STATE OF NEW HAMPSHIRE

PUBLIC UTILITIES COMMISSION

October 23, 2014 - 8:34 a.m. ***DAY 7***
Concord, New Hampshire ***MORNING SESSION ONLY***

RE: DE 11-250
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE:
Investigation of Scrubber Costs and Cost Recovery

PRESENT: Commissioner Martin P.Honigberg, Presiding
Special Commissioner Michael J.Iacopino

F. Anne Ross, Esq., General Counsel

Sandy Deno - Clerk

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WITNESS PANEL: DAVID HARRISON, JR., Ph.D.
NOAH KAUFMAN, Ph.D.

* * * * * *

WITNESS: JOHN J. REED

P R O C E E D I N G S

CMSR. HONIGBERG: Is there anything we need to do before we resume the questioning of Dr. Harrison and Dr. Kaufman? I see some people not here, although I guess I think we knew Ms. Chamberlin wasn't going to be here first thing, and it looks like some PSNH people aren't here right now. But it looks like all of the lawyers are here.

So, Ms. Amidon, are you ready to continue?

MS. AMIDON: Yes. Thank you. And this part of my cross-examination, I will also be employing the talents of Mr. Frantz.

CROSS-EXAMINATION

BY MS. AMIDON:

Q. Good morning.

A. (Dr. Harrison) Good morning.

A. (Dr. Kaufman) Good morning.

Q. As we discussed yesterday, when you developed your two forecasts -- I'm talking about the two time frames -- you said you attempted to use information that was contemporaneous to those time frames; is that correct?

A. (Dr. Harrison) That's correct.

Q. And if I look at, I think it's Attachment 11 to your testimony, which is Bates 384, you use an item called "Increasing costs in electric markets." And the date on that is June 19th, 2008. Could you just identify the source of this document.

A. (Dr. Harrison) You mean what is this document? It's a presentation made by FERC on June 19th, 2008.

Q. And that's the Federal Energy Regulatory Commission?

A. (Dr. Harrison) That's correct.

Q. And when you developed your forecast for the early 2009 period, did you update this? Did you use an updated version of this report?

A. (Dr. Harrison) Well, just to be clear, we used this document for the range of natural gas plant costs. So we used the range that was taken from this document for the cost of building a new natural gas plant in the 2008 analysis. So we used the same prices that were reflected here in the early 2009 analysis.

Q. So you just didn't pay any attention to any of the other information in this report?
A. (Dr. Harrison) We did not use any information from this report. As I said, we were looking at this. It provided a source of range of natural gas -- the cost of building a natural gas plant.
Q. And were you aware of that FERC issued a State of the Markets Report -- State of the Markets 2008 Report on April 16th, 2009, which is in the time frame of the second scenario, the early 2009 period that you referred to in your testimony?
A. (Dr. Harrison) Well, we're aware that they issue those periodically.
Q. And did you look at this report?
A. (Dr. Harrison) I don't recall looking at this report.

MS. AMIDON: Okay. And this is where Mr. Frantz had some questions because he has reviewed the report. And we would like --

CMSR. HONIGBERG: Before Mr. -- sorry, Ms. Amidon. Before Mr. Frantz starts, are you talking about the document that you --

(Court Reporter interrupts.)

CMSR. HONIGBERG: So, do we need to, mark it as an exhibit?

MS. AMIDON: I was just going to ask that. Thank you.

CMSR. HONIGBERG: Then why don't we do that. That will be?

HEARINGS CLERK: 128.

(The document, as described, was herewith marked as Exhibit 128 for identification.)

CROSS-EXAMINATION

BY MR. FRANTZ:

Q. Good morning, Doctors Kaufman and Harrison.

A. (Dr. Harrison) Good morning.

A. (Dr. Kaufman) Good morning.

Q. I'm Tom Frantz. I'm Director of the Electric Division here at the PUC. I just want to ask some questions about your time frame for your analysis.

But actually, before we even get to that, can you just briefly for us describe your methodology for your modeling?

A. (Dr. Harrison) Well, I think I tried to provide that yesterday. Essentially what we did was, as I think I mentioned yesterday, we were looking at the cost to PSNH customers of three alternatives: One was to continue with the Scrubber Project and PSNH, and then comparing those costs, going-forward costs, with the cost of providing the same capacity and generation as with the natural gas unit --

Q. I'll be more specific.

A. (Dr. Harrison) Yes. Okay.

Q. I think we all heard that. You didn't use a production-cost simulation model, though, did you? You didn't model the dispatch of the units, an economic dispatch in ISO-New England to actually look at how much they ran and what the value of the plants were to customers, or the revenue they received as -- in your methodology, did you? That's the part I didn't get. I didn't quite get --

A. (Dr. Harrison) Well, just to be clear, we were looking at forecasts over the period from 2013 to 2027. So what we needed was for forecasts to be available over that period.

And so we have done work with production-cost forecasting models, typically using a smaller, more narrow range than -- a range that is more near-term than long-term.

Q. But you didn't do it in your analysis in this case; correct?

A. (Dr. Harrison) Well, we made the -- as I said, we did not do production-cost forecasting, use a production-cost model to forecast prices because we needed prices over a longer term.

