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**STATE OF NEW HAMPSHIRE**

**SITE EVALUATION COMMITTEE**

**April 19, 2017 - 2:20 p.m. DAY 5**  
49 Donovan Street **AFTERNOON SESSION ONLY**  
Concord, New Hampshire

*{Electronically filed with SEC 04-25-17}*

**IN RE: SEC DOCKET NO. 2015-06**  
**NORTHERN PASS TRANSMISSION -**  
**EVERSOURCE; Joint Application of**  
**Northern Pass Transmission LLC and**  
**Public Service of New Hampshire d/b/a**  
**Eversource Energy for a**  
**Certificate of Site and Facility**

**PRESENT FOR SUBCOMMITTEE/SITE EVALUATION COMMITTEE:**

- Chmn. Martin Honigberg** Public Utilities Comm.  
*(Presiding Officer)*
- Cmsr. Kathryn M. Bailey** Public Utilities Comm.  
**Dir. Christopher Way, Des.** Dept. of Resources &  
Economic Development
- Craig Wright, Designee** Dept. of Environmental  
Services
- William Oldenburg, Des.** Department of  
Transportation
- Rachel Whitaker** Alternate Public Member

**ALSO PRESENT FOR THE SEC:**

- Michael J. Iacopino, Esq. Counsel to the SEC
- Iryna Dore, Esq.  
*(Brennan, Caron, Lenehan & Iacopino)*
- Pamela G. Monroe, SEC Administrator

***(Appearances not taken)***

**COURT REPORTER: Cynthia Foster, LCR No. 14**

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**P R O C E E D I N G S****WITNESS PANEL****WILLIAM BAILEY****GARY JOHNSON****DOUG BELL***(Resumed)*

PRESIDING OFFICER HONIGBERG: I believe,  
Mr. Walker, you have the microphone.

MR. WALKER: Thank you, Mr. Chairman.

**REDIRECT EXAMINATION****BY MR. WALKER:**

Q Mr. Bell, I'm going to start with you.

Yesterday Attorney Whitley was asking you some questions with regard to the monitoring done around the Deerfield substation. Do you recall those questions?

A (Bell) I do.

Q And I want to refer you to the page 170. I'm sorry. Figure 1 from Sound Report 3. And Dawn, if you could put that up, please?

Do you have that figure in front of you, Mr. Bell?

A (Bell) I do see it, yes.

Q What does that figure depict?

A (Bell) Those are the measurement locations of sound monitoring we conducted in the vicinity of the Deerfield expansion project.

1 Q What were you trying to accomplish with  
2 monitoring around the Deerfield project?

3 A (Bell) The objective of the sound monitoring for  
4 these points was to establish lowest background  
5 noise levels that residences would be exposed  
6 to, and those levels, once you've established  
7 them, become the basis of then establishing  
8 design goals, acoustic design goals, for the  
9 project such that the acoustic design goals are  
10 set such as their additive effect would be, have  
11 little or no impact on the acoustic environment.

12 Q I think Mr. Whitley or Attorney Whitley was  
13 asking you yesterday why didn't you choose to  
14 monitor right at the property boundary of the  
15 substation.

16 A (Bell) Well, although that sounds like it might  
17 be intuitively the right thing to do, it's  
18 exactly the opposite of what you're interested  
19 in achieving for this project. The goal here is  
20 not to see and to establish sound levels that  
21 are in proximity of the substation but actually  
22 sound levels where receptors are. The farther  
23 you get way from the substation, its sound  
24 levels and sound impacts are lower. This then

1 establishes lower acoustic design goals for the  
2 entire project.

3 Q Thank you. And this morning, Ms. Bradbury was  
4 asking you about sound mitigation measures for  
5 the Deerfield substation. In particular, she  
6 was asking you about the design plans, and you  
7 mentioned that the design plans have not been  
8 finalized; do you recall that?

9 A (Bell) I do.

10 Q So although you do not know the final design  
11 details for the substation, can you still opine  
12 that the expansion will not present any concerns  
13 for human health and safety from a sound  
14 perspective?

15 A (Bell) I can. And the reason for this is we set  
16 a very low acoustic design goal which will have  
17 to be achieved by the design of the facility as  
18 to how that and what process is used to design  
19 the facility to meet that goal. Doesn't  
20 necessarily matter to me in that respect as to  
21 the means that they get there. It's just that  
22 they achieve the goal such that and if they  
23 achieve the goal, I have no concerns with  
24 respect to public health and safety.

1 Q So. In other words, you don't need to  
2 understand all of the details as to what they're  
3 going to do so look as they meet their goal that  
4 you set.

5 A (Bell) That's correct.

6 Q You were also asked a number of questions today  
7 and yesterday about the construction noise and  
8 both the underground and the aboveground  
9 sections of the project. In your opinion, do  
10 the likely construction noises from this project  
11 present any concern for human health and safety?

12 A (Bell) No.

13 Q Thank you. Next, Mr. Johnson. This morning you  
14 were asked by Mr. Wright generally about the EMF  
15 modeling that you performed for this project.  
16 Do you recall those questions that came to you  
17 this morning?

18 A (Johnson) Yes, I do.

19 Q Have you used generally the same EMF modeling in  
20 prior transmission line projects that you used  
21 for this project?

22 A (Johnson) Yes. As I indicated, I've used the  
23 models used for this project in several other  
24 projects that I've been involved in.

1 Q Have you had the opportunity to perform EMF  
2 modeling for other transmission line projects  
3 and then also compare that to measured results?

4 A (Johnson) I've had the opportunity, yes, to do  
5 calculations for particular line designs and  
6 then also had the opportunity to make  
7 measurements under those lines that I've modeled  
8 and compare basically the measurements with the  
9 modeling, and there's been very good agreement.

10 Q So how often have you done that? How often have  
11 you had the opportunity to do that?

12 A (Johnson) Tens of projects. Well, actually tens  
13 of projects and even numerous line designs  
14 beyond just specific projects.

15 Q Based on that experience, how confident are you  
16 in the accuracy of your modeling for this  
17 project?

18 A (Johnson) Quite confident in the model that  
19 given the information for the inputs and that's  
20 what you're out there measuring and that's what  
21 you're going to get.

22 Q Okay. Thank you, Dr. Johnson.

23 Lastly, Dr. Bailey. Yesterday there was  
24 considerable discussion by you and Dr. Johnson

1 about what you described as the reference levels  
2 as well as the basic restrictions, and I think  
3 you were referring to the ICNIRP standards. Do  
4 you recall those questions and answers?

5 A (Bailey) I do.

6 Q And this is with regard to EMF fields, correct?

7 A (Bailey) Yes.

8 Q Could you just generally describe the difference  
9 between a reference level and a basic  
10 restriction as set forth by ICNIRP and ICES?

11 A (Bailey) Okay. Both of these organizations set  
12 a standard for the upper limit to the electric  
13 field that would be produced in tissues of the  
14 body. And so the limits vary somewhat depending  
15 upon whether it's the head or the limb, but the  
16 lowest limits are in the head. On the brain.  
17 And we, obviously, can't measure these electric  
18 fields in tissues of the body, and so we have to  
19 have a way to determine what levels of exposure  
20 would lead or produce those electric fields  
21 induced in tissues. And that is the whole goal  
22 of dosimetry modeling.

23 So when the standard was set, the limit in  
24 the standard is this internal electric field



1 value. And then having determined that value  
2 that should not be exceeded, then the  
3 organization set varying levels of exposure that  
4 would keep the induced electric field in tissues  
5 below that limit. So in the people that we're  
6 referring to, it had the calculated values of  
7 the electric field at the edge of the  
8 right-of-way on maximum on the right-of-way and  
9 in several cross-sections --

10 Q Let me interrupt you, Dr. Bailey, and let me  
11 just pull up that table.

12 Dawn, if you wouldn't mind pulling up Table  
13 15 which I think you're referring to. And Dawn,  
14 if you could blow that up a bit so it's more  
15 legible.

16 A So here we have at the top of the table under AC  
17 electric field, kV per meter, it has columns  
18 under ICNIRP and ICES, and the limit that is  
19 specified, for instance, for ICNIRP at 60 hertz  
20 is 4.2 kV per meter which is the reference  
21 value. That is a value that no matter what the  
22 circumstances are of the exposure conditions, a  
23 person going out and taking a measurement would  
24 be guaranteed under all circumstances to have an

1 exposure that would be compliant with the  
2 standard.

3 The standards also allow high exposures to  
4 higher levels than the reference levels if  
5 through computational modeling you can  
6 demonstrate that the underlying limit or basic  
7 restriction has not been exceeded.

8 So for reference, we included here beneath  
9 the 4.2 kV per meter the electric field exposure  
10 that is calculated to produce an internal  
11 electric field equal to the standard or the  
12 limit which is 36.4 kV per meter. So this means  
13 that unless the exposure on the transmission  
14 line right-of-way exceeded 36.4 kV per meter,  
15 that the ICNIRP limit, the biologically based  
16 limit, would not be exceeded.

17 Similarly, if you go to the ICES guideline,  
18 the reference value is 5 kV per meter, and that  
19 assures that under any exposure circumstances,  
20 you would always comply with the underlying  
21 biological limit, and here we have calculated  
22 what is the electric field exposure that would  
23 equal the ICES limit and that is 26.8 kV per  
24 meter. So it's slightly lower value than the

1 ICNIRP.

2 So this means that even though in the  
3 Section S1-12, it looks like, and 16, and 19,  
4 and 20, even though the calculated electric  
5 field on the right-of-way is just a hair above  
6 the ICES reference value of 5, or above the  
7 ICNIRP value of 4.2 as reference values, in  
8 those cases and none of the other cases do the  
9 calculated electric fields get anywhere close to  
10 the level of exposure that would equal the basic  
11 restriction or the limit.

12 So it's a long complicated way of saying  
13 that the values here that were calculated by  
14 Dr. Johnson are all compliant with the  
15 underlying limit that has been promulgated by  
16 ICES and ICNIRP.

17 Q Thank you. So in any of those segments on this  
18 table, do any of the values shown here either at  
19 the edge of the right-of-way or within the  
20 right-of-way, are they likely to cause any  
21 adverse effects to human health?

22 A (Bailey) No. And from the discussion this  
23 morning when I mentioned what the limits were  
24 from various states for the maximum allowable

1 levels of electric fields on the right-of-way,  
2 those maximum allowable electric limits are all  
3 greater than the highest values which are seen  
4 here.

5 Q Jumping to another subject here, you had a lot  
6 of excerpts read to you by both Attorney Roth as  
7 well as Ms. Quinn this morning with regard to  
8 general information about EMF. Based on your  
9 experience and knowledge, do any of the excerpts  
10 that were read to you change your opinion in  
11 this case that this project will not have any  
12 adverse effect on human health?

13 A (Bailey) None of them did.

14 Q Thank you. Nothing further. Thank you.

15 PRESIDING OFFICER HONIGBERG: All right.  
16 And if there's nothing else for this panel, they  
17 can be excused. Thank you.

