge.

6           WITNESS QUINLAN: This is Kevin Quinlan.  
7           Speaking from the hurricane wind speed perspective,  
8           the NUREG, NUREG/CR-7005 is what is used to calculate  
9           the ten to the minus seventh, or ten million year  
10          return period hurricane wind speeds.

11          As part of that reg guide, or as part of  
12          the NUREG, to try to account for variability in  
13          climate it calculated the effect of doubling the  
14          frequency of hurricanes in the Atlantic and Gulf  
15          Coasts.

16          And it turned out that it only increased  
17          the maximum hurricane winds speeds by about two  
18          percent. And for the PSEG site it would have resulted  
19          in about a three mile per hour increase.

20          And given that we're looking at ten  
21          million year return frequency, a hurricane wind speed  
22          of 159 miles per hour for three second gusts, which  
23          far exceeds anything seen in that region of the  
24          country, the staff felt that that adequately bounded  
25          any potential effects from climate change.

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1 ADMIN. JUDGE WHITE: Yes, and I guess I  
2 understand these are really two very different ways of  
3 approaching and yours, Mr. Quinlan, is a probabilistic  
4 model and, Dr. Jones, you are talking about a  
5 determinative model.

6 WITNESS JONES: That's correct, Your  
7 Honor.

8 ADMIN. JUDGE WHITE: That's correct, yes.  
9 And so, again, you are saying -- Well, let me go on.  
10 I have a figure that I would like to, or a table that  
11 I would like to take a look at and it's very similar  
12 to the one we had before except mine is actually a  
13 different one but it has the same information, and  
14 it's Table 2.4.5-2 on SER NRC 003, and I believe it's  
15 PDF 166.

16 (Off microphone comments)

17 ADMIN. JUDGE WHITE: Yes, that's it.  
18 Thank you. And this is very similar to what we were  
19 looking at before. And all of this question came  
20 about, or this topic came about because of the  
21 discussion in the SER of the USGCRP Report on climate  
22 change effects in the United States, or projected  
23 climate change effects in the United States.

24 And in the SER it mentions from this  
25 report that the intensity of tropical cyclones in the

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1 Atlantic are projected to increase in the future. Now  
2 on this table you present, and previously mention, a  
3 variety of parameters that go into the models that  
4 ultimately determine the maximum total water surface  
5 elevation.

6 When the USGCRP Report simply states  
7 "intensity," and this isn't frequency because they  
8 separately address that, they are talking about  
9 intensity, which of these parameters are they  
10 referring to?

11 I mean which of these parameters would be  
12 affected if the intensity of tropical storms  
13 increased?

14 WITNESS JONES: Dr. Henry Jones again. It  
15 would be the central pressure. The central pressure  
16 is directly related to the sea surface temperature.

17 The higher the sea surface temperature the  
18 lower the central pressure you can get which increases  
19 the pressure gradient which you'd get higher wind  
20 velocities which drive the storm surge.

21 ADMIN. JUDGE WHITE: Okay. So a central  
22 pressure would that affect the radius, not  
23 necessarily?

24 WITNESS JONES: Not necessarily.

25 ADMIN. JUDGE WHITE: Would it affect the

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1 forward speed, not necessarily?

2 WITNESS JONES: No, it's independent.

3 ADMIN. JUDGE WHITE: Would it affect the  
4 maximum wind speed?

5 WITNESS JONES: Yes.

6 ADMIN. JUDGE WHITE: Okay. Would that  
7 ultimate -- what affects the wave run-up?

8 WITNESS JONES: Wave run-up is once you  
9 have a storm surge and you have the sea levels rising  
10 but on top of that you have the wind blowing, so you  
11 have wind waves on top of that and that's what causes  
12 your damage to structures in storm surges, unlike  
13 tsunami where the wave comes through and it's massive  
14 and it's a free wave.

15 This is a forced wave but it just rises  
16 slowly over time but as the wind waves on top of that  
17 -- So what happens it's going to have to dissipate its  
18 energy so it's going to have to, like on a beach it's  
19 going to have to crest and it's going to have to  
20 crash.

21 And what happens, if you're walking along  
22 the beach you notice that when the wave crashes the  
23 water runs up on the beach, and that's what wave run-  
24 up is.

25 When the wave finally breaks you get this

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1 water rushing up and it's going to hit some barriers,  
2 it's going to hit the structure, and what we look at  
3 is how does that increase the final total water level  
4 once it breaks up against a structure, so it's  
5 specific to whatever structure or beach profile that  
6 you have.

7 ADMIN. JUDGE WHITE: I see. So if we  
8 think about the fact that the report previously  
9 referred to suggests that some of these parameters  
10 then would in fact cause, potentially, increase in the  
11 future, and that's for tropical storms that are  
12 generated in the tropics.

13 You have stated that probably the most  
14 important factor for why tropical storms of a very  
15 large size may not be as large if they impacted the  
16 PSEG site is because these storms would then travel  
17 over cooler water.

18 So I guess if you just briefly give me a  
19 comment about the fact that if indeed tropical storms  
20 in the tropics are in fact larger, in other words  
21 there are more Category IV or Category V storms, does  
22 that still mean that by the time they would reach the  
23 Mid-Atlantic States or the Northeast, whichever part  
24 of the country you include the site in, their  
25 intensity would be sort of ameliorated by traveling

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1 over colder water, is that what you would --

2 (Simultaneous speaking)

3 WITNESS JONES: That's correct, Your  
4 Honor. This is Dr. Jones again. And for the audience  
5 what the Judge means by "larger," it's not the size we  
6 are talking about, it's actually the intensity.

7 ADMIN. JUDGE WHITE: That's correct.  
8 Thank you.

9 WITNESS JONES: And so if -- The climate  
10 change models, what they do is get an average  
11 planetary temperature, and the assumption is that they  
12 planetary average temperature increases, therefore,  
13 since we are covered the majority by water that the  
14 water surface temperatures should increase, therefore,  
15 it should be able to generate more tropical cyclones  
16 with a greater intensity.

17 It's not site-specific, it's not regional,  
18 actually you can generate more and it never reach  
19 landfall, and it doesn't address those that would  
20 reach landfall, and, actually, some of the climate  
21 change will actually inhibit tropical cyclone growth  
22 because you have a shear which will actually increase  
23 at the upper levels of the atmosphere which will  
24 actually take off that heat engine.

25 So we don't really know right now what the

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1 effect will be, but you're actually right, after you  
2 pass Cape Hatteras you enter colder water, but you're  
3 also getting the effect of dry continental airs now  
4 coming into your cyclone, and the greatest example of  
5 that was Sandy.

6 So once Sandy came up and started having  
7 more continental dry air coming in and it transformed  
8 into an extra-tropical storm, which became large, 1500  
9 nautical miles, but its intensity became like a  
10 regular winter storm and you had only winds up to  
11 maybe 50 knots or more.

12 And that's what would happen if you try to  
13 make that landfall at PSEG, it would have to get close  
14 to shore, it would have colder water, it would be  
15 moving fast, and it would be ingesting colder, drier  
16 air and so the intensity would go down.