Q. Thank you. All right. Now, if we can turn to the document that you received just a few minutes ago, marked as Exhibit 128. Are you familiar with FERC's Office of Enforcement, State of the Markets Report? It's an annual report.

A. (Dr. Harrison) Yes, I am.

Q. And this one's dated April 16th, 2009; correct?

A. (Dr. Harrison) That's correct.

Q. And that basically meets what your definition of "early 2009" would be; do you agree?

A. (Dr. Harrison) That's correct.

Q. In fact, you looked at the 2009 EIA/AEO forecasts for a basis of natural gas prices and other prices; correct?
A. (Dr. Harrison) That's correct.
Q. So if we could turn to, first, Page 5 of this document, please. And at the top of that document there's a chart entitled "Summer Gas Prices Reach Unprecedented Levels." Do you see that?
A. (Dr. Harrison) Yes, I do.
Q. Can you read the lines right below that chart, please?
A. (Dr. Harrison) Starting with "Natural gas prices increased..."
Q. Yes, please.
A. (Dr. Harrison) "Natural gas prices increased during the summer of 2008 to levels never before experienced during any previous summer in the United States. Henry Hub prices peaked at $13.31 per MMBtu on July 3rd. By the end of the year, Henry Hub spot prices had fallen to $5.71."
Q. And then the chart above that shows that peak and also shows the decline after that,

starting basically on probably the trading day of July 5th; would you agree?

A. (Dr. Harrison) Yeah, that's right.

Q. And then into early 2009, as you defined it, January, February, you know, March, April, okay.

A. (Dr. Harrison) Yes, I see that.

A. (Mr. Kaufman) We have a very similar chart in our testimony also.

Q. We've seen charts that look a lot like this one.

Now, if we can turn to Page 9. And this is -- again at the top of Page 9 it has a chart, "Unconventional gas fundamentally changes the natural gas market." Do you see?

A. (Dr. Harrison) Yes, I do.

Q. And just below that it says, "Today natural gas prices are below $4 per MMBtu"; correct?

A. (Dr. Harrison) Yes, that's what it says.

Q. Would you read the second paragraph, please, just into the record.

CMSR. HONIGBERG: Before you start, I would ask if you're to read something, try to read slowly so the court

reporter can get it down. Thank you.
A. (Dr. Harrison) "Natural gas production growth has been concentrated in what has been traditionally referred to as 'unconventional gas fields.' These fields include tight sands, coal-bed methane and shale formations, some of which are located near traditional producing basins, while others are located in remote areas. In 2008, unconventional gas production represented 51 percent of total natural gas production and grew 14 percent in 2008, while conventional production declined 3 percent in 2008."
BY MR. FRANTZ:
Q. Which is pretty much what the chart shows above that; would you agree?
A. (Dr. Harrison) That's right.
Q. Now, the next paragraph actually discusses pricing by FERC's Office of Enforcement. And if you would -- and I think for a complete record it's probably better to actually look at that whole paragraph, and I'll -- and then please read the last -- I want you to read the whole paragraph into the record, please.

A. (Mr. Kaufman) I'll read this one.

Q. Sure.

A. (Mr. Kaufman) "These unconventional gas plays have become economic due to innovations in horizontal drilling and fracturing technology. Unfortunately, there is limited information available on prices needed to cover operating and capital costs, including a reasonable return on investment; and the available estimates are disparate. On the low end, break-even prices range from $3.30 per MMBtu to $5 per MMBtu. On the high end, break-even prices" -- sorry. "On the high end, break-even price estimates for most producing basins are in the range from $5 per MMBtu to $7 per MMBtu range."

Q. How do those prices compare to what PSNH assumed and what you used in your forecasts?

A. (Dr. Harrison) Well, these -- I think what's -- these prices refer to prices in this period. We were looking at forecasted prices. So I think there's -- these are not really completely relevant to what we were describing, as I think other parts of this page indicated.

Q. Did those types of analysis give you pause when you actually looked at the forecasts that you used, though, for the increase in unconventional gas play and those types of prices that actually FERC was discussing at that time?

A. (Dr. Harrison) No. Actually, I think if you read this page, it gives -- it makes it clear that there was an enormous amount of uncertainty. So if you look at the sentence that was in the first paragraph on this page, it says, "Going forward, a key consideration is whether the natural gas production will be able to get into balance with consumption in a manner that will not lead to an exaggerated boom-bust cycle."

And later, the final paragraph describes the issues associated with break-even prices and drilling activity. And it talks about the concern about slowdown in drilling, and it says, "If sustained, the slowdown in drilling will likely lead to much lower production growth, or even production declines, which could in turn lead to much higher prices when industrial gas demand rebounds."

So I think it's important to put this in perspective. This report was a description of the large number of uncertainties in 2008 and early 2009. And that's -- of course, this is the state of the market in 2008. So it's designed primarily to explain what had happened in 2008.

What we were doing, to get to your question about whether this gives us pause -- not at all. I think it reinforces the importance of looking at different forecasts. So when we did our analysis, we looked at forecasts, 2013 to 2027, looking at the futures prices, which is one possible source of future estimated future prices, as well as the EIA forecasts. They were taking information like this and trying to develop forecasts for what these developments meant for the future prices of natural gas, electricity and coal going forward.