18 Mr. Needleman.

19 MR. NEEDLEMAN: We'll ask Mr. Andrew to  
20 finally come up here.

21 **(Whereupon, Robert Andrew was duly sworn**  
22 **by the Court Reporter.)**

23 PRESIDING OFFICER HONIGBERG: Mr.  
24 Needleman, you may proceed.

1 MR. NEEDLEMAN: Thank you.

2 **DIRECT EXAMINATION**

3 **BY MR. NEEDLEMAN:**

4 Q Could you please give us your name and your  
5 business title?

6 A Yes. Well, my name is Robert Andrew. I go by  
7 Bob. I'm Director of System Solutions for  
8 Eversource Energy.

9 Q And Mr. Andrew, just briefly, what's your role  
10 in this case?

11 A Well, my role is to, I guess, adopt the  
12 submittal testimony by Mr. Brad Bentley and to  
13 modify it for some of the things that have taken  
14 place in relation to the work that has been done  
15 with ISO New England to show that this project  
16 has no adverse impact on the New England  
17 transmission system.

18 Q So I've given you three exhibits. Applicant's  
19 Exhibit 4 is the Prefiled Testimony of Brad  
20 Bentley. Applicant's Exhibit 68 is an August  
21 4th, 2016, letter from our law firm to Ms.  
22 Monroe indicating that you would adopt that  
23 testimony. And then Applicant's Exhibit 32 is  
24 your Substitute Prefiled Direct Testimony and

1 Supplemental Testimony. Do you have those  
2 exhibits up there?

3 A Yes. I do.

4 Q So turning your attention to Exhibit 4 which is  
5 Brad Bentley's Prefiled Testimony which you're  
6 adopting, do you have any corrections or changes  
7 to that testimony?

8 A Well, there are some updates and changes to that  
9 that are given in Exhibit 32. Do you want me to  
10 explain those changes?

11 Q I don't think we need to run through them as  
12 long as it's captured in 32 and there's nothing  
13 new. That's fine.

14 A There's nothing beyond that.

15 Q And then also with respect to Exhibit 32 which  
16 is your Supplemental Testimony and Adopted  
17 Testimony, do you have any changes to that  
18 document?

19 A No, I do not.

20 Q Right. So that being the case, do you adopt  
21 both Exhibit 4 and Exhibit 32 as your testimony  
22 and swear to it?

23 A Yes. I do.

24 PRESIDING OFFICER HONIGBERG: Mr.

1 Needleman, I have a question.

2 MR. NEEDLEMAN: Sure.

3 PRESIDING OFFICER HONIGBERG: Is everything  
4 that's in 32 also in 4?

5 MR. NEEDLEMAN: Yes. So I should probably  
6 let Mr. Andrew answer this, but what we did is  
7 we, in Exhibit 32, we pulled forward everything  
8 that was in 4, made a couple of corrections to  
9 what was in 4, and then added a couple of  
10 things.

11 PRESIDING OFFICER HONIGBERG: Does 4 still  
12 have an independent life? Is it still relevant  
13 in any way?

14 MR. NEEDLEMAN: Probably not. But just to  
15 be complete, we included it.

16 PRESIDING OFFICER HONIGBERG: I guess then  
17 when we're done with all the proceedings and  
18 we're deciding what's going to become full  
19 exhibits and what's going to become part of that  
20 official record, maybe some judgment call can be  
21 made about whether 4 still has any vitality.

22 MR. NEEDLEMAN: Sure. I think if we get to  
23 the end of this part of the process and there's  
24 nobody who thinks it does, we can set it aside.





1 Q And that would necessarily include the Coos Loop  
2 upgrades, correct?

3 A Yes.

4 Q And there is something called an I.3.9?

5 A Yes.

6 Q Can you explain to the Committee briefly what  
7 that is?

8 A Sure. The I.3.9 is actually the chapter of the  
9 ISO New England Tariff that covers the process  
10 that needs to be followed for approval of  
11 projects to change the electric transmission  
12 system.

13 Q And there is attached to your Exhibit 32, your  
14 Supplemental Testimony, Attachment B is a July  
15 19th, 2016, ISO New England letter, and that is  
16 concerning Proposed Plan Applications and the  
17 designation of ES-16-T31 through T37. Correct?

18 A That's correct.

19 Q And those are the Applications that would  
20 necessarily include the Coos Loop improvements?

21 A No.

22 Q Is there another Application?

23 A The existing I.3.9s that are approved cover  
24 changes to the Loop necessary to support the

1 construction of Northern Pass. In our past  
2 conversations, your concern has been about  
3 opening the capacity of the Loop to export more  
4 power. The additional work that needs to be  
5 done to do that is the reconductoring of two  
6 more small sections of the transmission line,  
7 and then probably the addition of some sort of  
8 voltage support device somewhere on the Loop.  
9 And those scopes are not included in those I.3.9  
10 approvals.

11 Q Have I.3.9 applications been prepared for those  
12 improvements?

13 A Not yet. No.

14 Q And when will those be prepared?

15 A Well, I imagine with the commitments that  
16 Mr. Quinlan made earlier in these hearings, with  
17 approval to start construction on the project,  
18 we would then start the studies and the approval  
19 process with the ISO to make those changes.

20 Q And how long does that approval process take  
21 from the time you start the preparation of the  
22 application to the time it's approved?

23 A The reconductoring of the line segments I spoke  
24 of earlier would be what's considered a Level 1

1 Application, and three months is a very  
2 reasonable time to get through the preparation  
3 and the formal approval from the ISO for that.

4 The study of the voltage support device,  
5 let's say, and that approval would probably take  
6 4 to 6 months.

7 Q Okay. And the voltage support device has been  
8 referenced earlier as a SVC static bar?

9 A I think that's been an assumption that that  
10 would be the optimum technology, but we would  
11 look at devices called STATCOMs, SVC,  
12 synchronous condenser, and even potential a lot  
13 of people suggest that batteries can do that for  
14 you, but we would look at the different  
15 technologies and pick the one that's best to  
16 address the situation at hand.

17 Q But, again, that would all be part of the  
18 process of approval, condition of the approval  
19 here at the Committee and then going forward for  
20 installation as part of the upgrades, correct?

21 A That, I don't know the full details of what  
22 would come out, but we would follow whatever  
23 instructions and direction we were given.

24 Q Now, part of your job description I believe you

1 testified earlier was that you track retirements  
2 of generating facilities; is that correct?

3 A Well, we're aware of them. Generating  
4 facilities that wish to retire do it through ISO  
5 New England. They control the generation market  
6 in its entirety. So we're aware when units  
7 formally submit to retire. Yes.

8 Q And are you aware of any planned retirements of  
9 any of the generating facilities in Coos County?

10 A I'm not aware of any, no.

11 Q Are you aware of any implied concerns of  
12 generators being forced to retire as a result of  
13 Northern Pass coming on line?

14 A Of Northern Pass coming on line? No. I'm not.

15 Q Any other factors with your qualifier?

16 A No. I mean, the biggest factor that I've heard  
17 discussed in any other previous retirements is  
18 always the ability to make a profit. I know the  
19 Pilgrim Nuclear Power Plant is retiring shortly,  
20 and that was one of their chief concerns was  
21 that they could no longer do it in a manner to  
22 make money and so they were leaving the  
23 business.

24 Q Let's turn to the level of maintenance required

1 by ISO New England or even FERC under the  
2 National Electric Safety Code for these types of  
3 transmission lines. Am I correct to assume that  
4 because they are the high voltage lines, they  
5 truly have to be maintained at 100 percent of  
6 their functional capacity, correct?

7 A Yes. I mean, I think part of it is we routinely  
8 look at the structures that hold the lines up.  
9 There's about an 8-year interval where we  
10 physically will test wooden poles. We do visual  
11 inspections for insulator integrity, static wire  
12 integrity, the phase wires themselves, lightning  
13 can cause damage, things of this nature. So  
14 it's a continuing process where we're looking  
15 for damage, and when we know it's there, we fix  
16 it.

17 Q And it's that continuing process that ISO and  
18 FERC require you to do so that the asset is not  
19 at 50 percent of its ability to carry power.  
20 It's maintained as close to 100 percent as  
21 reasonably prudent can be, correct?

22 A Yes. If we have something wrong, damage to a  
23 disconnect or something where we look at that  
24 and derate the facility, then pretty much it's a

1 matter at that point that we're trying to get  
2 the parts, the people, and maybe the outages.  
3 Depending on other work that's in an area, that  
4 may be a difficult outage to get. But yes, we  
5 restore it to full capacity as soon as is  
6 reasonably practical.

7 Q Thank you. One final question. One of the  
8 phrases used in the Application is this upgrade  
9 to the Coos Loop is intended to unlock up to 100  
10 megawatts of renewable energy, and I'm wanting  
11 to ask you if you know what the floor beneath  
12 the "up to" would be. Is it intended to do at  
13 least X?

14 A Well, I guess the best way to describe it is the  
15 existing Loop has two sets of circumstances that  
16 can limit the amount of power that can be  
17 exported. One is what we'll call a thermal  
18 limitation where if load is light, and  
19 generation is heavy, and the wrong line trips,  
20 the remaining line is overloaded and can  
21 physically burn down. That thermal limitation  
22 is what will be fixed by the reconductoring  
23 efforts. The combined efforts.

24 The other limitation that takes place is

1           that because it's a Loop, normally flows split  
2           around the Loop back to Whitefield where the  
3           Loop ties to the rest of the system.  If you  
4           lose one side, everything gets rerouted the  
5           other way.  The result can be under heavy power  
6           flow situations a large voltage drop when that  
7           happens.  That voltage drop can be a shock to  
8           generators that are on line at that point and  
9           cause them to trip.  So, roughly speaking,  
10          that's one of the voltage kind of problem that  
11          we would be fixing.

12        Q     In that latter situation, is that what the SVC  
13           or some other device is intended to remedy?

14        A     Yes.

15        Q     Thank you very much.

16                   MR. BOLDT:  I pass the witness,  
17           Mr. Chairman.

18                   PRESIDING OFFICER HONIGBERG:  Anyone from  
19           Wagner Forest Management to ask questions?  I  
20           thought not.  Mr. Pappas?

21                                   **CROSS-EXAMINATION**

22        **BY MR. PAPPAS:**

23        Q     Good afternoon, Mr. Andrew.  We met before.  I'm  
24           Tom Pappas, and I represent Counsel for the

1 Public.

2 I just want to step back a little bit and  
3 ask you about your involvement in the Northern  
4 Pass project. Okay?

5 So as I understand it, you had been  
6 Director of System Solutions since January of  
7 this year, is that correct?

8 A That's correct.

9 Q And before that, you were Director of System  
10 Planning from 2010 to December of last year?

11 A Correct.

12 Q And if you look at your resume, both positions  
13 have identical responsibilities?

14 A Yes, but the second title sounds much nicer than  
15 the first one.

16 Q Absolutely. You're now solving things, not just  
17 planning for them.

18 A Right.

19 Q Got it. As I understand it, when you were  
20 Director of Planning for NorthStar, Mr. Bentley  
21 whose testimony you adopted was Director of  
22 Planning for Northeast Utilities?