17 But remember we have a Category IV storm  
18 here, and Category V is the highest you can get --

19 ADMIN. JUDGE WHITE: Right.

20 WITNESS JONES: -- and this one actually  
21 is three miles per hour higher than Katrina and is  
22 actually about ten millibars lower central pressure  
23 than Katrina and that would produce a storm surge at  
24 three feet higher than the United States record.

25 ADMIN. JUDGE WHITE: Okay. Just very

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1 briefly in looking at the USGCRP Report, it also talks  
2 about projecting general tenancy for more intense but  
3 fewer storms overall outside the tropics with more  
4 extreme wind events and high ocean waves in a number  
5 of regions.

6 I didn't notice any comment anywhere about  
7 models or estimates or discussions of extra-tropical  
8 storms. Is it your opinion then or is there  
9 documentation that extra-tropical storms simply aren't  
10 going to compete with tropical storms with regards to  
11 generating storm surge hazard at the site?

12 WITNESS JONES: Dr. Jones again. Your  
13 Honor, yes, when they do the analysis the applicant is  
14 required to look at extra-tropical as well as tropical  
15 and they have to determine which one would be the  
16 driver.

17 In the case of the Mid-Atlantic it will  
18 always usually be the tropical storms. Your extra-  
19 tropical will cover a wider area but with lower storm  
20 surge where a tropical storm will have a higher storm  
21 surge but a smaller area that it will affect.

22 And so you have the Nor'easters and so  
23 PSEG is always hit, every year you are going to have  
24 a Nor'easter, so we have a long record of that, but it  
25 will never produce the same storm surge as a tropical

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1 storm.

2 ADMIN. JUDGE WHITE: So even the largest  
3 of these if they increase in frequency are not likely  
4 to pose a hazard compared to the hazard potentially  
5 posed by tropical?

6 WITNESS JONES: Exactly, Your Honor, and  
7 Sandy, once again, is the greatest example of that.  
8 It was the largest extra-tropical storm. We had winds  
9 even in Rockville of 50 miles per hour.

10 It actually affected the Great Lakes, but  
11 it landed North of the PSEG proposed site and was less  
12 than seven feet of water.

13 ADMIN. JUDGE WHITE: Okay. I have one  
14 final question. In your response to Question 19 in  
15 the Board's initial set of questions on the SER you  
16 stated that "The PSEG ESP site has a site elevation of  
17 36.9 feet, which is above the design basis flood of  
18 32.09, and for this reason a future facility would not  
19 necessarily require additional flood protection for  
20 safety systems or structures."

21 I see in the last sentence of Answer 5 Mr.  
22 Quinlan states "If it becomes evident that long-term  
23 climatic change is influencing the most severe natural  
24 phenomena reported at the PSEG site the Combined  
25 License, COL, holders have a continuing obligation to

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1 ensure that their plants stay within the licensing  
2 basis."

3 So I guess I'd ask Mr. Quinlan since it  
4 was his statement, what does this mean if anything in  
5 terms of NRC action?

6 In other words, again using Judge Arnold's  
7 hypothetical, 15 years from now all of a sudden it  
8 becomes apparent that, you know, our worst estimates  
9 of climate change are coming true and the storms that  
10 are hitting the East Coast do seem to be larger than  
11 anticipated, much larger than anticipated, what would  
12 be NRC's obligation or responsibility to reassess the  
13 safety design in light of that new information at that  
14 stage, if any?

15 WITNESS QUINLAN: This is Kevin Quinlan.  
16 I believe the NRC's responsibility would be to ensure  
17 that our guidance is staying up-to-date with the most  
18 conservative or the most realistic estimates.

19 In this case we just came out with the  
20 Hurricane Wind Speed Regulatory Guide a couple of  
21 years ago, which did consider much of the state of the  
22 knowledge information.

23 This statement is meant more of a general  
24 statement to point out, to acknowledge that changes in  
25 the climate may happen at the site and that the

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1 license holders need to continually ensure that their  
2 site is safe to operate.

3 MR. ROACH: Judge White, if I could make  
4 a brief comment. Kevin Roach. I just want to also  
5 point out that the NRC has regulatory tools at its  
6 disposal, including 50.54(f) letters and orders that  
7 it can issue to licensees to ensure adequate  
8 protection.

9 ADMIN. JUDGE WHITE: That's all.

10 CHAIR RYERSON: Thank you, Judge White.  
11 Dr. Jones, I have a couple of questions really  
12 occasioned by your reference to the cooler water North  
13 of Cape Hatteras.

14 I take it the reason there is cooler water  
15 North of Cape Hatteras is that presently the Gulf  
16 Stream essentially tracks, squeezes between Miami, or  
17 Florida and the Bahamas and then pretty much parallels  
18 the U.S. Coast until you get to Cape Hatteras and at  
19 that point the Gulf Stream veers a little bit to the  
20 East, maybe the U.S. falls away to the West at that  
21 point, I'm not sure, but there is a separation at that  
22 point and the water, the Gulf Stream is headed  
23 towards, warming Europe, North Europe, and meanwhile  
24 in the United States the cooler water from New England  
25 can flow down to the New Jersey Coast because the Gulf

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1 Stream is fairly far off at that point.

2 I think as a result historically, if I  
3 understand what you have written, New Jersey, since  
4 the Civil War whenever records were kept, has had  
5 three landfalls of Category III hurricanes.

6 It's never had a Category IV hurricane  
7 land, which is what you actually have planned for, but  
8 all of your work and your modeling I take it assumes  
9 no change in the basic path of the Gulf Stream, is  
10 that correct?

11 WITNESS JONES: Yes, Your Honor. This is  
12 Dr. Jones again. Because it's deterministic we don't,  
13 we take the most conservative route. We don't assume  
14 anything about the Gulf Stream, about sea surface  
15 temperature, we just drive the strongest storms we can  
16 up into the area of the site regardless of what the  
17 environment is.

18 So we take the very conservative  
19 approaches that we are going to send, what we can see  
20 reasonably, the maximum intensity storms we can up  
21 there, and sometimes even beyond, to see what's  
22 bounding and then get realistic after that, so we  
23 actually took a more bounding approach to it.

24 In the case of the hurricane winds, the  
25 author of that research actually took a, actually had

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1 decay, the ocean model took into account the decay of  
2 the sea surface temperatures which actually then would  
3 reduce the hurricane wind speed. We don't decay the  
4 hurricane wind speed at all.

5 CHAIR RYERSON: Okay. If, hypothetically,  
6 due to climate change or whatever forces, the Gulf  
7 Stream sort headed to Newfoundland, it's a dead end,  
8 and it think the Gulf Stream is only like 60 or 80  
9 miles wide, very fast and very warm, could that result  
10 in a Category V hurricane hitting the coast of New  
11 Jersey, I mean is that a one in a million or one in a  
12 billion probability or would it be much higher?

13 WITNESS JONES: It's more than that, Your  
14 Honor, because you would have changed the whole  
15 climate of the planet.

16 CHAIR RYERSON: Yes.

17 WITNESS JONES: To change the Gulf Stream  
18 you would change what we call the Atlantic Conveyor  
19 Belt, which you mentioned, which you have colder water  
20 sinking coming from the North and warm water coming up  
21 to keep the planet at an even temperature.

22 For the Gulf Stream to shift, and I can't  
23 imagine anything in my background that would cause it  
24 to shift North, most likely with colder water coming  
25 down maybe shifting away from Europe at the worst.