Q. Had you -- in preparing your analysis, had you read or looked at this before you actually filed your testimony and did your analysis, this actual document from the FERC from April 16, 2009?

A. (Dr. Harrison) I don't recall looking at this actual document. But there was a lot of commentary similar to this in other documents, including the EIA documents.

A. (Dr. Kaufman) Just to add to that, as Dave mentioned, the earlier document is from FERC from 2008 is where we got our capital cost estimate. I recall looking through a bunch of FERC documents from that time period just to see if they had updated their capital cost estimate. So I assume I would have seen this.

A. (Dr. Harrison) Yes, just to supplement that, I did see that this describes -- it doesn't have a new capital cost estimate for the price of -- or the cost of building a new natural gas plant. But it does comment that the prices are about 10 percent higher; therefore, we didn't feel, at least based on this, as I think about this, didn't see why, in that sense, it wouldn't have been something that we would have updated our estimates.

Q. Thank you.

Can you turn to Page 15 now. And at the top of that page is a chart that says, "Low gas prices changed generating plant dispatch." Do you see that?

A. (Dr. Harrison) Yes.

Q. And below that it says, "Representative Regional Supply Stack: October 2007."

A. (Dr. Harrison) Yes.

Q. And would you please now read the last paragraph on that page.

A. (Dr. Harrison) I'll do it this time.

"As fuel costs changed over the course of the year, the merit order of the electricity supply stack changed as well. This graphic shows that, during the first half of 2008, mildly efficient coal-fired generating plants, using coal from essentially any source, enjoyed an operating cost advantage over natural gas-fired generation."

Q.   And if you'd turn the page over now, please, the title of the next chart on the top of Page 16 is, "Low gas prices changed generating plant dispatch." Do you see that?
A.   (Dr. Harrison) Yes, I do.
Q.   Would you read the paragraph just below that chart?
A.   (Mr. Kaufman) "As this graphic illustrates, as natural gas prices started falling in July and coal prices stayed high, natural gas-fired generation became competitive with plants that use eastern coal. In some regions, particularly the Southeast and the mid-Atlantic, natural gas-fired generation became competitive with any coal plant that did not use Powder River Basin coal."
Q.   Do you know what coal Merrimack Station uses, by the way?
A.   (Dr. Harrison) It uses coal.
Q.   Do you know which coal it uses?
A.   (Mr. Kaufman) It's a mixture. It's not from one place, from what we understood.
Q.   Do you understand that it doesn't use any Powder River Basin coal?

A. (Dr. Harrison) That's what I would guess.

CMSR. HONIGBERG: Let's go off the record.

(Discussion off the record)

CMSR. HONIGBERG: Go ahead.

MR. FRANTZ: I just have one more question.

BY MR. FRANTZ:

Q. Would you turn to Page 23 of your testimony, please. You list a number of things that PSNH gave you for information to conduct your analysis; correct?

A. (Dr. Harrison) That's correct.

Q. If you look halfway down, it says "capacity price forecasts." Can you describe exactly what type of information you used for your capacity price forecasts?

A. (Mr. Kaufman) Well, we used a projection given to us by PSNH, as this says. So the reason we had to do that is that some of our forecasts for electricity prices only included the energy component. So this was in order to come up to sort of move towards coming up with a proxy for a wholesale electricity price.

Q. Do you know if those forecasts included the four capacity market auctions, or were they actual forecasts? Did you actually examine them in detail?

A. (Mr. Kaufman) Not in detail. I mean, Dave mentioned yesterday that we've done a lot of work on similar projects. So we looked at the numbers, saw they were sort of close to what we would expect; they were close to what other models in this very proceeding were predicting. So they seemed within the realm of reasonableness.

Q. Did they come from PSNH, or was there a source associated with those capacity forecasts?

A. (Mr. Kaufman) I don't recall.

MR. FRANTZ: That's all I have. I believe Ms. Amidon has perhaps a few more questions. Thank you.

CROSS-EXAMINATION (CONT'D)

BY MS. AMIDON:

Q. Thank you. I'm on the same page where Mr. Frantz left with you. One of the items that

PSNH provided you were estimates of the "sunk costs" that ratepayers would have been responsible for, for the Scrubber Project had it been cancelled at either analysis date. So, did you just accept those numbers, or did you do a sanity check to determine whether those numbers stood up?

A. (Dr. Harrison) Well, we did look at what the -- the estimates that were provided to us. But what we understood is that they had gone through a rather detailed analysis for the individual contracts to see for each one of the contracts what would be their obligation to pay if they had stopped in any particular -- in any given month. So it seemed like a very, very detailed analysis that would really require looking at the individual contracts, which we, of course, were not able to do. But it did show what you would expect, is that those costs are relatively small in the early years, but they become very large in the later years.

Q. What do you mean by "years"? You were looking at two different periods; right?

A. (Dr. Harrison) I think they provided... I'm trying to remember the range. But it was across multiple years from when -- I think starting in 2008 to 2011, 2012 or '13. I don't remember what the final date was.

A. (Mr. Kaufman) We just used the two numbers from mid-2008 and early 2009 for our analysis.

Q. Okay. And when did you get this information? Do you recall?

A. (Dr. Harrison) I don't recall the exact date, no.

A. (Mr. Kaufman) It was earlier this year.

Q. Sometime before you prepared your testimony, obviously.

A. (Dr. Harrison) Yes.

Q. Okay. The last bullet item on this list -- and I'm not going in any particular order here -- talks about assessments of the implications to Merrimack Station of various potential future environmental regulations. Do you recall what those potential future environmental regulations are that they asked you to consider?