23 A Yes.

24 Q And when Northeast Utilities and NorthStar



1 merged, you and Mr. Bentley split up,  
2 essentially, territories?

3 A Correct.

4 Q And at that point, you became responsible for  
5 New Hampshire and eastern Massachusetts?

6 A Correct.

7 Q But at that time, Mr. Bentley had already been  
8 working on the Northern Pass project; is that  
9 right?

10 A That's correct.

11 Q So he continued with the Northern Pass Project  
12 until he left the company?

13 A Yes.

14 Q And as I understand it, he left in April of  
15 2016?

16 A Yes.

17 Q So you became involved in the Northern Pass  
18 project beginning in April of 2016; is that  
19 right?

20 A Well, let's say, the way we do planning in New  
21 England, when any I.3.9 study is done it goes  
22 through two task forces at ISO New England, the  
23 transmission task force and the stability task  
24 force, and all the different transmission owners

1 in New England have technical representatives on  
2 these task forces. So that the studies that  
3 were done, while Mr. Bentley had the lead for  
4 performing them and the day-to-day review, when  
5 the studies are complete, they came through my  
6 staff as part of that transmission task force  
7 and stability task force reviews.

8 Q But you personally weren't involved in reviewing  
9 them, were you?

10 A That's correct.

11 Q And you mentioned a moment ago the ISO New  
12 England I.3.9 Tariff. As I understand it,  
13 specifically what that looks at is whether  
14 Northern Pass will adversely impact the New  
15 England grid stability or reliability. Is that  
16 the focus of it?

17 A Yes. The key term is "significant adverse  
18 impact."

19 Q Essentially, ISO New England wants to know that  
20 in laymen's terms if Northern Pass connects to  
21 the grid, it's not going to upset the other  
22 transmission systems in the grid.

23 A Correct.

24 Q Now, as part of that process, I understand that

1 something called a Proposed Plan Application is  
2 submitted to ISO New England, is that right?

3 A That's correct.

4 Q And not to be confused with another PPA, but  
5 it's referred to as a PPA, correct?

6 A Yes. And it is a point of confusion a lot.

7 Q I'm sure it is. And as I understand it, there  
8 are certain data that's collected, there's some  
9 studies done, it's submitted to ISO New England,  
10 they do some additional studies, and then it  
11 goes in front of a committee to be voted upon  
12 essentially?

13 A Correct.

14 Q So let me just review with you briefly what  
15 Northern Pass has done to get to the point we  
16 are today. Now, as I understand it, the first  
17 PPA that was submitted was in the fall of 2013.  
18 Is that right?

19 A That's correct.

20 Q And what's on the screen now is Exhibit 65 which  
21 is the 12/31/13 approval letter for that first  
22 PPA for Northern Pass, correct?

23 A Correct.

24 Q And Attorney Boldt asked you about the -- if you

1 look at the "re" line, it has the NU13, T20 and  
2 so forth. Could you just explain to the  
3 Committee what those represent?

4 A Okay. That is ISO New England's numbering  
5 system. NU stands for Northeast Utilities, 13  
6 is the calendar year in which the Applicant  
7 first went to the ISO, T stands for  
8 transmission, and then the 20 odd numbers are  
9 just sequential numbers assigned to each  
10 project.

11 Q Well, for instance, T20. Would that be a  
12 section of the Northern Pass project?

13 A Yes, in that we'd have to actually have that PPA  
14 in front, but it would describe the changes to  
15 the electric transmission system that are part  
16 of that scope of work.

17 Q Okay. For instance, the changes to the  
18 Deerfield substation would probably be one of  
19 these, correct?

20 A Correct.

21 Q And the Franklin converter station would be  
22 another one?

23 A Correct.

24 Q So if you look at this letter, ISO New England

1 is approving the PPA subject to a number of  
2 requirements for each of the various segments of  
3 Northern Pass, and that's what that first part  
4 is, correct?

5 A Correct.

6 Q And then if you turn to page 3, they have an  
7 projected inservice date for the project, you  
8 see that? June 2017?

9 A Yes.

10 Q And then they have some additional requirements  
11 that are required in order to essentially put  
12 Northern Pass with a transmission line into the  
13 New England grid, correct?

14 A Correct.

15 Q And this is typical of approval letters.  
16 They'll have requirements that the ISO New  
17 England believes need to be done before a  
18 transmission line can be added to the grid?

19 A Yes. Some have them and some don't. Yes.

20 Q As I understand it, this was Mr. Bentley who  
21 oversaw this, not you, correct?

22 A Correct.

23 Q So what's on the screen now is Exhibit 123, and  
24 that is a Revision to the PPA that we just saw.

1 Do you see that in the subject line?

2 A Yes.

3 Q Okay. And I don't need to review this, but,  
4 again, this would have been ISO New England's  
5 review of the Revised PPA for the project at  
6 that time, correct?

7 A Correct.

8 Q Now, at this time, the project was still a 1200  
9 megawatt project; is that right?

10 A Yes.

11 Q And, again, this would have been overseen by  
12 Mr. Bentley. This isn't something you were  
13 involved in, correct?

14 A Correct.

15 Q So what's on the screen now is Exhibit 124, and  
16 if you look at the subject matter, this is  
17 specifically for Scobie Pond substation, do you  
18 see that?

19 A Yes.

20 Q Would I be correct in this I.3.9 was for the  
21 upgrades necessary after leaving Deerfield  
22 substation and heading towards Scobie Pond and  
23 because eventually that's where this  
24 transmission line will, for lack of a better

1 term, plug into the grid, correct?

2 A Well, I'd have to have the T24 REV-1 in front of  
3 me to see what the scope was.

4 Q But you can probably infer that that's what that  
5 is?

6 A That's probably a fair guess by the title.

7 Q And, again, I understand you weren't involved in  
8 this either, correct?

9 A Right.

10 Q Now, up to this point, what we've been looking  
11 at are I.3.9s for the 1200 megawatt project; is  
12 that right?

13 A Correct.

14 Q So when the project shift to 1090 megawatts, a  
15 whole new I.3.9 process had to be initiated, is  
16 that right?

17 A That's right.

18 Q And before we get there, what's on the screen is  
19 Exhibit 125 and that is withdrawing the request  
20 for the I.3.9 approval for the 1200 megawatt  
21 project. Because that's what you do is you  
22 withdraw the prior project and submit a new one,  
23 correct?

24 A Correct.

1 Q So what I put on the screen now is Exhibit 128.  
2 This is a document entitled Interconnection  
3 Request for Elective Transmission Upgrade. Do  
4 you see that?

5 A Yes.

6 Q This is the form that's submitted to ISO New  
7 England to start the I.3.9 ISO tariff process?

8 A Yes.

9 Q And this, if you look, and we don't need to read  
10 the whole thing, the Committee can read it, but  
11 if you look at the first page at the bottom, the  
12 very last line it refers to this new project is  
13 designed to deliver 1090 megawatts of power at  
14 an operating voltage of 320 kV DC. Do you see  
15 that?

16 A Yes, I do.

17 Q Then it goes on to describe the current project  
18 that's in front of this committee, correct?

19 A Correct.

20 Q And if you turn the page on page 2, at the  
21 bottom in the box it refers to the 1090  
22 megawatts delivered at Deerfield station. The  
23 direction of flow is from Quebec to New England.  
24 Do you see that?



1 A Yes.

2 Q Now, I understand the line is designed so that  
3 power can actually flow both ways; isn't that  
4 correct?

5 A A DC converter station can be made to operate in  
6 either direction. That's right.

7 Q So power can come down from Canada, but if  
8 requirements or the situation arises, power  
9 could go back up to Canada, correct?

10 A Well, the equipment is capable of doing it, but  
11 without the study, it's not allowed to.

12 Q I understand. They have to get necessary  
13 approvals.

14 A Correct.

15 Q Yes. Okay. Now, what's in front of you is the  
16 second to last page and if you see that was  
17 signed by Mr. Muntz on behalf of NPT?

18 A Yes.

19 Q And the date is May 29, 2015; do you see that?

20 A Yes.

21 Q And as I understand it, at this point you were  
22 still not directly involved in the project.

23 This was still Mr. Bentley?

24 A Correct.

1 Q What is in front of you on the screen is Exhibit  
2 126 which is the July 19, 2016, letter from ISO  
3 New England to Mr. Carberry. Do you see that?

4 A Yes, I do.

5 Q And is this the letter approving the PPA that we  
6 saw in the last exhibit?

7 A Yes. Well, the last exhibit wasn't a PPA.

8 Q Well --

9 A It is the ISO's approval of the PPA T31 through  
10 T37 Applications.

11 Q Okay.

12 A Those are CEII documents.

13 Q Okay. And this is approval for the different  
14 segments of the Northern Pass project, correct?

15 A Correct.

16 Q But as you indicated to Attorney Boldt a moment  
17 ago, it does not include an I.3.9 for the Coos  
18 Loop, correct?

19 A That's correct.

20 Q Now, if you look at this document, it has the  
21 inservice date of the project is May 31, 2019.  
22 Do you see that?

23 A Yes.

24 Q Now, if Northern Pass obtains all its necessary

1           approvals, the project is unlikely to be put in  
2           service by May 31, 2019; is that right?

3           A     I'm not the right person to -- I think the  
4           construction panel might be the proper people.

5           Q     You had the pleasure of sitting through the last  
6           several days, correct?

7           A     I'm not sure if pleasure is the right word but  
8           yes.

9           Q     I think you probably heard the testimony that  
10          said that construction is going to be two to two  
11          and a half years?

12          A     Yes.

13          Q     So fair guess to say that it's probably unlikely  
14          to be put in service by May of 2019 given a two-  
15          to two-and-a-half-year construction period?

16          A     Sure.

17          Q     Now, I understand that ISO New England can  
18          extend the inservice date for I.3.9 approval,  
19          correct?

20          A     Yes.

21          Q     And ISO New England can also revoke this I.3.9  
22          approval as well, correct?

23          A     Yes, they can.

24          Q     And when ISO New England reviews a project such

1 as the Northern Pass and studies the PPA and the  
2 other things that are submitted, it does so on  
3 the basis of the existing transmission  
4 facilities within the New England grid at that  
5 time, correct?

6 A Yes. At the projected date of inservice. Yes.

7 Q So, for instance, two years from now if Northern  
8 Pass is not placed into service, ISO New England  
9 could require Northern Pass or NPT to submit a  
10 new I.3.9 or require a review of the existing  
11 I.3.9, correct?

12 A I think they can require that of anybody at any  
13 time.

14 Q So, for instance, if circumstances change such  
15 as a different transmission line coming on line  
16 that would change the existing transmission  
17 facilities within the grid, ISO New England  
18 could review NPT's request to see whether to  
19 approve it or not or to require other  
20 conditions?