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1                   And so I can't, that would be beyond this  
2 century. It would take quite awhile. It would be  
3 very dramatic and we would see that coming.

4                   CHAIR RYERSON: It would certainly make  
5 the people in Europe unhappy.

6                   WITNESS JONES: Yes. Yes, Your Honor.

7                   CHAIR RYERSON: I guess that's all I have.  
8 Judge Arnold?

9                   ADMIN. JUDGE ARNOLD: I'm fine.

10                  CHAIR RYERSON: Okay. Thank you. Let's  
11 see, why don't we take another break and resume at  
12 11:15. The next topic will be SER 5 concerning  
13 Fukushima.

14                  (Whereupon, the above-entitled matter went  
15 off the record at 11:05 a.m. and resumed at 11:17  
16 a.m.)

17                  CHAIR RYERSON: All right, we are up to  
18 what's been identified as SER Topic 5, which concerns  
19 how the Fukushima events may have affected review of  
20 PSEG's application. And, Judge Arnold, I think you  
21 are going to begin on that topic?

22                  ADMIN. JUDGE ARNOLD: Yes. I only have  
23 questions for Mr. Chowdhury, so come on down.

24                  CHAIR RYERSON: And, Mr. Chowdhury, we  
25 remind you again, you are under oath.

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1 WITNESS CHOWDHURY: I am, yes, Your Honor.

2 ADMIN. JUDGE ARNOLD: From your written  
3 testimony I have the impression that as a result of  
4 Fukushima recommendations there were numerous insights  
5 from the accident that were considered for evaluation  
6 but when it comes right down to the permit review  
7 there was very little insight from the accident that  
8 were applicable to an early site permit review, is  
9 that a reasonable way to view that?

10 WITNESS CHOWDHURY: That is correct, Your  
11 Honor.

12 ADMIN. JUDGE ARNOLD: Okay. And you did  
13 have two recommendations that you considered, 2.1  
14 directly from the Near-Term Task Force was "order  
15 licensees to reevaluate the seismic and flooding  
16 hazards at their sites against current NRC  
17 requirements and guidance and if necessary update the  
18 design basis and SSCs important to safety to protect  
19 against the updated hazards."

20 Now that really looks to me as to have  
21 been written for operating plants who have received  
22 their license and they have put their seismic and  
23 flooding design basis on somewhere in its direction to  
24 go, dust those off and make sure they're current.

25 Is that a reasonable interpretation of the

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1 intent?

2 WITNESS CHOWDHURY: Yes, Your Honor, it  
3 is. I should like to mention that the staff, knowing  
4 what they know coming from the recommendations, they  
5 closely look at all the possible and potential  
6 application of these recommendations for the current  
7 licensing activities.

8 ADMIN. JUDGE ARNOLD: And for this early  
9 site permit basically this recommendation boils down  
10 to verifying that the application used current NRC  
11 requirements, guidance, correct?

12 WITNESS CHOWDHURY: That is correct.

13 ADMIN. JUDGE ARNOLD: Yes, okay. And then  
14 Recommendation 9.3, "determine and implement the  
15 required staff to fill all necessary positions for  
16 responding to a multi-unit event, conduct periodic  
17 training and exercises for multi-unit and prolonged  
18 station blackout scenarios, ensure that EP equipment  
19 and facilities are sufficient for dealing with multi-  
20 unit and prolonged station blackout scenarios, provide  
21 a means to power communications equipment needed to  
22 communicate onsite and offsite during a prolonged  
23 station blackout and maintain ERDS capability  
24 throughout the accident."

25 Now you considered this one to be

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1 applicable because the applicant had submitted  
2 complete and integrated emergency plans, correct?

3 WITNESS CHOWDHURY: Your Honor, the staff  
4 expert who reviewed the application and considered the  
5 Recommendation 9.3 details determined that this be  
6 applicable and primarily because this is a complete  
7 and integrated emergency plan submitted with the ESP  
8 application, which is equivalent to or the same as  
9 would be submitted with the COL application.

10 ADMIN. JUDGE ARNOLD: Okay. But then  
11 apparently, you know, this, you found it applicable  
12 because it was a complete and integrated emergency  
13 plan but since they hadn't selected the technology  
14 they just could not submit the information required  
15 for this particular recommendation?

16 WITNESS CHOWDHURY: The staff did not want  
17 to ignore it all together because this is an ESP  
18 application and a technology has not been selected,  
19 therefore, the staff identified two permit conditions  
20 for these to be carried forward into the COL or  
21 subsequent licensing activities and the staff expert  
22 can give you details and explain.

23 ADMIN. JUDGE ARNOLD: The impression I get  
24 is that there is not a whole lot of benefit to  
25 spending a lot of time reviewing Fukushima

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1 recommendations of an early site permit, that our  
2 regulations are adequate with that.

3 WITNESS CHOWDHURY: That is correct, Your  
4 Honor, and I should also like to make sure that we  
5 make it clear to you that the existing guidance  
6 documents and then the Standard Review Plan adequately  
7 address this, everything within the scope of the early  
8 site permit application.

9 ADMIN. JUDGE ARNOLD: Okay. Thank you,  
10 that's all I had.

11 WITNESS CHOWDHURY: Okay.

12 CHAIR RYERSON: Judge White, did you have  
13 questions?

14 ADMIN. JUDGE WHITE: No, I don't.

15 CHAIR RYERSON: Okay. You may step down.  
16 Thank you.

17 WITNESS CHOWDHURY: Thank you.

18 CHAIR RYERSON: The next topic is SER 6,  
19 which concerns atmospheric dispersion of possible  
20 releases. And, again, I think, Judge Arnold, you are  
21 going to start?

22 ADMIN. JUDGE ARNOLD: Yes. I would like  
23 to start with staff, and I believe that's Mr. Quinlan.

24 WITNESS QUINLAN: Kevin Quinlan. I am  
25 still under oath.

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1 ADMIN. JUDGE ARNOLD: Okay. In your  
2 answer to Question 7 of your testimony you mentioned  
3 a joint frequency distribution of wind speed.

4 Can you describe what this entails, what  
5 is it, and does it use the same 16 22-1/2 degree  
6 sectors that you mentioned earlier in our answer?

7 WITNESS QUINLAN: Yes. A joint frequency  
8 distribution is a way of summarizing multiple years of  
9 meteorological data. Typically the data will come to  
10 us in hourly format, so 8760 observations for one year  
11 or over 24000 for a 3-year period such as the PSEG  
12 dataset.

13 A joint frequency distribution summaries  
14 the wind speed, the atmospheric stability class, and  
15 the direction all into one smaller input file that is  
16 then used in the modeling.

17 ADMIN. JUDGE ARNOLD: I know that wind  
18 speed is a vector quantity and a straight average  
19 doesn't do anything to characterize a vector, so what  
20 form does this take, is it basically like a large  
21 table?

22 WITNESS QUINLAN: Yes. It has 16 columns,  
23 one for each of the wind direction sectors, and then  
24 the number of rows may vary depending on how many wind  
25 speed classes they have chosen, and then it will also

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1 account for the stability classes that will be taken  
2 into consideration and really account.