A. (Dr. Harrison) Well, yes, I recall the various environmental regulations. Yes.

Q. And they were such as?

A. (Dr. Harrison) Well, one of them had to do with -- and I think we discussed this -- the 316(b), water intake regulations. Another had to do with the possibility of adding controls related to potential effluent guideline limitations. I think a third was coal-combustion residuals, and another had to do with air-emission regulations.

Q. And did you review those to see if that was a complete list? Did you do your own analysis of potential future environmental regulations?

A. (Dr. Harrison) Well, we do a lot of work on environmental regulation. And based on our sense, those were the major potential environmental regulations. Of course, that excludes the CO2 regulations that we talked about.

Q. So you just accepted the list as complete, without doing an independent review of potential future environmental regulations?

A. (Mr. Kaufman) One other report that we did take a look at was -- it was an ESS Group report. I think it was submitted to this Commission later than this date. But it did sort of go through what the obligations were for Merrimack Station, in terms of environmental compliance, which, in terms of providing a sanity check that we were covering all our basis, we thought was very helpful.
Q. And I'm sorry. "ESS" stands for?
A. (Mr. Kaufman) I don't know.
A. (Dr. Harrison) I don't recall either. But it was an attempt to look across the range of potential environmental control costs.
Q. And the costs -- okay. Thank you.
And just forgive me if I'm asking a question that has an obvious answer to you. But I wanted to know what the significance is of looking at natural gas transportation adders for Merrimack Station. I look at that, and it doesn't make any sense to me. So, perhaps you could explain to me why PSNH would provide that information in connection

with this review that you did.
A.   (Dr. Harrison) Well, it had to do with the prices that we got were not delivered prices to Merrimack Station. So we had prices that were -- and I think they were delivered to New England; is that right?
A.   (Mr. Kaufman) Well, we separated it into two source categories. So, when we used futures market prices, which was to sort of get a sense of what the market expectations were at a given time, those were for Henry Hub prices in Louisiana. So, in that case, it was important not to just use the price in Louisiana, but to use the price delivered to Merrimack Station; so that's where the transportation adders came in. We also used EIA natural gas prices as a different source, and those were actually delivered prices to a New England utility; so we wouldn't have needed the adder for that source.
Q.   Okay. Thank you.
MS. AMIDON: I have no further questions. Thank you.
CMSR. HONIGBERG: Ms.

Goldwasser.

CROSS-EXAMINATION

BY MS. GOLDWASSER:

Q. Good morning, Drs. Harrison and Kaufman. I'm Rachel Goldwasser from the law firm of Orr & Reno. I represent TransCanada in this docket.

A. (Mr. Kaufman) Good morning.

A. (Dr. Harrison) Good morning.

Q. I know this morning you talked a little bit about uncertainties. And I think in your testimony you reference, "extreme uncertainties" in the economy in the summer of 2008 and I guess early 2009; is that right?

A. (Dr. Harrison) I don't remember the exact phrasing, but I think we described the fact that there was a great deal of uncertainty. Those who remember the period in 2008 and 2009 will probably recall that.

Q. And the more uncertainty there is, the broader range of potential outcomes your report looks at to account for the risks; is that fair to say?

A.   (Dr. Harrison) Well, I guess it's fair to say that when we were looking at developing the parameters to report for our analysis, we wanted to reflect the range of uncertainties that seemed relevant at those time periods.

Q.   And so, if you look at Page 11 of your testimony, I think that's where you talk sort of generally about uncertainties in natural gas markets, and also you begin to talk about the economy.

     Is it a fair summary to say that the uncertainty you identify is whether prices would climb back to where they were in the summer of 2008 or whether they would remain low in early 2009, in terms of your 2009 analysis? The uncertainty is: Will they go back to where they were in the summer of 2008 or higher; or will they, you know, continue to drop or stay low as they were in early 2009? Is that fair?

A.   (Dr. Harrison) Well, it's fair, in the sense that that's the way we were looking at one way of thinking about the uncertainties. But this was just really -- this discussion was really meant to be an introduction to the forecasting, the forecasting that was -- that we looked at. The forecast that we looked at. So we were trying to give here the flavor -- and I think this came across, actually, in the state of the energy markets report that we were just talking about -- the nature of the uncertainties. So it was really -- this discussion wasn't addressing a list of questions that we then answered, but it was meant to be a background on the types of questions that analysts were thinking about at the time.

Q. And because there were these questions, it wasn't -- it's not -- it wasn't reasonable to present just one side of the coin. You weren't going to just do a study of, you know, if the analysts say prices are going to go down are right, here's what's going to happen. You present a range of options; is that right?

A. (Dr. Harrison) We did provide -- I think we mentioned it. We described developing up to 12 scenarios.

Q. And those scenarios have a pretty broad scope, in terms of the potential outcome.

A. (Dr. Harrison) In terms of the potential parameters, prices and so forth, yes.

Q. Let's look at your Exhibit 12. And that's the summary exhibit you were exploring with Attorney Frignoca yesterday. And I just want to understand how to understand this chart or how to use the chart.