21 A No. Say any new proposed projects going  
22 forward, once an I.3.9 is approved, then the ISO  
23 maintains their future models with that in them.  
24 So if somebody were to come in now and propose a

1 project that were to go in service in 2020 or  
2 actually June 1st of 2019, Northern Pass would  
3 have to be in their model as the studies were  
4 done.

5 Q But ISO New England could then before Northern  
6 Pass went into service review it again to see  
7 how it fits within the existing facilities,  
8 correct? They always have that authority to do  
9 that.

10 A Well, they have the authority to, they have the  
11 authority to run the electric system in New  
12 England. So with that in mind, they can look at  
13 anything they want to look at. They, to my  
14 knowledge, have never revoked an I.3.9 approval  
15 that's been there.

16 Q And if the Northern Pass project were to change,  
17 like we saw from 1200 megawatts to 1090  
18 megawatts, a new I.3.9 would have to be  
19 submitted, correct?

20 A It depends on the change. The change that drove  
21 Northern Pass was not so much the megawatt  
22 value, it was the converter technology. It's  
23 really more a matter of the driver of it. If  
24 you downsize a project, thermally, you know

1           you're covered. It's more in the voltage and  
2           stability aspects.

3       Q     So but if those aspects changed, it would  
4           require a new I.3.9 process, correct?

5       A     They can. They don't always do that, but they  
6           can.

7       Q     Now, when the July 2016 letter we saw a moment  
8           ago was issued, were there any outstanding  
9           issues? I believe there was an SSTI study still  
10          being worked on?

11      A     Yes. One of the remaining issues is, and I  
12          guess SSTI stands for subsynchronous torsional  
13          interaction.

14      Q     I was hoping you were going to pronounce that  
15          and not me.

16      A     Yes. What it is, it's a study where you look at  
17          the interplay during faults between generators  
18          and high speed control systems which a HVDC  
19          system is a high speed control system. In the  
20          extreme case, it can result in damage to  
21          generator rotors, and so it's one of the things  
22          that's looked at to make sure it's acceptable.

23      Q     Has that study been done?

24      A     It has not been completed, no.

1 Q Okay. Are there any outstanding studies or  
2 issues that need to be done besides that study?

3 A None that I'm aware of. No.

4 Q Okay. Now, you mentioned a moment ago the  
5 change in technology from the initial I.3.9  
6 application to the current one. As I understand  
7 it, the original technology used traditional DC  
8 or line-commuted converter technology; is that  
9 right?

10 A You've got that right. Glad you said it.

11 Q I can read it. As I understand it, the current  
12 technology is based on something different  
13 that's known as DC Light or a voltage source  
14 commuted terminals?

15 A Correct.

16 Q As I understand it, the original technology used  
17 bipolar metallic return, meaning, for instance,  
18 if there were a problem on the line, half the  
19 line could run at a time. So, for instance,  
20 originally it was 1200 megawatts, if part of the  
21 line went down, the line could still run 600  
22 megawatts, correct?

23 A Correct.

24 Q But under the new technology which is known as

1 the symmetrical monopole technology, there's no  
2 return conductor, correct?

3 A Correct.

4 Q So as a result, if any portion of the  
5 transmission line is damaged, anywhere along the  
6 192 miles, the entire line shuts down, correct?

7 A Correct.

8 Q And the entire line would be shut down until  
9 that problem is fixed, correct?

10 A Correct.

11 Q So, for instance, if there were a problem in the  
12 underground and it took 2 or 3 or 4 weeks, that  
13 the whole line would be down for that period  
14 until the problem is corrected.

15 A That's correct.

16 Q Am I also correct that the new technology is  
17 actually less expensive to use than the original  
18 technology?

19 A Generally speaking, that's the perception that's  
20 out there. I don't have specifics, but that's a  
21 general industry perception. Yes.

22 Q Now, am I also correct that NPT's I.3.9 Tariff  
23 approval is for the energy market; is that  
24 right?



1 A No.

2 Q Okay. Correct me.

3 A The I.3.9 approval is a Reliability-based  
4 approval to show that the addition of the  
5 facilities does not create any adverse impact on  
6 the operation of the system and with that comes  
7 testing of contingencies or faults to make sure  
8 it doesn't create overloads or cascading  
9 problems or stability problems so that you get a  
10 wide range of blackout.

11 Q Does NPT need a separate I.3.9 approval or study  
12 to qualify for the forward capacity market?

13 A Yes. In the forward capacity market, it's not  
14 considered an I.3.9 application. You bid in the  
15 market to obtain a capacity supply obligation,  
16 and there are studies that go along with that  
17 also.

18 Q Have these studies been done yet?

19 A No. They haven't.

20 Q Can I assume those studies need to be completed  
21 before Northern Pass could bid into the forward  
22 capacity market, correct?

23 A Right. Typically what would happen is any  
24 entity, the ISO runs a yearly forward capacity

1 auction, and there are deadlines where any  
2 entity can submit a show of interest, and then  
3 after that show of interest is out there, the  
4 studies are done, and then people can place bids  
5 into the market when the auction actually takes  
6 place.

7 Q On page 4 of your Supplemental Testimony, you  
8 testified that, quote, over the long-term, the  
9 project will also help to meet future load  
10 growth requirements.

11 Do you recall that part of your testimony?

12 A Yes, I do.

13 Q Now, as I understand it, the current load  
14 forecasts are static, are they not?

15 A In terms of load or energy or demand or energy?

16 Q Demand. Future load growth. Hasn't that  
17 essentially flatlined?

18 A Yes. I think they are positive but at like .1  
19 percent or .2 percent.

20 Q And I think you described them in your technical  
21 session as going sideways?

22 A Yes.

23 Q And they've essentially been flatlined or going  
24 sideways for a while, have they not?

1 A Yes.

2 Q And they're expected to be flatlined or going  
3 sideways for a while into the future?

4 A Yes.

5 Q Let me for fear of treading on already tread  
6 ground, I just want to ask you a few followup  
7 questions on the Coos Loop. You were here when  
8 Mr. Quinlan testified that the Northern Pass  
9 project will include all necessary upgrades to  
10 eliminate the current constraints on the Loop,  
11 correct?

12 A No. I wasn't here when he said that. I came in  
13 the next day. But I was told he said that.

14 Q Now, if I look strictly at NPT's Application, it  
15 wouldn't indicate that, would it?

16 A I don't understand your question.

17 Q If I looked at the Application filed with the  
18 Committee, it does not include all the necessary  
19 upgrades for the Coos Loop; is that right? In  
20 order to relieve all the constraints on the  
21 Loop?

22 A I think that's correct.

23 Q So I just want to confirm the commitment and  
24 that's briefly review with you. Now, you've

1 indicated that the Coos Loop is  
2 export-constrained meaning the constraint is  
3 sending power out of the Loop into the grid,  
4 correct?

5 A Correct.

6 Q So you indicated there are two pipes of upgrades  
7 needed. Thermal issues and voltage issues,  
8 correct?

9 A Yes.

10 Q And the thermal issues involve upgrades within  
11 the Loop itself as well as some thermal upgrades  
12 that are outside the Loop, correct?

13 A Correct.

14 Q And the voltage issues are within the Loop and  
15 you mentioned that a minute ago.

16 A Yes.

17 Q In terms of the thermal issues within the Loop,  
18 that is upgrading a couple of the lines,  
19 essentially the conductor capacities within the  
20 Loop, correct?

21 A That's correct.

22 Q Some of them have 336 or 447 capacity and they  
23 really need to get to what's known as 795, for  
24 shorthand, correct?

1 A Yes.

2 Q And if all within the Loop is upgraded to the  
3 795 and then it will all be the same, and that  
4 will solve the thermal capacity issue or the  
5 thermal issue within the Loop itself, correct?

6 A Well, I guess I want to make clear the upgrades  
7 don't affect the Loop in its entirety. They  
8 affect the limiting section of the Loop.

9 Q Just so I don't overly test your memory which  
10 seems very good, could we have --

11 A My wife wouldn't agree with that.

12 Q Very good for certain things.

13 What you have in front you is Exhibit 45.  
14 It's a second page of an exhibit, and it lists  
15 the various segments of the Loop, and it has the  
16 conductor rating so that you can have it in  
17 front of you.

18 A Yes.

19 Q And so I understand not the entire Loop is going  
20 to be upgraded, but what is going to be upgraded  
21 thermally are those sections that have less  
22 capacity and they're going to be upgraded so  
23 that all of the lines within the Loop have  
24 upgraded capacity, if you will, or to that 795?

1 A Yes.

2 Q Now, I understand that what also needs to be  
3 upgraded is what's known as the Q195 line from  
4 the Whitefield substation, correct?

5 A Yes. A segment of that line.

6 Q And as I understand it, there are two segments  
7 to that line. There's about 1.2 miles that goes  
8 from the Whitefield substation to the Monroe  
9 substation, correct?

10 A Correct. Well, it goes to Comerford.

11 Q Okay. And then there's a longer section, about  
12 15 miles that goes to Littleton, correct? It's  
13 a total of a little over 16 miles, but there are  
14 two segments that make up that 16 miles.

15 A Okay. You've lost me.

16 Q Okay. The line that exports outside of the Loop  
17 that needs to be upgraded is known as the Q195  
18 line, correct?

19 A Correct.

20 Q And in order to increase the capacity to export  
21 power from the Coos Loop, the Q195 line needs to  
22 be upgraded, correct?

23 A A portion of it does, correct.

24 Q But that needs to be done in order to, if you

1 will, free up capacity from the Coos Loop?

2 A Correct.

3 Q And then the voltage issues you mentioned a  
4 while ago and you mentioned needed separate ISO  
5 study, that would be done at a later time,  
6 presumably after construction starts? Or any  
7 time, but --

8 A Yes.

9 Q And as I understand it, there are some  
10 generators on the Coos Loop that have good  
11 voltage regulators, sort of the newer  
12 generators?

13 A One or two of them have just recently been  
14 upgraded, yes.

15 Q But some of the older generators don't have as  
16 accurate voltage regulators, and, as a result,  
17 ISO New England needs to study the voltage  
18 issue, correct?

19 A That's correct.

20 Q And essentially what ISO New England needs to do  
21 is determine proper voltage regulation so if  
22 more capacity is being exported from the Coos  
23 Loop, it won't adversely affect the grid or the  
24 transmission system within the grid, correct?

1 A Yes. Well, what it won't adversely effect is  
2 the other generators within the Loop.

3 Q Okay. As I understand it, if ISO New England  
4 determines some sort of voltage regulation is  
5 required, it's likely to be sited at one of the  
6 substations within the Loop?

7 A Then with the problem identified, then what we  
8 do is test to find what the optimum location is.  
9 The right technology, the right size, and the  
10 best station to put it at to get the best  
11 results. Yes.

12 Q And that's sort of the last thing that needs to  
13 be done in order to fulfill the commitment to  
14 upgrade the Coos Loop to allow more capacity be  
15 exported from the Loop, correct?

16 A Yes. Well, then we've got to build it, too.

17 Q That would help.

18 A Yes.

19 Q Now, if all that's done, do you know the amount  
20 of capacity that the Coos Loop can then export  
21 to the New England grid?