3 So for a given wind speed class, a given  
4 stability class, and a given wind speed, or, I'm  
5 sorry, wind direction, wind speed, and stability, it  
6 will, there will be a counter there.

7 So, you know, maybe ten hours of this  
8 condition, 50 hours of another condition, and this  
9 table summarizes those conditions.

10 ADMIN. JUDGE ARNOLD: So it would be like  
11 a 3-Dimensional table where one dimension is wind  
12 direction, another is wind speed, and the other is  
13 stability class?

14 WITNESS QUINLAN: Yes, I believe you could  
15 describe it that way.

16 ADMIN. JUDGE ARNOLD: When you developed  
17 this frequency distribution using three years of data  
18 are the three years similar, you know, if you just  
19 compared one year to another, are they similar, or did  
20 you do any evaluation comparing the table to an  
21 individual year to see how well it characterized it?

22 WITNESS QUINLAN: Yes, Your Honor. When  
23 the data was submitted to us we did a rigorous quality  
24 assurance of each year individually and as a whole to  
25 make sure that the data was complete.

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1           They have to have a 90 percent  
2 recoverability for each of the different measured  
3 variables, but then we also look to see how each year  
4 compares to the other years to make sure that there is  
5 not wild changes in the meteorology.

6           ADMIN. JUDGE ARNOLD: Okay. And you found  
7 that this distribution was a reasonable  
8 representation?

9           WITNESS QUINLAN: Yes.

10          ADMIN. JUDGE ARNOLD: If you look at the  
11 wind speed and direction and try to characterize it on  
12 the average does it vary as a function of the time in  
13 year, is winter different than summer?

14          WITNESS QUINLAN: Yes, Your Honor. The  
15 mean flow at the site varies between, by season. I  
16 don't have the exact details in front of me, but  
17 generally in the winter you would expect winds more  
18 from the West and Northwest versus the warmer summer  
19 months, the conditions would generally be more from  
20 the South.

21          ADMIN. JUDGE ARNOLD: In your answer to  
22 Question 8 you state "No unique topographical features  
23 preclude the use of the XOQDOQ model for the PSEG."

24                 Could you tell me what types of  
25 topographical features could preclude its use?

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1                   WITNESS QUINLAN:   Generally, the most  
2                   common one would be a complex terrain site, so a large  
3                   mountain range nearby.  Bodies of water are fairly  
4                   common and are accounted for in the model, so there  
5                   were no unique conditions at the site that would  
6                   preclude us from using this model.

7                   ADMIN. JUDGE ARNOLD:  You do have bodies  
8                   of water, but that's just not big enough to cause a  
9                   problem?

10                  WITNESS QUINLAN:  Correct, yes.

11                  ADMIN. JUDGE ARNOLD:  This code, do you  
12                  try to pronounce it or do you just spell out the  
13                  letters?

14                  WITNESS QUINLAN:  We refer to it exactly  
15                  as you did with XOQDOQ, yes.

16                  ADMIN. JUDGE ARNOLD:  Okay.  Now that  
17                  code, XOQDOQ, does it have any use other than nuclear  
18                  power plants, is it used in any other field where they  
19                  might be looking for dispersion?

20                  WITNESS QUINLAN:  It directly incorporates  
21                  the guidance provided to the staff and to the industry  
22                  in Reg Guide 1.11.  I think there are features about  
23                  it that may be incorporated in other dispersion models  
24                  throughout the meteorological field, but typically  
25                  this code is only used for nuclear reactor licensing.

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1 ADMIN. JUDGE ARNOLD: Are there similar  
2 codes used in other fields?

3 WITNESS QUINLAN: Yes. The EPA has their  
4 own atmospheric dispersion models and even the NRC  
5 uses other varying types of atmospheric dispersion  
6 models for different purposes.

7 ADMIN. JUDGE ARNOLD: And have you  
8 compared -- Has XOQDOQ been compared to other codes or  
9 --

10 WITNESS QUINLAN: Yes, it has as far as  
11 the reasonableness of it.

12 ADMIN. JUDGE ARNOLD: Yes.

13 WITNESS QUINLAN: And XOQDOQ code is used  
14 for routine releases over an annual average and we  
15 have other codes that are used for shorter durations.

16 ADMIN. JUDGE ARNOLD: Okay. How could the  
17 plant design affect the actual Chi over Q and D over  
18 Q values?

19 WITNESS QUINLAN: The most obvious way  
20 would be the size of the buildings themselves. We  
21 would consider the building wake, so if there is a  
22 large building on your release you would then consider  
23 the potential effects of building wake on the plume  
24 itself.

25 ADMIN. JUDGE ARNOLD: Yes. Okay, that's

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1 all the questions I have for you.

2 CHAIR RYERSON: Okay. Do you have  
3 questions for other witnesses?

4 ADMIN. JUDGE ARNOLD: Yes.

5 CHAIR RYERSON: Oh. Well then, Judge  
6 White, do you have questions?

7 ADMIN. JUDGE WHITE: I have no questions.

8 CHAIR RYERSON: Okay. You are excused,  
9 thank you.

10 ADMIN. JUDGE ARNOLD: Mr. Mallon?

11 CHAIR RYERSON: And, again, we remind you  
12 you are still under oath.

13 WITNESS MALLON: Yes, sir.

14 ADMIN. JUDGE ARNOLD: I have just one.  
15 You are familiar with the code?

16 WITNESS MALLON: Yes, sir, I am.

17 ADMIN. JUDGE ARNOLD: You're the person to  
18 be talking to. I just have some questions on the use  
19 of it. Now does the code assume that the plume  
20 remains at the same release height and just travels  
21 with the wind dispersing as it goes?

22 WITNESS MALLON: It's a straight line  
23 Gaussian distribution code and as you move distance  
24 from the emission point to the receptor point the  
25 release disperses uniformly in a X and Z plane, if Y

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1 is the direction towards the receptor.

2 ADMIN. JUDGE ARNOLD: Yes, okay.

3 Concerning the calculation of Chi over D, in modeling  
4 of the topography around the plant are hills, valleys,  
5 and water features at all been included in the model?

6 WITNESS MALLON: For our site it's a  
7 relatively flat area so that would not be a problem  
8 for our location. It would impact other sites  
9 possibly.

10 ADMIN. JUDGE ARNOLD: Now I know you've  
11 got some water and some land around there and I know  
12 as sun strikes water versus land they heat up at  
13 different rates, could that create winds or plumes  
14 that are or are not modeled?

15 WITNESS MALLON: I think that's the driver  
16 for the change in wind direction that the NRC reviewer  
17 spoke about.

18 ADMIN. JUDGE ARNOLD: Okay.

19 WITNESS MALLON: So differential heating.

20 ADMIN. JUDGE ARNOLD: Then, in fact, by  
21 using that distribution of wind you have already  
22 accounted for that?

23 WITNESS MALLON: Yes. That comes into the  
24 annual average then and that's why you want the three  
25 years of data to have a large dataset.

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1 ADMIN. JUDGE ARNOLD: Okay. And his  
2 testimony was the wind in the summer is different from  
3 wind in the winter, so if you did a specific winter  
4 calculation of Chi over D you'd come up with a  
5 different result than a summer Chi over D?