Say I'm looking in the summer of 2008 at the market purchases scenario. If I said, well, the Scrubber Project is going to save customers $800 million, is that -- you know, is that a reasonable projection that I could make based on your analyses, without mentioning the other conclusions, the other potential conclusions?

A. (Dr. Harrison) I guess I'm not quite sure what question you're asking. In terms of how to characterize these numbers or how to characterize another estimate?

Q. No, I'm asking you about how to characterize your numbers -- or how to apply them, really. I mean, can I draw the conclusion that it would be plausible to conclude that the Scrubber would save customers $800 million over market purchases if I was doing this analysis in the summer of 2008? Or in the alternative -- I'll try to clarify -- would I really have to provide this range of potential outcomes to give a full story?

A.   (Dr. Harrison) Well, I think we would -- the tenor of our analysis was that it was useful to look at a wide range of possible outcomes. So, as I said, we went through a variety of scenarios versus -- for both of these options. So, we looked at -- in our independent analysis, we thought that would be what would make sense to do, to provide a range under these different sets of assumptions. I think I'm really saying roughly the same thing that you described as your predicate.

Q.   So I can't, you know, rely on your report to conclude that making a statement like, you know, the Project -- it would have been reasonable to conclude that the Project would save customers, you know, $400 million or lose customers $400 million. I can't take the numbers in a vacuum. I have to view them all together. Is that fair?

A. (Dr. Harrison) I think that's fair, in the sense that when we looked at the results and drew our conclusions about them, we looked at all the numbers in these various scenarios.

Q. On Page 36 of your testimony, which is at Bates Page 320, on Line -- starting on Line 7, you indicate, "While it is not unreasonable to continue to use long-term forecasts developed in late 2007 on the presumption that the changes to the market in 2008 might not persist, it is unreasonable to completely ignore the current state of the market and not also consider scenarios that account for the price increases of early 2008." Did I read that correctly?

A. (Dr. Harrison) Yes, you did.

Q. And that's in reference to what forecasts might be applied in the summer of 2008; is that right?

A. (Dr. Harrison) Yes, this was in the context of our comments on Mr. Hachey's natural gas

forecasts.
Q. I'm going to refer you to Attachment 4 to your testimony, which is at Bates Page 377. And that's an average monthly U.S. Natural Gas Wellhead Prices chart.
A. (Mr. Kaufman) Right.
Q. And so, if you were to apply that to an analysis that would be performed in early 2009, you would apply the same sort of standard; right? It wouldn't be unreasonable to use the newer forecasts. But you would need to include the possibility that prices might go back up or that prices might stay low, the same analysis as the one that you applied to the summer 2008 uncertainty; is that right?
A. (Dr. Harrison) I guess I'm having trouble understanding exactly what the question is. Remember, what we were doing is we were looking at forecasts of future prices over the period from 2013 to 2027. So, what we were doing in this exhibit is providing a context for that in describing what was happening in 2008 and early 2009.

Q. Right. And your criticism of Mr. Hachey is that he doesn't fairly take into consideration the possibility that prices rising in the summer of 2008 could have had a longstanding impact; is that right?

A. (Dr. Harrison) Well, I think our major criticism of Mr. Hachey was that he used forecasts that were too narrow a band, that he really didn't provide a range of plausible potential forecasts. We also noted that some of the forecasts that he -- the bases for the forecasts were from an earlier period. But the main point was that his forecasts were in quite a narrow band. And so if you looked at the forecasts in his -- we have a chart in our report that shows -- that compares his forecasts to our forecasts. That shows that his forecasts were in a relatively narrow band; ours were in a wider band. And then we also point out that one of the documents that he provided shows a still wider band.

So I think it's -- the context of that -- of our comments on his forecasts were really primarily designed to deal with our concern that his forecasts were too narrow a range.

Q.   And I think I know what chart you're talking about. You're talking about Attachment 17 at Page 407; is that right?

(Witness reviews document.)

A.   (Dr. Harrison) That's correct.

Q.   And you compare the forecast Mr. Hachey used with your high and low forecasts, and then with one Energy Security analysis forecast that he provided. Did you look at any of the other Energy Security analyses forecasts that were provided by TransCanada? In other words, was the only one you looked at was June?

A.   (Dr. Harrison) Well, we wanted one that was relevant for the time period we were concerned about.

Q.   That's not what I'm asking, though.

A.   (Dr. Harrison) I think we probably looked at the other ones, but this is the one that we were -- that was relevant.

Q.   Right. And you didn't look at the ones earlier in the year that would have applied

to the time frame that PSNH was talking about yesterday. I think Mr. Large indicated in his testimony that the forecasting that they used was from the winter -- the gas prices that they were using was from the winter of 2008. You didn't look at that ESIA forecast information on this chart, did you?
A. (Dr. Harrison) No. This chart was relevant to our analysis.
Q. And you didn't look at any ESIA data that came after that one June forecast, did you, on this chart?
A. (Dr. Harrison) We didn't. This chart only includes June 2008.
Q. Would it surprise you to find that Mr. Hachey provided forecasts from March of 2008, September of 2008, December of 2008, and March of 2009?
A. (Dr. Harrison) No.
Q. And would it surprise you that those forecasts are all much more closely bound to the forecasts that he provided?
A. (Dr. Harrison) I haven't seen those comparisons.