22 A Under those circumstances, we should then be  
23 again back to a thermal limit only in that Loop.  
24 So it will depend on where the generation, you



1 know, is located kind of within the Loop in the  
2 contingencies. So I'd have to take a look. I  
3 can't give you a direct number.

4 Q After those upgrades are made, will all of the  
5 current generators on the Loop be able to, in  
6 laymen's terms, generate at full capacity and  
7 export to the grid what's not used within the  
8 consumers of the Loop?

9 A I'll have to check that.

10 Q Okay. If those upgrades are made, and  
11 additional capacity is added to the Loop, a new  
12 generator, a new wind farm, would the Loop then  
13 experience again some constraints because now  
14 we've added generation?

15 A Yes, it would. You'd be back to --

16 Q Sort of back to where we are.

17 A Yes.

18 Q Last area. Mr. Andrew, what I'm showing you is  
19 Counsel for the Public Exhibit 127 which is a  
20 letter from the Federal Energy Regulatory  
21 Commission to Senator Shaheen, and it asks some  
22 questions about the status of the TSA, and if  
23 you look at the paragraph that begins Title 18,  
24 Section 35.15. Do you see that?

1 A Yes.

2 Q And that states that Title 18, Section 35.15 of  
3 the code of federal regulations requires a party  
4 to make a filing with the Commission to cancel  
5 or terminate a Transmission Service Agreement at  
6 like 60 days prior to the date of cancellation  
7 or termination is proposed. Do you see that?

8 A Yes.

9 Q And it goes on to say the Commission has not  
10 received or accepted any such final from either  
11 party; do you see that?

12 A Yes.

13 Q Then if you look under number 2, the question is  
14 asked, to date, has either party filed an  
15 amendment to the TSA that has been accepted by  
16 or is currently being considered by FERC that  
17 would amend the NPT line approval date as  
18 defined in the TSA beyond February 17, 2017. Do  
19 you see that question?

20 A Yes, I do.

21 Q And at the top that question is answered, no,  
22 the Commission has not received any filing from  
23 either party to modify the approval deadline of  
24 February 14, 2017. Do you see FERC's answer to

1           that question?

2           A     Yes, I do.

3           Q     So are you aware -- let me ask you the question.  
4           Has NPT filed something with FERC to extend the  
5           approval date within the TSA?

6           A     I have no knowledge on the subject. I would say  
7           Mr. Ausere would have been the right person to  
8           ask that of.

9           Q     All right. So you don't know.

10          A     It may or may not have been done. I have no  
11          idea.

12          Q     But as of April 14, 2017, FERC hadn't received  
13          any. Is that what we saw in this letter?

14          A     That's what the letter says. Yes.

15          Q     Thank you, Mr. Andrew. I have no other  
16          questions.

17                   PRESIDING OFFICER HONIGBERG: All right.  
18           Next up we're to the Municipal Group.  
19           Mr. Whitley. Are you going to be doing it from  
20           there?

21                   MR. WHITLEY: Yes, Mr. Chair. No  
22           technology.

23                   PRESIDING OFFICER HONIGBERG: Off the  
24           record.

1 (Discussion off the record)

2 PRESIDING OFFICER HONIGBERG: Mr. Whitley,  
3 you may proceed.

4 MR. WHITLEY: Thank you, Mr. Chair.

5 **CROSS-EXAMINATION**

6 **BY MR. WHITLEY:**

7 Q Afternoon, Mr. Andrew. How are you?

8 A Good. Yourself?

9 Q Pretty good. My name is Steven Whitley. I'm an  
10 attorney on behalf a number of municipalities  
11 along the line. New Hampton, Deerfield,  
12 Pembroke, Littleton and the Ashland Water and  
13 Sewer Department. Also a spokesperson on behalf  
14 of two of the municipal intervenor groups. And  
15 I have really just one little discrete area I  
16 want to ask you about, and it relates to your  
17 testimony that you filed in this dated March 24,  
18 2017, and I believe you have that in front of  
19 you?

20 A I do.

21 Q Okay. And we've pulled it up on the screen  
22 here, and there's a selection of text there  
23 that's highlighted, but before I ask you about  
24 that, I actually want to make sure you see the

1 question that the highlighted text is responsive  
2 to which I think is only fair which is on page  
3 4. And you see there, you see the question?

4 A Yes.

5 Q Okay. And then you can go to the next page,  
6 Christine, and this is a portion of your  
7 response there. Do you see that?

8 A Yes.

9 Q So the response and just to state it out loud,  
10 the question was will the project's AC  
11 transmission system upgrades provide benefits to  
12 the power system. And a portion of your  
13 response mentions the converter terminal in  
14 Franklin and potential use and incorporation of  
15 the 345 AC facilities being converted into a  
16 Reliability Project if ISO determines there's a  
17 need for that.

18 A Correct.

19 Q And my question is, my understanding from  
20 Mr. Quinlan's testimony last week was that the  
21 likelihood of that scenario happening was very,  
22 very small, and, in fact, it was not the intent  
23 of the Applicants for this to be considered a  
24 Reliability Project. And by this, I mean the AC

1 portion of the line.

2 A Yes. That's correct.

3 Q That is your understanding of the intent of the  
4 AC portion of the line as well?

5 A Yes.

6 Q If, however, ISO determined in the future that  
7 there was a Reliability need and that the AC  
8 portion and the Franklin converter facilities  
9 would address that, ISO could, of course,  
10 determine that it is a Reliability Project at  
11 that point.

12 A Yes. I think the right way to look at this  
13 would be if we had a Reliability problem, and  
14 one way to solve it was to build another 345  
15 line from Deerfield up towards Franklin, we  
16 wouldn't build another one. We would use that  
17 existing one and tie in with new facilities up  
18 at Franklin.

19 Q Okay. I guess I'm, if that portion of the line,  
20 if there really is no intent for that to be a  
21 Reliability Project, and the likelihood of that  
22 is very small, then I'm wondering why you listed  
23 it as a potential benefit in response to this  
24 question.

1 A Okay. I think when some of this was originally  
2 prepared we were looking at load forecasts that  
3 were a lot higher, and we had one potential  
4 project that we were looking at that would build  
5 a 345 Loop from Deerfield up to Franklin and  
6 over to Coolidge in Vermont. And so the basic  
7 basis of this is if anything like that ever came  
8 up in the future, we wouldn't have to build from  
9 Deerfield north. We would take advantage of  
10 what's already there and tie into it somehow.

11 Q Okay. But your testimony is dated fairly  
12 recently. March 24th, 2017.

13 A Yes.

14 Q At that time, was that still the thinking?

15 A No. I mean, right now in terms of, I think as  
16 Mr. Pappas and I discussed earlier, our load  
17 forecasts in New England are pretty much going  
18 sideways. They're not growing, you know, at  
19 all. So there's no real vision that this could  
20 happen in ten years or beyond. It would take,  
21 well, I guess it would be a good circumstance  
22 where we had booming economic development in the  
23 state, but it would take tremendous amounts of  
24 load growth over and above what's currently

1 expected to actually drive this.

2 Q Okay. In light of that then, is it still your  
3 opinion that that is one of the potential system  
4 upgrade benefits to the power system?

5 A Yes. I mean, it could be used in the future if  
6 there's a need for it, but, so it's a potential.  
7 It's not on the horizon as we currently see  
8 things.

9 Q Okay. But it's enough of a potential that you  
10 still feel comfortable including it as one of  
11 the benefits?

12 A Yes. I mean, we would look at this, and if we  
13 could take advantage of an existing facility  
14 rather than build and construct another new one  
15 somewhere else, and it made logic and economic  
16 sense to use it, we would propose to do that.

17 Q Okay. Thank you.

18 PRESIDING OFFICER HONIGBERG: Ms. Pacik?

19 **CROSS-EXAMINATION**

20 **BY MS. PACIK:**

21 Q Good afternoon, Mr. Andrew. My name is Danielle  
22 Pacik. I represent the City of Concord, and I'm  
23 also the spokesperson for Municipal Group 3  
24 South. I also just wanted to ask you a question



1 about your Prefiled Testimony, and I'm looking  
2 at your Supplemental Prefiled Testimony dated  
3 March 24th.

4 Chris, could you turn to page 4, the top  
5 line 1? The question there that you were asked  
6 was will the project address power system  
7 concerns raised in ISO New England. And in  
8 response, you talk about the fact that as  
9 described in the Prefiled Testimony of Julia  
10 Frayer, the project will help to respond to  
11 nearly 8300 megawatts of coal and oil-fired  
12 generation that ISO New England has identified  
13 as being at risk of retirement between now and  
14 2020, correct?

15 A Correct.

16 Q And in that, you cite Footnote 3 and that is a  
17 roundtable discussion from June 14th, 2013,  
18 right?

19 A Correct.

20 Q And that was almost four years ago.

21 A Correct.

22 Q Could you turn to Joint Muni 88, Chris? I'm  
23 just -- could you go to the first page? Okay.

24 So this is the roundtable discussion that

1           you're referencing, that document?

2       A     Okay.  Yes.

3       Q     And at the top I've highlighted it's the June  
4           14th, 2013?

5       A     Correct.

6       Q     Could you turn to page 4 now?

7           Okay.  And so the 8300 megawatts that you  
8           talk about in your Prefiled Testimony, that's  
9           based on a 2010 economic study by ISO New  
10          England?

11      A     Yes.

12      Q     So that was six years ago?

13      A     Um-hum.

14      Q     And you would agree that the energy market has  
15          changed in the last six years?

16      A     Sure.

17      Q     And the forward capacity rules have changed?

18      A     Yes.  They have.

19      Q     Okay.  Could you turn to page 7?

20          So those generation, the 8300 megawatts of  
21          anticipated generation, that was for the  
22          capacity market in 2020, right?

23      A     Correct.

24      Q     And we actually just had the forward capacity

1 market auction, it was FCA 11, and that was for  
2 the capacity requirements in 2020?

3 A Yes.

4 Q So to the extent that this report is predicting  
5 a shortfall, that actually didn't occur, did it?

6 A Well, all that retirement? The 8300 megawatts  
7 of retirement did not occur. That's correct.

8 Q And --

9 A Parts of it did.

10 Q And the roundtable discussion with the concern  
11 about a shortfall, that also didn't occur for  
12 the 2020 forward capacity market?

13 A Correct.

14 Q Could you turn to Joint Muni Exhibit 12?

15 And this I'm just going to show you. This  
16 is marked as Joint Muni Exhibit 12, and this is  
17 the press release from the recent capacity  
18 auction, and that states that the annual  
19 capacity auction concluded with sufficient  
20 resources to meet demand in 2012 to 2021, and  
21 preliminary results indicate the clearing price  
22 was the lowest since 2013. Right?

23 A That's what it says. That's the line that's  
24 highlighted, correct.

1 Q And just to be clear, you provided the  
2 Supplemental Testimony with that reference to  
3 the Roundtable discussion on March 24, 2017?