6 WITNESS MALLON: I think you would, yes.

7 ADMIN. JUDGE ARNOLD: Yes, okay. Does the  
8 model use the dispersion account for dropout or  
9 settling of particulate matter?

10 WITNESS MALLON: That would be the D over  
11 Q aspect of it. The Chi over Q would be the purely  
12 gaseous elements.

13 ADMIN. JUDGE ARNOLD: Okay. Well, yes,  
14 and so how are noble gases, other gases, and  
15 particulates treated differently?

16 WITNESS MALLON: And that would be what  
17 you would do with the Chi over Q versus D over Q and  
18 these would inputs to other dose calculational models  
19 that would consider all pathways, so grazing cattle,  
20 corn, and then ultimately the ingestion by a human.

21 ADMIN. JUDGE ARNOLD: In your answer to  
22 Question 15 you mentioned default half-life decay  
23 periods of 2.26 and eight days and I'm just wondering  
24 can two half-lives adequately represent the range of  
25 half-lives of the nuclides in a release?

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1                   WITNESS MALLON:  When we're talking for  
2                   the -- This purpose, this code, is used for longer  
3                   term releases and it would be for the exposure of  
4                   populations near the plant to a chronic exposure via  
5                   ingestion pathways.

6                   So a longer time period would be relevant,  
7                   a short-lived code and accident-type analysis where  
8                   you might have short-lived noble gases or iodine-131  
9                   would be different.

10                   Iodine-131 has an 8-day half-life and  
11                   that's why you have the 8-day one there.  So the  
12                   scenario is that it is chronic exposure, long-term  
13                   exposure.  Longer term half-lives would be relevant to  
14                   the downstream dose analysis.

15                   ADMIN. JUDGE ARNOLD:  Okay.  Do using the  
16                   two half-lives result in a conservative result or is  
17                   it supposed to be a --

18                   WITNESS MALLON:  I think it's  
19                   conservative.

20                   ADMIN. JUDGE ARNOLD:  Okay.  Thank you,  
21                   that's all I have.

22                   WITNESS MALLON:  Sure.

23                   CHAIR RYERSON:  Thank you, Judge Arnold.  
24                   Judge White, did you have questions on this topic?

25                   ADMIN. JUDGE WHITE:  No.

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1 CHAIR RYERSON: Thank you. We now move  
2 into the topics that pertain to the Final  
3 Environmental Impact Statement.

4 And as we have previously indicated on  
5 some of these we will not have oral questions. Again,  
6 I want to emphasize we have substantial pre-filed  
7 written testimony under oath on all these topics.

8 So it doesn't mean that we are not  
9 considering them, but we have been satisfied that we  
10 don't need to ask additional oral questions.

11 So the first topic on which we have no  
12 questions is FEIS-1, which deals with potential impact  
13 on the bog turtle. FEIS-2 on which we have no oral  
14 questions deals with the potential impact on the  
15 eastern tiger salamander.

16 And FEIS-3 on which we do have some  
17 questions deals with the possibility of augmenting the  
18 flow of the Delaware River from water resources in  
19 Merrill Creek, and I believe Judge Arnold is going to  
20 begin on that topic.

21 ADMIN. JUDGE ARNOLD: Yes. And, actually,  
22 I am going to ask Mr. Mallon to come on back.

23 ADMIN. JUDGE ARNOLD: And you're back and  
24 you are still under oath.

25 WITNESS MALLON: Yes.

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1 ADMIN. JUDGE ARNOLD: In your opinion is  
2 there a good reason for mentioning Merrill Creek in  
3 your impact statement and if so what is that reason?

4 WITNESS MALLON: That's an interesting  
5 question and I will say I think we probably might have  
6 confused the record because I think the Merrill Creek  
7 and its possible impact on future nuclear operations,  
8 we have a number of different ways to mitigate that  
9 and while we wanted to be truthful and put everything  
10 out there I think there is a lot of reasons why this  
11 will not be a hindrance to us moving forward if we  
12 choose to build a nuclear plant.

13 ADMIN. JUDGE ARNOLD: My understanding is  
14 the purpose of the Merrill Creek Reservoir is to  
15 control the salt line of the Delaware River during a  
16 period of drought, is that right?

17 WITNESS MALLON: That's correct.

18 ADMIN. JUDGE ARNOLD: Now without  
19 reservoir flow the salt line moves upstream during a  
20 drought, correct?

21 WITNESS MALLON: That's correct.

22 ADMIN. JUDGE ARNOLD: And the major reason  
23 for this would be because there is less freshwater  
24 flowing downstream to keep the salt away.

25 Now the reduction in freshwater flow, can

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1 that be attributed in any way, shape, or form to the  
2 operation of a nuclear power plant on Artificial  
3 Island?

4 WITNESS MALLON: We are south of the salt  
5 line so I think we would be pulling the salt line  
6 South. However, when we went into the DRBC docket and  
7 we entered the agreement to create Merrill Creek they  
8 wanted us to have a fresh water allocation.

9 So for our operations they assume that 18  
10 gallons out of 100, or 18 percent, of our cooling  
11 water is freshwater, so they assume an impact.

12 ADMIN. JUDGE ARNOLD: Well impractical  
13 purposes, does withdrawing water from the river at  
14 Artificial Island really affect the tidal flow that is  
15 occurring up at the salt line?

16 WITNESS MALLON: We're -- No. I mean the  
17 velocities of water, the mass of water, 400,000 to  
18 470,000 cubic feet for second is the tidal flow at our  
19 site. We are not having a significant impact on that  
20 tidal force.

21 ADMIN. JUDGE ARNOLD: In, let's see,  
22 answer to Question 24 in your testimony states "As  
23 part of the DRBC process PSEG would be required to  
24 either hold the specific required Merrill Creek water  
25 allocation or would be required to commit to an

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1 operating plan that would be put into effect for times  
2 of declared of drought warnings or emergencies where  
3 freshwater flow augmentation discharges from the  
4 Merrill Creek Reservoir would be mandated."

5 "As noted above this could include power  
6 generation limits on the new plant or any of the other  
7 plants where PSEG owns water allocations." Now let me  
8 ask you, would reducing power at a new plant affect  
9 the salt line during a drought?

10 WITNESS MALLON: Well I need to make a  
11 distinction between the DRBC docket, and they are  
12 charged with managing the Delaware Water Watershed and  
13 maybe what I think reality is at our location, so  
14 compliance here would mandate.

15 If they ordered us to downpower we would  
16 have to downpower. We also own the Merrill Creek  
17 Power Plant, which is up near Trenton, and that is  
18 purely withdrawing freshwater.

19 So that is an opportunity for us to  
20 downpower Merrill Creek, and because that's a 100  
21 percent freshwater a downpower there in megawatt terms  
22 would be small and allow us at 18 percent to keep  
23 operating.

24 This answer also assumes that the DRBC  
25 docket for a new plant would be exactly like it is

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1 currently for Salem and Hope Creek.

2 ADMIN. JUDGE ARNOLD: Yes, but to ask my  
3 question again, downpowering a new plant on Artificial  
4 Island, would that have any effect on the salt line?