Q. You answered a couple of questions about cancellation costs. Do you know what number you used for your early 2009 analysis for cancellation costs?

A. (Dr. Harrison) I think it was $142 million.

Q. And the higher the cancellation cost you apply, the more economic a coal plant looks, right, because the comparison would be paying the sunk costs and not getting the plant; is that right?

A. (Dr. Harrison) That's correct.

Q. I'm going to ask a couple follow-up questions about the natural gas prices that you used because I just want to make sure that I also understand how you got to the numbers. And what I'm going to do is hand around -- I'm going to ask Attorney Patch to hand around some of the spreadsheets that you provided in discovery.

MS. GOLDWASSER: And I promise we won't get into a line-by-line analysis of those, Mr. Chairman. I'm sure that that is not what you want to do this morning.

CMSR. HONIGBERG: A

line-by-line analysis is a very unappealing prospect. So we appreciate that. Thank you.

BY MS. GOLDWASSER:

Q. So the first --

CMSR. HONIGBERG: Wait. Ms. Goldwasser, just a minute. Do you want to mark these as an exhibit, or are these just to be a demonstration for charts that already exists?

MS. GOLDWASSER: Let's mark them, because this information I don't believe is -- it's clearly in their report.

CMSR. HONIGBERG: So this is 129. Sorry. Go ahead.

(The document, as described, was herewith marked as Exhibit 129 for identification.)

BY MS. GOLDWASSER:

Q. If you look at the first two pages of the spreadsheet, these are printouts of your 2008 and 2009 natural gas assumption sheets. And the only change that I made on this is I put a source line on, and that's why it says "Spring of 2008" instead of "Summer for

2008." My apologies for that, but I think you know what I mean, at the top in the center.

Do these look familiar to you? These are your analysis sheets that you provided in discovery.

(Witness reviews document.)

A. (Dr. Harrison) I believe so, yes.

Q. And if you look at the bottom of the page, I really just want to make sure I understand where these numbers are coming from. You provide, I think, five different scenarios for gas prices. The first one is the EIA natural gas price delivered to a New England utility. Are those numbers in the EIA report?

A. (Dr. Kaufman) So when you say "report" --

Q. The EIA spreadsheets that you cite.

A. (Dr. Kaufman) That's right.

Q. And is it a delivered price to a gas combined-cycle plant, or is it a delivered price for retail? I mean, most utilities in New England don't own combined-cycle plants. So I want to make sure I understand -- or most related utilities don't, anyway. I want to make sure I understand what the assumption is with these numbers.

A.   (Dr. Harrison) When you say "assumption," who are they -- are they delivered to --

Q.   Is it the wholesale price? Is it a retail price? Is it delivered to a natural gas combined-cycle plant? I know. I just asked a compound question. So I'll stop.

CMSR. HONIGBERG: I think what you were doing was you were giving a range of choices. Is it one of those?

MS. GOLDWASSER: I'm trying to understand what -- yeah, I'm trying to understand what this is.

A.   (Dr. Harrison) These are the prices that would be paid by a plant that burns natural gas.

BY MS. GOLDWASSER:

Q.   Somewhere in ISO-New England, I presume?

A.   Yes, a New England utility. That's correct.

Q.   Okay. And does it start with a Boston City Gate price and then inflate it for transportation? How do you get to that number?

A. (Dr. Harrison) You mean how did EIA develop its forecasts?

Q. Is that what they do? This number is not comparable to a Boston City Gate price, is it?

A. (Dr. Harrison) These are prices that were developed by EIA.

Q. A Boston City Gate forecast. My apologies.

So, in other words, this is not apples-to-apples with the Boston City Gate price forecast, right, because you are including some sort of -- the EIA is including some sort of transportation adder; is that right?

A. (Dr. Harrison) I believe that's correct, although I have to look at exactly how they did that forecast.

Q. For the natural gas model that you did with these prices, did you assume some additional transportation adder to get the gas up to Bow, New Hampshire?

A. (Dr. Kaufman) If you're still talking about the EIA prices --

Q. Yeah, just talking about the EIA prices.
A. (Dr. Kaufman) Then, no, because this wasn't to any particular place in New England. I think it's meant to be an average.
Q. Okay. And the EIA L/W Service case, that's based on the report that was discussed yesterday from summer 2009; is that right?
A. (Dr. Harrison) No, I think this was the 2008 period. So this would have been the 2008 EIA report that evaluated Lieberman-Warner.
Q. Okay. And the NYMEX gas futures prices -- this is the next sort of category on this spreadsheet -- it says "June 2008 futures delivered." Are those NYMEX futures prices at Henry Hub, then, with some sort of transportation adder? What's that? "Futures delivered" is what it says.
A. (Dr. Kaufman) That's right. I think what this is supposed to be is the Henry Hub prices on one line, followed by the transportation adder on the next line, adding up to the delivered price on the third line.
Q. Okay. And so where it says "June 2008 futures delivered," that's really just a