4 A Yes.

5 Q And you didn't provide any updated information  
6 about retirements in it?

7 A No.

8 Q Okay. That's all I have.

9 PRESIDING OFFICER HONIGBERG: Ms. Fillmore,  
10 do you have anything separate from what's  
11 already been done?

12 MS. FILLMORE: No, Mr. Chairman.

13 PRESIDING OFFICER HONIGBERG: Is Attorney  
14 Saffo still here? Do you have any questions?  
15 Attorney Boepple?

16 MS. BOEPPLE: Thank you, Chair.

17 **CROSS-EXAMINATION**

18 **BY MS. BOEPPLE:**

19 Q Good afternoon.

20 A Good afternoon.

21 Q Mr. Andrew, I'm Beth Boepple. I'm representing  
22 the Forest Society. I have just a few  
23 questions, and I want to start with how long  
24 you've been employed by Eversource. I know it's

1 in your resume, but I'm not going to try to do  
2 math here this afternoon.

3 A Well, I guess I've been employed by Eversource  
4 as long as Eversource has existed. I started in  
5 1979 out of Northeastern as a Distribution  
6 Engineer for Public Service of New Hampshire for  
7 two years. I left there, went to work for Stone  
8 & Webster Engineering in Boston for  
9 approximately two years. Then ten plus,  
10 actually more like 15 years for Boston Edison.  
11 Boston Edison merged with ComElectric, became  
12 NSTAR, NSTAR merged with Northeast Utilities and  
13 became Eversource so of 35-plus years of  
14 professional work experience, almost 33 of them  
15 have been with Eversource or one of the  
16 precursor companies.

17 Q Okay. Congratulations.

18 A Yeah. I'm a dinosaur.

19 Q During that time, what period of that time have  
20 you spent analyzing proposed projects for their  
21 impact on New England's system stability or  
22 Reliability?

23 A Well, let's see. I spent ten years of that time  
24 in transmission system operations, five years as

1 an operator and five years as a manager of  
2 operations. I was responsible for setting up  
3 the Eastern Mass. Local Control Center facility  
4 for what was then NSTAR. Shortly after that, I  
5 moved, in 2010, I moved into the Director of  
6 System Planning position. So from 2010 to date.  
7 Previous to that, from 2000 to 2004, I was the  
8 Senior Planning Engineer, I believe.

9 Q And as the Senior Planning Engineer, you've had  
10 to analyze projects that your employer has  
11 wanted to bring into the New England power  
12 system; is that a fair assessment?

13 A Yes. I think it's more a matter in that time  
14 frame of you were given a problem and your task  
15 was to develop solutions and then justify which  
16 one is the optimum solution for  
17 constructability, cost, and system performance.

18 Q So in your experience doing that, have you ever  
19 had a project where you have determined that  
20 there would be a negative impact on New  
21 England's power system?

22 A Well, if you have that, you put that aside and  
23 move on to another choice that has a positive  
24 impact. Or realistically what you do is you

1 solve the problems as they're presented. If you  
2 have a need to inject power into a particular  
3 bus or a particular substation, and a line shows  
4 an overload, then you look for ways to solve  
5 that overload. Can you reconductor, can you do  
6 things.

7 So in a lot of ways it's like peeling an  
8 onion. You solve one problem, right? Then you  
9 look at another set of circumstances and you  
10 have a voltage problem, and you find the  
11 solution to that can be a capacitor bank. So  
12 that goes into the scope of your job. And so  
13 that's what you end up doing until you basically  
14 have a solution that has no problems anymore.

15 Q So would it be fair to say that by the time you  
16 get to a proceeding before the SEC, for example,  
17 you've never had a project where you would have  
18 suggested that there would be a negative impact?

19 A Right. Well, that's the I.3.9 process that ISO  
20 New England. Until you have an approved I.3.9  
21 that details the scope of work for what's going  
22 on, everything is conjecture. You're hoping.  
23 Once you've got the approved I.3.9, you know  
24 exactly what your scope of work is to

1 interconnect with no adverse impact.

2 So you really wouldn't see, well, previous  
3 to the competitive marketplace, any transmission  
4 owner would not have brought forth a project  
5 unless they were confident that it solved all  
6 the problems. There were no negative impacts.  
7 Today what we tend to see is people propose  
8 projects. Elective transmission upgrades. I'm  
9 going to bring so many megawatts from here to  
10 here. And yet they still don't know what they  
11 actually have to do to the existing electric  
12 system to do it with no adverse impact.

13 So until there's an approved I.3.9, you  
14 wouldn't bring a scope before a body like the  
15 Site Evaluation Committee because you don't know  
16 what you've got to build yet.

17 Q Right. I was trying to focus specifically on  
18 your statement in your Prefiled Testimony that  
19 the Northern Pass project will not adversely  
20 impact system stability or reliability. It's  
21 very unlikely you would make a statement other  
22 than that given the work that you do for  
23 Eversource and given the process you use to get  
24 to a SEC hearing, for example.



1 A Well, really to make that statement with any  
2 confidence and any information behind you, you  
3 have to have gone through the ISO New England  
4 I.3.9 process and obtained their approval also.

5 Q Okay. So let's talk a little bit about that.  
6 So your Prefiled Testimony on page 4 states with  
7 respect to the DC line that the project may be  
8 able to limit the effects of cascading blackout  
9 and that the DC power link has the capability of  
10 helping New England meet its reserve  
11 requirements.

12 Now, I understand these statements are made  
13 in the context of trying to provide indicia of a  
14 benefit to the New England power grid. Is that  
15 a correct characterization of those statements?

16 A Yes. Well, I think the characterization is the  
17 technology has the capability.

18 Q But those are not guarantees that those will be  
19 benefits provided if this line gets built; is  
20 that correct?

21 A Well, what happens in New England --

22 Q No, no, no. If you could just answer my  
23 question. That's not a guarantee. Correct?

24 PRESIDING OFFICER HONIGBERG: He's trying

1 to answer your question. I think you should let  
2 him give the answer he wants to give. If you  
3 think that that doesn't respond, then we'll  
4 talk.

5 A In terms of how the line runs to, say, provide  
6 support in the regulation market, it would have  
7 to be decided to bid into that market, and then  
8 you would have to win the bid to provide that  
9 capability. The line is certainly capable of  
10 doing that. The technology has the ability. As  
11 most generators on the system have the ability,  
12 it's a business decision and a bid process for  
13 the ones that actually do it. So could the line  
14 do it? Yes. Will it do it? I don't know that.  
15 It's a market decision, it's a bidding decision,  
16 things of that nature, but it's capable of it.

17 Q My question was, those are potentials for what  
18 could come, based on other factors, but it is  
19 not a guarantee that that will be a result.

20 A That's correct.

21 Q Thank you. Your statements in your Prefiled  
22 Testimony about the upgrades to the AC line all  
23 are couched in terms of those are requirements  
24 of ISO New England. Is it fair to say that the

1 upgrades on the AC line are being done because  
2 they're required by ISO New England in order for  
3 the line not to have a negative impact on the  
4 system?

5 A Okay. So you're referring to the upgrades on  
6 other existing network lines, not the new line  
7 that's being constructed?

8 Q I'm referring specifically to your testimony.

9 A Okay.

10 Q On page 4.

11 A Um-hum.

12 Q Beginning with line 20 where you talk about the  
13 AC system upgrades.

14 A Yes.

15 Q Okay?

16 A Okay.

17 Q And throughout that paragraph you make reference  
18 to requirements by ISO New England. So, for  
19 example, if it helps, line 25, the regional  
20 network upgrades required by ISO New England  
21 will allow the system operators to be more  
22 responsive and flexible in responding to power  
23 system needs.

24 A Um-hum. Okay. Hate to do this. Can we go back

1 to the question now? I'm just proving the  
2 memory issue.

3 Q So my question is, the proposed, the upgrades  
4 that you talk about as a benefit?

5 A Yes.

6 Q These are upgrades to the AC line, correct?

7 A Yes, they are. And some other reactive devices,  
8 yes.

9 Q But those are all actually being required by ISO  
10 New England?

11 A Yes. They're a requirement of the I.3.9 study.  
12 They were changes to the network to address  
13 problems so that the problems didn't exist  
14 anymore.

15 Q Okay. And so, therefore, is it logical that  
16 without those upgrades there would be problems?

17 A No. I guess. There are more tools in the  
18 toolbox for operators to use under different  
19 circumstances. They give them more choices,  
20 more variety, more options, but they can be used  
21 to address voltage problems that would exist if  
22 the project were not built, yes, I guess if it  
23 didn't exist, yes.

24 Q But in order for the project to be built, you've

1 listed those upgrades as benefits.

2 A Yes.

3 Q That will occur as a result of the project being  
4 built.

5 A Yes.

6 Q Okay. And so what I was getting as is if  
7 they're not, if the project is built, but those  
8 upgrades are not made, will there be problems?

9 A Yes.

10 Q Okay.

11 A The project cannot be built without these  
12 upgrades being included in the scope of work.

13 Q Okay.

14 A That's what the ISO I.3.9 approval dictates.

15 Q Understood. And just one sort of big broad  
16 question. A couple people have touched on this  
17 already, but I just want to be very clear. This  
18 is not proposed, this as in the Northern Pass  
19 project, is not proposed as a system Reliability  
20 Project, correct?

21 A That's correct.

22 Q It is strictly a for-profit project?

23 A Well, I think the form that Mr. Pappas had up,  
24 the elective transmission upgrade, is its

1 category within ISO New England which is a  
2 separate category from Reliability Projects.

3 Q Okay. Thank you.

4 PRESIDING OFFICER HONIGBERG: Next up, I  
5 think is CLF and the others. Attorney Birchard,  
6 do you have questions?

7 MS. BIRCHARD: No, we do not.

8 PRESIDING OFFICER HONIGBERG: Anyone here  
9 from NEPGA? No. Mr. Thompson. Do you have  
10 questions? Is Mr. Thompson here? Okay.  
11 Mr. Baker, do you have any questions?

12 MR. BAKER: I do. Thank you, Mr. Chairman.

13 **CROSS-EXAMINATION**

14 **BY MR. BAKER:**

15 Q Good afternoon, Mr. Andrew.

16 A Good afternoon.

17 Q On a lighter note, I want to assure you that  
18 your wife and my wife have at least one thing in  
19 common.

20 A I understand.

21 Q I'll call your attention to your Supplemental  
22 Affidavit, Exhibit 32, page 3. I think it's  
23 lines 5 and 6. Where you talk about an  
24 inservice date for the project of May 31, 2019,

1 and this is by way of followup of Counsel for  
2 the Public's questions. In order for that  
3 inservice date to be achieved, do you know when  
4 construction of the project would have to start?  
5 Roughly?

6 A I don't know specifics of the timeline.

7 Q Okay. You are aware that prior company  
8 testimony has indicated that there is an  
9 expectation that FERC will need to be reengaged  
10 with a subsequent order?

11 A I heard some discussion and questions with Mr.  
12 Ausere about a potential revision, I think, of  
13 the Transmission Services Agreement.