5 WITNESS MALLON: I don't think it would,  
6 but that's my opinion as opposed to compliance.

7 ADMIN. JUDGE ARNOLD: Okay. Okay, does  
8 the PSEG ownership of part of the Merrill Creek  
9 Reservoir redress some specific environmental damage  
10 caused by operation of a nuclear power plant on  
11 Artificial Island, or is it more of a contractual  
12 agreement between PSEG and some other regulatory  
13 environment to control the salt line?

14 WITNESS MALLON: The latter.

15 ADMIN. JUDGE ARNOLD: Okay. On Page 4 of  
16 your written testimony you state "The Merrill Creek  
17 Reservoir allows certain power plants classified by  
18 the DRBC as designated units to continue to withdraw  
19 water from the Delaware River for power generation  
20 during declared drought warnings or emergencies."

21 That seems to really be addressing more of  
22 any plant you have upstream of the salt line rather  
23 than a plant at Artificial Island, correct?

24 WITNESS MALLON: They had all the plants  
25 be signatories to be enabled to run in a drought

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1 emergency, so that's how they defined the designated  
2 units.

3 We did go back out since this testimony  
4 and eight of the plants that were designated units  
5 have since been retired, so it would seem that there  
6 would be water allocation rights available.

7 ADMIN. JUDGE ARNOLD: Okay. That's the  
8 end of my questions for you.

9 WITNESS MALLON: Thank you.

10 CHAIR RYERSON: Just to clarify, when we  
11 are talking about the salt line Artificial Island is  
12 south of the salt line --

13 WITNESS MALLON: That's correct.

14 CHAIR RYERSON: -- so your existing  
15 nuclear facilities, PSEG's nuclear facilities are  
16 cooling with salty or brackish water right now and a  
17 new reactor would be using that.

18 WITNESS MALLON: That's correct.

19 CHAIR RYERSON: So the significance of the  
20 salt line in what's essentially an estuary, a river  
21 flowing into an estuary, is that if it proceeded too  
22 far North then folks in Philadelphia might start  
23 getting concerned that their water supply was brackish  
24 or salty, but it does not really directly affect the  
25 operations of your reactors physically.

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1 WITNESS MALLON: That's correct.

2 CHAIR RYERSON: You might be subject to  
3 conditions that were imposed because of concerns about  
4 the flow or the saltiness, but it does not directly  
5 affect the reactor, yes.

6 WITNESS MALLON: That's correct.

7 ADMIN. JUDGE ARNOLD: One last question.  
8 Then you might say that Merrill Creek Reservoir  
9 operation is more an environmental impact of an  
10 agreement between you and someone else as opposed to  
11 being an environmental impact of the new nuclear power  
12 plant?

13 WITNESS MALLON: I agree with that.

14 ADMIN. JUDGE ARNOLD: Thank you.

15 CHAIR RYERSON: Judge White?

16 ADMIN. JUDGE WHITE: Nothing.

17 CHAIR RYERSON: Thank you.

18 MR. BURDICK: Judge Ryerson, just to --  
19 This is Stephen Burdick, counsel for PSEG. Just so  
20 the record is clear I believe Mr. Mallon twice  
21 mentioned the Merrill Creek Power Plant, I believe he  
22 was referring to the Mercer Power Plant.

23 WITNESS MALLON: Thank you.

24 CHAIR RYERSON: Okay. Thank you for that  
25 clarification. Did you have questions --

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1 ADMIN. JUDGE ARNOLD: I do have some  
2 questions for staff, Philip Meyer and Mohammad Haque.

3 MR. ROACH: Judge Arnold, Kevin Roach, it  
4 will just be Mr. Haque testifying today.

5 ADMIN. JUDGE ARNOLD: Oh.

6 CHAIR RYERSON: Thank you, sir. And if  
7 you would repeat your full name and you are under  
8 oath.

9 WHEREUPON,

10 MOHAMMAD HAQUE

11 was called as a witness and, having been first duly  
12 sworn, was examined and testified as follows:

13 WITNESS HAQUE: My name is Mohammad Haque  
14 and I have been sworn in.

15 ADMIN. JUDGE ARNOLD: In your answer to  
16 Question 4 of your testimony you mention "equivalent  
17 freshwater consumptive use." Could you explain what  
18 exactly is meant by that expression?

19 WITNESS HAQUE: Yes, sure. DRBC requires  
20 that the consumptive use by a utility should be  
21 compensated for low flow augmentation and what they  
22 use is that they have an equivalent factor of 0.18  
23 that has been established by DRBC to compute  
24 equivalent amount for the brackish water.

25 So in this case for PSEG that they would

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1 be using salty water. Now in order to compute the  
2 equivalency of that that amount will be multiplied by  
3 0.18.

4 So to give you an example, that if they  
5 are using 100 acre-feet, for example, just to, this is  
6 just, I am making up a number, 100 acre-feet, if they  
7 are using they would be asked or they would be  
8 required to release only 18 acre-feet.

9 So that is the equivalency factor of 0.18  
10 that has been established by DRBC.

11 ADMIN. JUDGE ARNOLD: Okay. And there are  
12 similar factors for the Salem and Hope Creek Plants?

13 WITNESS HAQUE: That is the same.

14 ADMIN. JUDGE ARNOLD: Okay. Now if Salem  
15 and Hope Creek Plants stopped operating would that  
16 mean there would be more freshwater available?

17 WITNESS HAQUE: They are also using salty  
18 water because they are also at the same location. So  
19 all they use at PSEG is heading for Salem Generating  
20 Station and Hope Creek is also salty water, the same  
21 kind of water that they are proposing to use for the  
22 new nuclear plant.

23 ADMIN. JUDGE ARNOLD: All right. I guess  
24 I am just confused because it seems to me the water is  
25 so well mixed you can't, you know, tell the molecule

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1 that was fresh from the molecule that came from the  
2 ocean and --

3 WITNESS HAQUE: To explain that, the  
4 Delaware River as it goes up -- To be more specific,  
5 that PSEG's plant is at River Mile 54 approximately  
6 and the DRBC is trying to maintain a saltwater line  
7 somewhere at above 80, 82 or so river mile.

8 So what happens is that when the flow at  
9 Trenton goes below 3000 CFS and some other  
10 calculations that DRBC will do they will require the  
11 release of water from Merrill Creek and the idea is to  
12 push back the salt line to move the moving forward up  
13 so that they will not be affecting the drinking water  
14 source. So that is the concept there.

15 ADMIN. JUDGE ARNOLD: I guess what I am  
16 trying to get at is is there any type of evidence that  
17 the consumption of brackish water, of which part of it  
18 came down the river, in any way really affects the  
19 salt line or is this just a regulatory authority that  
20 needs to control the saltwater and looked around to  
21 see who has the deepest pockets?

22 WITNESS HAQUE: That is really a  
23 regulatory requirement that they have. There could be  
24 other users, there could be other reasons, but they  
25 are trying to maintain that the salt line does not

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1 keep moving up and for that they are requiring all  
2 those users to release water and --

3 ADMIN. JUDGE ARNOLD: What they're really  
4 doing is they want to control the salt line so rather  
5 than billing the people who benefit from that they  
6 bill everyone who gets electric power from PSEG?  
7 Okay, thank you.