Henry Hub price?
A.   (Dr. Kaufman) I believe that's right.
Q.   Okay. And I'm not an expert in this stuff, so my apologies if I'm asking dumb questions here.
     Are these prices -- are these the actual prices, the actual NYMEX futures prices going out to 2016 on the first line there, the "June 2008 futures delivered" --
A.   (Dr. Kaufman) I think what they are --
Q.   -- in each of those years?
A.   (Dr. Kaufman) So I believe what we did was we took -- there's daily prices from NYMEX. I think we took June 2008 daily prices and averaged them for each of the years stated here.
Q.   Okay. So the idea is someone's sitting in their office in June of 2008 and goes on to the NYMEX futures information portal and obtains what futures are trading at in each of those years between 2009 and 2016?
A.   (Dr. Harrison) That's correct.
Q.   Okay. And then, after 2016, I think your report indicates you inflate those numbers

out at 2.5 percent from there on out; is that right?
A. (Dr. Harrison) Yes, for the scenario that involved only using the NYMEX prices, that's right.
Q. Okay. And the last -- and that's the bottom line, the futures case 2008; right? We're all on the same page here?
A. (Dr. Kaufman) That's right.
A. (Dr. Harrison) That's correct.
Q. And then for the AEO futures blend and the Lieberman-Warner AEO [sic] futures blend, you used futures prices in the first, looks like three years?
A. (Dr. Kaufman) I believe it was two years.
Q. Two years. And then, from there on out you used the EIA data. No.
A. (Dr. Harrison) That's not quite right. It's easier if you look at one of the attachments we have that shows how the price -- the projectory. So, there we used -- that's what we call the "hybrid case," where we used the futures prices for the near-term prices, and then we had those adjusted so that they were

equal to, in the longer run, around 2020, that they're equal to the EIA forecasted price.

Q. So you slowly blend them proportionally as you go along in time? Is that fair to say?

A. (Dr. Harrison) That's one way of thinking about it.

Q. Okay. Thank you. And in terms of the differences between the summer 2008 and the spring 2009 numbers that you applied, the main difference is just that you used the Waxman-Markey service case; right? I mean, I understand that you used different EIA numbers; right? But in terms of modeling differences, you use the Waxman-Markey case instead of the Lieberman-Warner case -- is that fair -- for gas prices?

A. (Dr. Harrison) Well, that's right. But remember, I think Dr. Kaufman made the point that we needed to be consistent. So we had a different AEO forecast. EIA had changed its forecast, so we needed to make our CO2 price series consistent with the new AEO 2009 forecast. So, even though the provisions of the Lieberman-Warner and Waxman-Markey are very similar, we wanted to use a consistent set of prices.

A. (Dr. Kaufman) We also used updated futures prices for March 2009.

Q. Right. And I had one other question going back to the NYMEX futures.

You obtained the transportation adder that you used with the NYMEX numbers from PSNH; is that right?

A. (Dr. Harrison) That's correct.

Q. And did you do any fact-checking around that transportation adder that you applied?

A. (Dr. Harrison) Well, fact-checked, only in the sense that looking at it, that it seemed reasonable.

Q. I'm going to ask you to turn to Attachment 6, Page 1, which is Bates Page 379. If you turn to Note 2... that's really small type. I'm sorry. I don't have a magnifying glass for you. But it says, "Short-term prices are for two years from the analysis date," and then in parentheses it says, "longer futures contracts are often unavailable or highly illiquid"; is that correct?

A.   (Dr. Harrison) That's correct. That's what it says.

Q.   So you used the futures prices in your report and then inflated them after five or six years, or whatever the number is, to do one of your scenarios. But then, in your footnote you indicate that futures contracts are "often unavailable or highly illiquid"; is that right?

A.   (Dr. Harrison) Well, that's right. They're unavailable for the years after the years that we used them. But we -- for the futures -- for the scenarios, we use futures prices. They were the best sources of market information.

Q.   Well, I mean, you say here that short-term prices are for two years from the analysis date, and you seem to indicate that it's less appropriate to use them for additional years. But then, on your spreadsheet you indicate that you applied the actual futures contract prices for seven years or eight years from 2008. So I'm just trying to understand how to make sense of those two statements together.

A. (Dr. Harrison) Well, I think in terms of the -- this was the reason why we blended these futures prices for the two years. For our -- for the scenario which we used the futures prices, we thought it was appropriate to use all the data that were available.

Q. Dr. Harrison, you have a very robust resume. You've done a lot of reports like this. Have you ever employed NYMEX prices with an inflation note like this out to, you know, 15 or 20 years? Have you ever done that before? I'm not talking about the blended. I'm just talking about the NYMEX futures option that you applied.

A. (Dr. Harrison) Well, usually in a particular case, what we -- I don't recall doing this specifically. But we certainly have used NYMEX futures prices. And we certainly have used them for the period of time that they're available, yes.

Q. And did PSNH ask you to do a NYMEX futures option in your report?

A. (Dr. Harrison) No, I mean, I think, as we said, ours was an independent analysis. We chose the parameters that we used.

Q. Well, they -- you were told to do a gas plant option and a market purchase option; right? I mean, that was within the parameters of your contract.

A. (Dr. Harrison) Well, yeah. Just to be clear, the assignment was to compare the Scrubber Project to the two alternatives and then to use those two time periods, 2008 and 2009. But the parameters that we developed and the analysis we developed was ours.