14 Q Okay. Would construction start before such an  
15 order is obtained, from your knowledge base?

16 A I don't know.

17 Q Okay. Fair enough.

18 At the bottom of page 3, same page, you  
19 reference a FERC order in the footnotes. Do you  
20 see that?

21 A Yes.

22 Q Which order is that?

23 A I think per the paragraph up above, it was the  
24 FERC order that accepted the Transmission

1 Service Agreement.

2 Q And that would have been dated in 2011?

3 A 2011. Yes.

4 Q So that is six years ago?

5 A Yes.

6 Q And that Application was for a different  
7 project, wasn't it? It was for a larger project  
8 with a fundamentally different structure where  
9 Hydro-Quebec was going to pay for everything?

10 A Well, I think the paragraph itself goes on to  
11 describe that it was in relation to the request,  
12 the original request to build the 1200 megawatt  
13 project.

14 Q So whatever FERC's conclusions were in that  
15 order, they related to facts on the ground six  
16 years ago?

17 A Well, yes. I think if you continue to read on,  
18 you know, it talks about that it diversifies New  
19 England's power mix. And the diversity of the  
20 power mix is, you know, 1090 versus 1200  
21 megawatts isn't changed all that much.

22 Q Right. But in your affidavit, your supplemental  
23 affidavit, you saw fit to reference conclusions  
24 reached by the FERC six years ago as pertaining



1 to your testimony today.

2 A Correct.

3 Q Correct? And therefore, the circumstances that  
4 were operative at the time of that order would  
5 have to be taken into consideration by anyone  
6 evaluating your conclusions with respect to that  
7 FERC order.

8 A Sure.

9 Q Could you turn to page 4, lines 2 through 4?  
10 You make reference and I think you were asked a  
11 bit about this before, to 8300 megawatts of  
12 retiring generation between now and 2020.

13 A Yes.

14 Q How many megawatts of proposed new generation  
15 are in the ISO New England queue between now and  
16 2020?

17 A I have no idea. I will grant you it is a large  
18 number.

19 Q You are on Planning Committee for ISO, aren't  
20 you?

21 A Correct.

22 Q Wouldn't that be something important for you to  
23 know to come before this SEC and state that this  
24 8300 megawatts of retiring power is going to be

1 a problem?

2 A Well, I think the first thing I want to note is  
3 8300 megawatts that could retire, and you know  
4 the ISO in many of their annual publications  
5 points that out. These are the older generation  
6 of power plants, coal-fired ones such as the  
7 Salem Harbor plants that are gone, the Brayton  
8 Point plants that are half gone. The other half  
9 goes shortly. You know, there's a litany of  
10 them. As far as the queue is concerned, what  
11 happens with the queue is people have an idea  
12 for a project, and if you look at the queue,  
13 you'll find hundreds if not thousands of  
14 megawatts of wind proposed in northern Maine.  
15 Now, the challenge there is there are no  
16 transmission facilities to bring that output to  
17 the load in central and southern New England.  
18 So simply adding up the number that's in the  
19 queue isn't really going to get you to something  
20 that's going to help understand the mix. You're  
21 back and forth.

22 Q Some of those projects, in fact, many of them  
23 will be connected, won't they?

24 A Certainly some will. You know, one of the

1 problems, the ISO has proposed to do what  
2 they're calling a cluster study for Maine  
3 because the problem is in order to bring any  
4 additional power down from Maine we need to  
5 invest \$2 billion in transmission. If I go to  
6 the first project and say will you spend 2  
7 billion, the answer is obviously no. And then I  
8 go to the second project and ask the same  
9 question, and I get a series of nos. If I have  
10 ten people and say can you collectively do this,  
11 it may actually happen.

12 Q But it's important to know that there are  
13 projects waiting in the wings to be connected,  
14 correct?

15 A There are people who would like to build  
16 projects, and they have put in Applications and  
17 they spend 50,000 plus dollars just to put in an  
18 Application.

19 Q And you're not aware of the numbers that ISO is  
20 publishing with respect to the projects that are  
21 in the queue between now and 2020? Is that  
22 correct?

23 A I have seen that in passing at different points  
24 in time, but I don't note it.

1 Q Let me see if this refreshes your recollection.  
2 I'm going to put on the screen a little passage  
3 from the New Hampshire Electricity Future done  
4 by the University of New Hampshire Carsey  
5 Perspectives. The authors are Cameron Mack,  
6 Matt Magnusson, Cristina Foreman and Fiona  
7 Wilson. And for reference, this has been marked  
8 as NGO 14, and I don't know if they're here. I  
9 apologize for stepping on their toes, but --

10 PRESIDING OFFICER HONIGBERG: They don't  
11 care.

12 Q I'm going to just put this up on the ELMO  
13 because there's only a couple of passages here  
14 that I need you to look at. Perhaps it will  
15 refresh your recollection.

16 That's the first page of the report, and I  
17 guess the first appropriate question is have you  
18 seen it before?

19 A No. I have not.

20 PRESIDING OFFICER HONIGBERG: Let's go off  
21 the record.

22 (Discussion off the record)

23 Q In my shaking hands, I've underlined the passage  
24 or passages that I'd like you to look at. It

1 says, if I can read it from here, approximately  
2 11,000 or more megawatts in the queue between  
3 now and 2020. Is that correct?

4 A That's what it says, correct.

5 Q Do you have any reason to doubt that?

6 A No, I don't.

7 Q I should have left it up there. It doesn't  
8 include any of the hydropower transmission  
9 projects from Canada. That's what it said  
10 anyway.

11 A I saw that note also.

12 Q I've just got two final issues I'd like to cover  
13 with you. Do you know what ISO says about the  
14 trend for electricity consumption in New England  
15 over the next decade?

16 A The trend, I guess my infamous term is it's  
17 going sideways. You know, whereas traditionally  
18 we have had large amounts of load growth, what's  
19 happening lately is principally due to  
20 state-funded initiatives in energy efficiency  
21 and/or subsidiaries for Distributed Generation,  
22 principally solar, that peak demands as we  
23 measure them are not really rising. They're  
24 going sideways.

1 Q Okay.

2 A And that's true is that the time of day peak is  
3 shifting to later in the day than it was  
4 traditionally 10 or 20 years ago.

5 Q I have no quarrel with your answer. I think  
6 you've been fair. In fact, I think the latest I  
7 saw from ISO New England was a trend line, a  
8 declining just by a very small fraction point, 2  
9 percent or something like that.

10 A Right. And that represents the increase, the  
11 projected increases in these programs going  
12 forward.

13 Q Last question. Wholesale prices in New England?  
14 Would you agree that they are at a 13-year low,  
15 the wholesale price for electricity?

16 A I have seen a press release basically by the ISO  
17 talking about last year, and they typically do  
18 that on a year-to-year basis, and I think that  
19 is what they did say. I will caution that's  
20 very weather dependent because if you go back to  
21 2013, you'll see a very different scenario.

22 Q I don't have a quarrel with what you've just  
23 said, and I thank you very much. I have no  
24 further questions.



1 Q I'm not even sure you can answer this question,  
2 but I think Attorneys Pacik and Baker sort of  
3 opened the door so I'm going to run in, and it's  
4 about the 8300 megawatts of coal and oil-fired  
5 generation that's potentially going off line.

6 One of the things that Mr. Quinlan had  
7 testified to as part of the Forward NH Plan is  
8 that Northern Pass will reduce CO2 emissions,  
9 and the way that's being done is to push fossil  
10 fuel plants off line. So it seems like one of  
11 the goals is to make sure that some of those  
12 plans retire to meet that goal. And then  
13 further down in your testimony it says the  
14 project will also help to meet future of load  
15 growth requirements, and it may avoid or defer  
16 the need to construct new fossil fuel plants.  
17 So it seems like if one of the goals is to force  
18 fossil fuel plants off line to get the CO2  
19 emission credit, if you will, one of the down  
20 side of that is to fill that void is to create  
21 more fossil fuel plants. Is that sort of  
22 talking out of both sides of the story here?

23 A Yes, I guess the important thing to understand  
24 is in the 8300 megawatts that are, quote, kind



1 of at risk for retiring and some of those units  
2 have, what you have is older units that were  
3 built in the '70s and/or coal, oil,  
4 predominantly oil-fired units that have higher  
5 emissions and what's called higher heat rates.  
6 They're very inefficient. Everything in New  
7 England that's being built today new that's  
8 fossil fueled is a combustion turbine. If the  
9 view is you want to be in the peaking market,  
10 it's what's called a simple cycle or it's a  
11 combined cycle, similar to the Granite Ridge  
12 facility is a combined cycle plant. And so our  
13 problem there is the dependency on a single fuel  
14 source. But to build anything new to meet  
15 emissions efficiency and be cost competitive,  
16 you'll be natural gas fired and a combustion  
17 turbine base. Those are the highly efficient,  
18 highly effective technologies.

19 So what's happening is as the older plants  
20 run less, the owners at some point in time have  
21 to make a decision of when do I kind of quite  
22 literally pull the plug. The owners of the  
23 Brayton Point plants in Somerset, Massachusetts,  
24 made that decision a couple of years ago. That

1           took 2000 megawatts out of the SEMA area and  
2           caused pricing in the SEMA area to rise. So  
3           that what happened in the previous years'  
4           forward capacity market, generation in SEMA was  
5           paid a premium and there are two new facilities  
6           that are going to come on in that area. So it's  
7           going back and forth. If we can bring in hydro  
8           capacity, then we don't necessarily need to  
9           build the next combustion turbine.

10           PRESIDING OFFICER HONIGBERG: Before you  
11           continue, what is the SEMA area?

12           A    Southeastern Massachusetts. I'm sorry. It's  
13           everything south of, say, the Quincy/Weymouth  
14           area and over into Rhode Island. I'm sorry.  
15           That's a jargon that we use in Planning.

16           PRESIDING OFFICER HONIGBERG: Off the  
17           record.

18                           (Discussion off the record)

19           Q    So the previous exhibit that I think Attorney  
20           Baker put up, the next line after what was  
21           underlined was 60 percent of that power is  
22           anticipated to be either natural gas or  
23           oil-fired. So we shouldn't read into that  
24           that's going to cause CO2 emissions to replace

1 the plants that are off-line. Because of the  
2 efficiency, the technology that we have now  
3 today, the CO2 emissions aren't going to --  
4 A Well, certainly, I think if you compare combined  
5 cycle plan to a coal-fired plant you would see  
6 an emissions drop for the amount of power that  
7 you would get out of there. So it depends on  
8 the vintage of the plants. But the ones that  
9 are in that at-risk list are the ones that are  
10 just a little bit younger than me, you know,  
11 that are in the '70s time frame when they were  
12 built. A lot of them were originally built with  
13 the idea that they were baseload facilities. So  
14 they weren't intended to move up and down and be  
15 used in a different way. So when you use them  
16 that way they become even less efficient. And,  
17 frankly, there are quite a few plants that every  
18 forward capacity market as it comes up, there's  
19 a point in time where the existing generators  
20 put in their kind of retirement, show of  
21 interest in retiring, and the planners all sit  
22 around and say what did you hear. You know.  
23 Who's going to go next. And when Brayton Point  
24 made that decision, that had a major cost impact

1 on the forward capacity market, but with that  
2 cost impact did come forward the Canal 3  
3 Generating Facility and Burrillville Energy  
4 Center to replace portions of that capacity that  
5 are retiring, but it's a very expensive price.