8 WITNESS HAQUE: Yes. Thank you.

9 CHAIR RYERSON: Thank you. All right. As  
10 I said we have a few more topics on which we have pre-  
11 filed written testimony that we really will not have  
12 oral questions on, that includes FEIS-4 which deals  
13 with the potential impact of the salt drift on  
14 freshwater wetlands.

15 FEIS-5 deals with possible impact on  
16 wildlife, constructing a second causeway to Artificial  
17 Island. As I indicated earlier today we have decided,  
18 we didn't indicate this earlier, that we really have  
19 no oral questions on the other government that is non-  
20 NRC permits that will be required for the site.

21 And, finally, we have no questions, again,  
22 no oral questions we have, we have the written  
23 testimony on mitigation efforts, which brings us to  
24 the last topic which is FEIS-8, Consideration of  
25 Alternative Sites and Analysis of Cumulative Impacts.

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1           And on this topic we did not require pre-  
2           filed testimony, we just asked that some knowledgeable  
3           individuals be present to answer questions on this  
4           topic. So we can begin I think with Judge Arnold.

5           ADMIN. JUDGE ARNOLD: Yes. Is there a  
6           staff person who can answer questions?

7           CHAIR RYERSON: And if before Judge Arnold  
8           begins his questions I would ask each of you to  
9           identify yourselves and just confirm that you are  
10          still under oath.

11         WHEREUPON,

12                                 ANDREW KUGLER  
13           was called as a witness and, having been first duly  
14           sworn, was examined and testified as follows:

15           WITNESS KUGLER: Yes. My name is Andrew  
16           Kugler, Senior Project Manager in the Office of New  
17           Reactors and I am under oath.

18           CHAIR RYERSON: Thank you.

19         WHEREUPON,

20                                 JACK CUSHING  
21           was called as a witness and, having been first duly  
22           sworn, was examined and testified as follows:

23           WITNESS CUSHING: Jack Cushing. I am a  
24           Senior Project Manager in the Office of New Reactors  
25           and I am under oath.

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1 CHAIR RYERSON: Thank you.

2 ADMIN. JUDGE ARNOLD: Okay. I don't have  
3 much on evaluation of other sites, but I look at  
4 Artificial Island that, you know, a manmade land of  
5 mass that has three units operating on it and I'm  
6 thinking what would you need to have a better site,  
7 and then I read the evaluation of alternate sites and  
8 my impression was these are people with too much time  
9 on my hands.

10 Now was there any way you could have used  
11 the fact that it is practically an ideal site to cut  
12 down on the work you did?

13 WITNESS KUGLER: Well, you know, for the  
14 National Governmental Policy Act the consideration of  
15 alternatives is a key, and so we do tend to go into  
16 great depth to consider what alternatives there may  
17 be.

18 While Artificial Island is a good site  
19 it's not perfect, it has some drawbacks, cultural  
20 resource impacts, things of that nature, and so we  
21 have to consider whether or not there would be an  
22 obviously superior site.

23 I would say it would be difficult to find  
24 a better site, but we do have to look, and so we  
25 considered the sites and all of the sites that we

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1 looked at, the other alternative sites, are places  
2 where you could build a nuclear power plant if you  
3 chose it, but what in the end we concluded was that  
4 none was environmentally preferable to the proposed  
5 site.

6 ADMIN. JUDGE ARNOLD: Okay. Do you think  
7 it was time, effort, well spent?

8 WITNESS KUGLER: I do in the sense that we  
9 need to have taken the hard look that NEPA requires.  
10 While -- Well, I never prejudge a site in the sense  
11 that it may look really good in certain respects, but  
12 we do need to look and see if there is something  
13 clearly better.

14 We didn't find anything clearly better in  
15 this case, but we do always go and look. And there  
16 have been other application in which a nearby existing  
17 nuclear power plant site has not been chosen over a  
18 different site that had other advantages.

19 ADMIN. JUDGE ARNOLD: Okay. The rest of  
20 my questions have to do with cumulative effects and  
21 I'd like to start off asking what is a cumulative  
22 impact?

23 At times like it seems to be everything  
24 that's happened to this land since, you know, the  
25 Pilgrims landed, at other times it seems to be more

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1 focused, so what was your working definition of what  
2 constitutes cumulative?

3 WITNESS CUSHING: Well we use the CEQ  
4 definition of cumulative impact and that's the impact  
5 on the environment which results from the  
6 environmental impact of the action, which in this case  
7 would be building a nuclear plant at Artificial  
8 Island, well added to any of the past, present, or  
9 reasonably future actions, regardless of who takes  
10 them.

11 And what cumulative is looking for is if  
12 are there a lot of individually minor actions that may  
13 not be significant in and of themselves but  
14 collectively could stress the resource.

15 So that's what our definition of  
16 cumulative impact is.

17 ADMIN. JUDGE ARNOLD: Hmm. Now one of the  
18 sources of information I have is my fellow Judges and  
19 I was told that the general concept came about because  
20 of a mining company that wanted to do a massive mine  
21 but chopped it into such small pieces that each one  
22 had minimal impact but when you looked at them all  
23 together there was something significant.

24 Now this is not a case of, you know,  
25 looking at bits and pieces of siting a new reactor,

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1 it's looking at everything that has happened in the  
2 area. Is that a correct view that --

3 WITNESS CUSHING: Well --

4 ADMIN. JUDGE ARNOLD: -- there doesn't  
5 have to be a nexus between the previous action and the  
6 actual Artificial Island work, it just has to be  
7 within that 50 miles radius?

8 WITNESS CUSHING: Well for each resource  
9 area we set up a geographic area of interest. For  
10 like the water resource they use like the Delaware  
11 River Basin for the cumulative impact and there is a  
12 lot of users of that water so they analyze the impact,  
13 the cumulative impacts to the water resource.

14 So we look at what other people are doing  
15 to the resource as well as what this proposed project  
16 would.

17 ADMIN. JUDGE ARNOLD: Okay. For the land  
18 use impact what was the region you used?

19 WITNESS CUSHING: They used a 6-mile  
20 radius, vicinity.

21 ADMIN. JUDGE ARNOLD: Oh, for cumulative  
22 impacts?

23 WITNESS CUSHING: Yes.

24 ADMIN. JUDGE ARNOLD: Ah. I had it in my  
25 mind that you were looking at 50 miles and I couldn't

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1 understand how you got the cumulative impact as  
2 medium, but if you're six miles --

3 WITNESS CUSHING: Well, yes. We do --  
4 Each resource area has a different geographic area of  
5 interest based on what the resource is, so we don't  
6 use just six miles, that may be just for land use, for  
7 water we use, you know, the river basin, and so for  
8 each resource area it's somewhat different.

9 ADMIN. JUDGE ARNOLD: Can you think of any  
10 insights that you got out of assessing the cumulative  
11 impacts that wouldn't have been there without doing  
12 that assessment?

13 WITNESS CUSHING: A lot of -- I know where  
14 the issue is. Like a lot of what when we analyze the  
15 direct and indirect impacts it's very hard to separate  
16 out the past and the present when you are analyzing  
17 say water use because the past and present already  
18 exist in what you are measuring water flow, that type  
19 of thing.

20 So we didn't really get an issue where the  
21 cumulative, the issue was driven by this project that  
22 we didn't get from the direct and indirect in Chapters  
23 4 and 5.