6 Q And I think what Mr. Quinlan has testified to is  
7 that there weren't specific plants targeted, if  
8 you will, to be retired, but I have to believe  
9 that there's an anticipation to get to the 3.3  
10 million tons of CO2 emissions being reduced  
11 there had to be some assumptions being made  
12 so --

13 A Well, I do know every year ISO New England does  
14 an emissions report, you know, that talks about  
15 CO2, NOx, the different bad chemicals, and they  
16 may have referenced, they may have referenced  
17 that with the idea that we're taking off the  
18 margin. I don't know the exact method, but they  
19 calculate it.

20 Q That's all I have.

21 PRESIDING OFFICER HONIGBERG: Mr. Wright?

22 **BY DIRECTOR WRIGHT:**

23 Q I think I just have one what I think is an easy  
24 question.

1           You brought up the power generation sources  
2           of combined cycle natural gas plants. I know  
3           through what I do for a living that those plants  
4           have different power generating capacities  
5           depending on atmospheric conditions. So in  
6           other words, different times of the year and  
7           depending on the air temperature, there's  
8           difference, so there's seasonal differences in  
9           how much power combined cycle natural gas plant  
10          can produce, is that correct?

11        A     Correct.

12        Q     And then also in your Prefiled Testimony you  
13          brought up that New England is heavily dependent  
14          on natural gas during the winter.

15        A     And summer.

16        Q     And I think you mentioned there's a possibility  
17          of natural gas plants being curtailed in this  
18          wintertime or during the summertime based on the  
19          fuel supply. So there are seasonal limitations  
20          to some type of generation.

21        A     Yes.

22        Q     Is there anything inherent in the Northern Pass  
23          line or Hydro-Quebec power, is there any  
24          seasonality limitations to the availability of

1           that power to be generated and delivered to the  
2           New England grid?

3       A     Not to the line itself.

4       Q     Okay.

5       A     Its ratings are, well, its ratings probably  
6           actually increase a little bit in the winter  
7           just because ambient temperatures are cooler.  
8           Most electrical equipment, the limiting  
9           parameter determines its rating is heat, its  
10          ability to dissipate the heat that's generated  
11          in it. We electrical engineers are always held  
12          back by mechanical engineers.

13                 But that's simply a true statement. So  
14                 most electrical equipment in the winter, because  
15                 ambients are cooler, you can get a little more  
16                 out of them. But in term of the DC line itself,  
17                 there's nothing that limits that. And then  
18                 beyond that in the Hydro-Quebec system, I'm  
19                 really not familiar with the system. But the  
20                 line and the AC interconnection portions, you  
21                 know, the ratings, it will always be capable of  
22                 that other than maybe some short-term problems  
23                 where we have to fix something.

24       Q     Okay. Thank you.

1                   PRESIDING OFFICER HONIGBERG: Commissioner  
2                   Bailey?

3                   COMMISSIONER BAILEY: Thank you,  
4                   Mr. Chairman.

5                   **BY COMMISSIONER BAILEY:**

6                   Q     Good afternoon.

7                   A     Good afternoon.

8                   Q     Is SEMA a capacity zone identified in the  
9                   forward capacity market?

10                  A     Yes, it is. It may be SEMA/RI, SEMA/Rhode  
11                  Island in there.

12                  Q     Or maybe Southeastern New England now?

13                  A     For the new combined zones. Correct.

14                  Q     That's what I'd like to talk about. The new  
15                  combined zones.

16                  A     Okay.

17                  Q     So the zone that New Hampshire is in is the  
18                  Northern New England zone?

19                  A     Correct.

20                  Q     And that includes Maine, Vermont, and New  
21                  Hampshire, right?

22                  A     Yes.

23                  Q     And is the NNE zone considered export  
24                  constrained?

1 A I don't really know. Because I haven't worked  
2 on the new zones yet.

3 Q Okay.

4 A Probably. And I mean that's not a definitive  
5 answer, but --

6 Q Okay. Assuming for this question that it is  
7 export constrained, could the AC line be used to  
8 relieve that constraint and, therefore, be a  
9 Reliability Project?

10 A No. Because the power injection would actually  
11 be into Deerfield which would be in the northern  
12 zone. So that would be something that would  
13 come out of the capacity market evaluations in  
14 terms of should Northern Pass look to get a  
15 commitment in the forward capacity market and a  
16 capacity supply obligation, as part of that,  
17 those studies would determine that.

18 Q And those studies haven't been done yet?

19 A They haven't been done yet.

20 Q Okay.

21 A They wouldn't be done until, or they would be  
22 done as part or a precursor to the forward  
23 capacity auction that the request was being  
24 placed in.



1 Q Okay. I think I heard you say a minute ago that  
2 to build anything new to be competitive you have  
3 to be a combined cycle plant or a combustion  
4 turbine.

5 A For new fossil fuel-fired generation, yes.

6 Q Oh, just new fossil fuel.

7 A Yes. Well, the most cost competitive form of  
8 generation, if you have the fuel available  
9 today, is a natural gas-fired combined cycle  
10 plant assuming you're not competing against any  
11 subsidized, you know, source otherwise.

12 Q So do you think that the energy that  
13 Hydro-Quebec wants to sell and transmit on  
14 Northern Pass is going to be competitive in the  
15 forward capacity market?

16 A Well, I guess I should restate that a little  
17 bit, mainly because I don't think we've built  
18 any new hydro in New England at least in my  
19 memory, you know, but the beauty of a hydro  
20 facility, and it was one of the beauties of a  
21 nuclear facility was you had a large capital  
22 cost up front but your operating expenses are  
23 very, very small. So probably the most cost  
24 competitive one, I guess, would be a hydro

1 plant, you know, once you've got it built  
2 because your fuel costs you nothing.

3 Q I understand that.

4 A Whereas with a natural gas-fired facility, your  
5 fuel costs are variable unless you can enter  
6 into long-term commitments back and forth. So I  
7 guess that's the best answer I can give you.

8 Q So I guess it would depend on the fixed costs.

9 A Yes.

10 Q Okay. Thank you.

11 **BY CHAIRMAN HONIGBERG:**

12 Q Mr. Andrew, you had conversations with Attorney  
13 Whitley and Attorney Boepple about the question  
14 and answer that start the bottom of page 4 of  
15 your testimony and roll over to page 5. Can you  
16 take a minute and read that question and answer,  
17 please? Just to yourself.

18 A Okay.

19 Q The combination of the two exchanges you had  
20 have left me confused. The question you were  
21 answering was will the project AC transmission  
22 system upgrades provide benefits to the power  
23 system, and that's on lines 18 and 19. You see  
24 that, right?

1 A Yes.

2 Q Then the next three lines essentially said yes.  
3 Correct?

4 A Correct.

5 Q You then break the answer into three parts.  
6 There's a first that starts on line 22, a second  
7 that starts on line 29 and a third that starts  
8 on the next page on line 6. Correct?

9 A Correct.

10 Q Now, with respect to your exchange with Attorney  
11 Boepple, she was asking you about a phrase  
12 that's in there on line 25 about the regional  
13 network upgrades required by ISO New England.

14 A Yes.

15 Q Do all three categories of upgrades fall within  
16 those that are required by ISO New England?

17 A Well, let's see. All of the upgrades that are  
18 listed in all of the I.3.9s have to be done.

19 Q I'm just trying to fix on the way you answered  
20 the question that was asked in the testimony.

21 A Okay.

22 Q You've got a first, a second and a third.

23 A Right.

24 Q The first refers to a bunch of very specific

1 upgrades, and I think that's what you're talking  
2 about with the I.3.9s, is that correct?

3 A Yes.

4 Q When you look at the second set of benefits that  
5 starts on line 29, that's as articulated anyway,  
6 it says in addition, and it talks about some  
7 other things. Are those things that are going  
8 to be required by the ISO process?

9 A No. Well, they're benefits that these upgrades  
10 provide even if Northern Pass is off line.  
11 Let's put it that way. In the, say, week each  
12 year or something where Northern Pass may be off  
13 line for maintenance activities, these other  
14 upgrades to the system are still there and are a  
15 benefit and a tool for system operators to use.

16 Q Right. And then the third category, the one  
17 that starts on page 5, line 6 that you talked  
18 about with Mr. Whitley, that's an, I'm not sure  
19 what word to use, but I think at this point it's  
20 hypothetical from your perspective.

21 A Potential future possible use.

22 Q But, again, not anything that's part of the ISO  
23 consideration of this line, right?

24 A Correct.

1 Q All right.

2 A That's more a statement that planners as we look  
3 ahead at changes of the system would look at  
4 that and say rather than build a new ten-mile  
5 line over here, if I can grab that and only  
6 build a five-mile line, I would do that. It's  
7 an option.

8 Q Right. I'm just trying to clear up the  
9 confusion, and it may just be me, that I was  
10 left with after you were done speaking with  
11 Attorney Boepple and Attorney Whitley about what  
12 was part of the ISO requirements and what were  
13 other benefits.

14 A Correct.

15 Q Okay. That's all I had. Attorney Iacopino, do  
16 you have any questions?

17 MR. IACOPINO: No questions.

18 PRESIDING OFFICER HONIGBERG: Anyone else  
19 need to follow up on anything up here? Mr.  
20 Needleman, do you have any redirect for the  
21 witness?

22 MR. NEEDLEMAN: No. Thank you.

23 PRESIDING OFFICER HONIGBERG: Thank you  
24 very much, Mr. Andrew. You can either stay

1           there or return to your seat. Let's go off the  
2           record for a second.

3                           (Discussion off the record)

4                   PRESIDING OFFICER HONIGBERG: So we're  
5           going to adjourn for the day. The next time the  
6           group will be getting together will be for a  
7           Prehearing Conference that will be the parties  
8           and a presiding officer on April 28th, and  
9           that's at 9 o'clock. The next hearing day is  
10          May 1st. That will also be at 9 o'clock and we  
11          will see you all then. Thank you.

12                           (Whereupon Day 5 Afternoon Session  
13          adjourned at 4:21 p.m.)

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**C E R T I F I C A T E**

1  
2 I, Cynthia Foster, Registered Professional  
3 Reporter and Licensed Court Reporter, duly authorized  
4 to practice Shorthand Court Reporting in the State of  
5 New Hampshire, hereby certify that the foregoing  
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14 relative or employee of any attorney or counsel  
15 employed in this case, nor am I financially  
16 interested in this action.

17 Dated at West Lebanon, New Hampshire, this 24th  
18 day of April, 2017.

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20 \_\_\_\_\_  
Cynthia Foster, LCR  
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