24 ADMIN. JUDGE ARNOLD: Well this is more of  
25 a philosophical question, but currently the FEIS is

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1 2000 pages, right, and I think the first FEIS for a  
2 nuclear power plant was Calvert Cliffs and I don't  
3 think it was quite as large.

4 In fact, I get the impression that they  
5 keep getting bigger and bigger and never get smaller.

6 WITNESS CUSHING: I would say that's a  
7 fairly good characterization that over time they do  
8 get bigger. There is more issues, things with  
9 litigation drive it as well.

10 And so a lot of -- We have to show we took  
11 a hard look and that's, you know, what we are doing in  
12 the EIS.

13 ADMIN. JUDGE ARNOLD: Let's see. Well  
14 since my land use question disappeared I am done with  
15 my questions.

16 CHAIR RYERSON: Thank you, Judge Arnold.  
17 I think, Judge White, you have a question for these  
18 witnesses?

19 ADMIN. JUDGE WHITE: Yes. In your  
20 discussion of cumulative impacts it just came to mind  
21 that I was wondering whether the concept of thresholds  
22 or environmental thresholds comes into this analysis  
23 where does staff in fact look at sort of the  
24 environmental load-bearing capacity and look at all  
25 the other stressors on that environment even if a new

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1 facility has a relatively small increment of addition  
2 to the total, does the staff look at thresholds above  
3 which they do not want that stress to pass?

4 One would come to mind, and we felt we had  
5 good answers to this, but one was, for example, the  
6 salt distribution in the environment. It was  
7 explained that plants, especially in this environment,  
8 can take a certain level of salt distribution and that  
9 salt comes from a variety of other sources, including  
10 just spray off the Bay.

11 But I guess the question, again, just to  
12 repeat, and you probably understand what I'm trying to  
13 get at, does staff actually look at some level and say  
14 above this we cannot go or harm will be done even if  
15 the facility under consideration adds only a small bit  
16 to that if all the other stressors behind that will  
17 cause this small increment to pass a threshold then  
18 that makes the cumulative analysis be a deal breaker?

19 WITNESS CUSHING: Yes, it's essentially  
20 looking at the issue of the individually minor but  
21 collectively significant aspect of cumulative and it  
22 sort of gets to the concept of do you reach like a  
23 tipping point on the resource where adding one more  
24 straw breaks the camel's back.

25 ADMIN. JUDGE WHITE: I got it. That's

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1 what I'm trying to get at.

2 WITNESS CUSHING: All right.

3 ADMIN. JUDGE WHITE: And so you do in fact  
4 look at things from that perspective in this?

5 WITNESS CUSHING: Right. And I say it's  
6 sort of rare that we come to an instance where it  
7 really hits a resource like that, but we do, that's  
8 what part of the purpose of the cumulative analysis  
9 is.

10 ADMIN. JUDGE WHITE: I see. Good, thanks,  
11 that clears that up.

12 CHAIR RYERSON: Judge Arnold?

13 ADMIN. JUDGE ARNOLD: None.

14 CHAIR RYERSON: All right. Thank you,  
15 gentlemen, you may stand down.

16 WITNESS KUGLER: Thank you.

17 WITNESS CUSHING: Thank you.

18 CHAIR RYERSON: All right. At this point,  
19 when we had our last pre-hearing conference by  
20 telephone we left open the question of whether counsel  
21 wanted to make closing statements.

22 I don't think the Board necessarily  
23 requires them -- Well, let me ask. PSEG, do you want  
24 to make a closing statement?

25 MR. BURDICK: We're fine with not having

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1 closing statements.

2 CHAIR RYERSON: You're fine, okay. And,  
3 Mr. Roach?

4 MR. ROACH: The staff would like to make  
5 a few closing remarks, and my colleague, Ann Hove,  
6 will be doing so.

7 CHAIR RYERSON: Excellent. Ms. Hove?

8 MS. HOVE: Yes. My name is Ann Hove,  
9 counsel for the NRC staff. The NRC staff thanks the  
10 Board for the opportunity to give a closing statement.

11 The NRC staff has completed its safety and  
12 environmental reviews and has made all the necessary  
13 regulatory findings required with regard to PSEG's  
14 application for an early site permit.

15 The staff's review for the PSEG ESP  
16 application is documented in the Final Safety  
17 Evaluation Report and in the Final Environmental  
18 Impact Statement.

19 These documents contain the staff's  
20 reasoned bases for its findings required by NEPA and  
21 by the Atomic Energy Act and the applicable Commission  
22 Regulations.

23 In conducting its review the staff  
24 followed the applicable NRC guidance, evaluated the  
25 ESP application in a manner consistent with the review

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1 of previous ESP applications, and incorporated lessons  
2 learned from previous new reactor reviews.

3 The review documents, including permit  
4 conditions identified therein along with the staff's  
5 responses to Board questions, pre-filed written  
6 testimony, and oral testimony given on the record  
7 today, provide a reasoned basis to support the  
8 findings the Board must make in accordance with the  
9 Atomic Energy Act and the applicable Commission  
10 Regulations to support granting the PSEG ESP.

11 Lastly, the NRC staff would like to thank  
12 the ASLBP Board Judges and law clerks for their  
13 efforts in holding this uncontested hearing and also  
14 would like to thank you the court reporter and the  
15 parties for their participation.

16 CHAIR RYERSON: Thank you, Ms. Hove. All  
17 right, just a few housekeeping details before we break  
18 up this morning.

19 We previously agreed, both parties and the  
20 Board on what the issues in the case are. They are  
21 set forth in the Scheduling Order so we really don't  
22 see a need for proposed findings of any kind after the  
23 hearing.

24 In terms of possible transcript  
25 corrections I would like to urge you to consider the

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1 Board's view that minor corrections that have no  
2 substantive impact are not necessary.

3 With that in mind I would suggest that the  
4 parties try to agree upon any necessary transcript  
5 corrections within say ten days of the availability of  
6 the transcript.

7 I think the transcript is probably on a 3-  
8 day turnaround, something like that. Does that seem  
9 reasonable for both parties to get together within ten  
10 days and submit one set of proposed agreed upon  
11 transcript corrections?

12 MR. BURDICK: That's fine for PSEG.

13 MR. ROACH: Yes, for us as well.

14 CHAIR RYERSON: Yes. And, again, really  
15 all we need are -- If a "not" gets dropped out that  
16 ought to be corrected, but otherwise a lot of these  
17 corrections really don't need to be made.

18 Our Scheduling Order contemplates that the  
19 Board will have a written decision by May 13. We  
20 presently anticipate meeting that deadline.

21 I think I would like to reciprocate your  
22 thanks, Ms. Hove, and thank all of the witnesses and  
23 the counsel for their participation today. Your  
24 professionalism makes our job easier.

25 Judge Arnold, any comments at this point?

**NEAL R. GROSS**

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1 ADMIN. JUDGE ARNOLD: No comments.

2 CHAIR RYERSON: Judge White?

3 ADMIN. JUDGE WHITE: No, nothing from  
4 here.

5 CHAIR RYERSON: All right. Well, again,  
6 thank you all and we stand adjourned.

7 (Whereupon, the above-entitled matter went  
8 off the record at 12:09 p.m.)

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