Q. So, no one from PSNH asked you to do a NYMEX option in terms of the scenarios that you prepared. But you haven't prepared a scenario like this NYMEX before in another report.

A. (Dr. Harrison) I don't think I said that.

Q. Okay. Let's try again then.

You've used NYMEX prices, as far as they go, before in reports like -- for the number of years that they're available?

A. (Dr. Harrison) I don't recall -- I'm sure --

as I said before, I remember we've used NYMEX prices to do our analysis, in terms of the range of years that they're available, in several studies.

Q. So, "for the years they're available," you're talking about, you know, projecting six or seven years out?

A. (Dr. Harrison) That's correct.

Q. And have you ever used a 2.5 percent escalator after those years to further predict natural gas prices?

A. (Dr. Harrison) I don't recall the specifics of what we did. But oftentimes when we're doing these kinds of analyses, we have model estimates that we develop. So we've sometimes used -- for this, what we wanted to do was get a range of possible natural gas prices and electricity prices. And for that, this seemed like an appropriate methodology.

Q. I understand your testimony to be that you weren't asked to analyze what PSNH did. But did you know what PSNH did? Were you familiar with the studies that they performed?

A. (Dr. Harrison) They had performed the study, but not with all the details of what they actually had done, no.

Q. I'm going to ask you to look at a data request that you provided -- two of them, actually, back-to-back. Again, I'm trying to save time here by doing everything in one swoop. This is TC-6-149 and TC 6-167 SPO1. And I have a really simple question for you, and it's the only question I'm going to ask about this, which is: Are these -- do you recognize these data responses, and are these the ones you provided?

(Witness reviews document.)

A. (Dr. Harrison) Yes, this looks like what we provided.

Q. Great. Thank you.

MS. GOLDWASSER: I'd ask that this be marked as exhibit --

CMSR. HONIGBERG: Be 130. And I would just note for the record that it is one page, two-sided.

(The document, as described, was herewith marked as Exhibit 130 for identification.)

Q. I have a couple questions about the natural gas plant option that you considered.

You assumed that the gas plant would be sited in Bow, New Hampshire; is that right?

A. (Dr. Harrison) I don't think our analysis was specific to a location. It was -- as we talked about yesterday, I think it was a generic natural gas plant that would be developed, provide replacement power for Merrimack Station.

Q. In our NYMEX scenario, you used a transportation adder that PSNH provided. So I assumed from that, that the plant would be built in New Hampshire or at the Merrimack Station site. Is that incorrect? Is that an incorrect assumption to make based on that transportation adder?

A. (Dr. Harrison) That's right. So we were thinking of something that would be relevant to the Merrimack power.

Q. And do you have any sense of whether transportation adders would be lower if a plant were built in some other part of

ISO-New England?

A.   (Dr. Harrison) I don't know the details of the transportation adders in different locations, no.

Q.   Okay. And you're familiar, generally familiar, with the ISO-New England marketplace for power, I presume, based on your work?

A.   (Dr. Harrison) Yes.

Q.   And you know in states other than Vermont, in ISO-New England, competition has been employed. The utilities aren't vertically integrated; right?

A.   That's correct.

Q.   And the other states, and even some of the utilities here in New Hampshire, when a utility is going out to get -- to meet its default service obligations, it goes out to bid periodically, is that right, to get that default service met?

A.   (Dr. Harrison) That's correct.

Q.   And they go to companies like Constellation that provide delivery of that electricity to the default service customers; is that right?

A. (Dr. Harrison) Yes, that's correct.
Q. Do those utilities enter into long-term contracts with natural gas combined-cycle plants? Or more specifically, during the 2008 and 2009 frame, are you aware of utilities that required electricity to meet their default service needs entering into long-term contracts with combined-cycle plants?
A. (Dr. Harrison) Well, I don't recall the specifics. But again, just to be clear about what we did, we were looking at -- in our natural gas plant scenario, we were looking at the possibility that you would get replacement power from a natural gas unit located somewhere in New England. And our specific assumptions were located at the same -- providing the same power as Merrimack.
Q. Right. But when we're looking at it from a PSNH ratepayer perspective, I think yesterday it was established that -- and Mr. Frantz testified to this last week -- that New Hampshire law wouldn't permit PSNH to build a

combined-cycle plant. You heard that. I know you said you weren't sure you knew that before. But you know that now; right?
A. (Dr. Harrison) That's correct. I wasn't here for Mr. Frantz's testimony on that point.
Q. So the option would be somebody else building a combined-cycle plant and either feeding that power into the marketplace, into the competitive marketplace somehow; or I think the alternative option that you I think described yesterday was some sort of contract with the utility for the power from the plant. I guess the right term of art would be a "bilateral contract"; is that right?
A. (Dr. Harrison) Not exactly. I think what -- just to be very clear, what our analysis was, was looking at the possibility of replacing the power at Merrimack with a natural gas combined-cycle. This is sort of a very common kind of analysis that one does when one is looking at a large amount of generation capacity. It would be an alternative to a large amount of generation capacity. So, what you do is you want to

look at long-term circumstances.

So, in the context of the long term, you say, well, what are the likely additional resources that would be put in place to meet additional demand over the long term? And in the long term, you can't necessarily rely on the facilities that happen to be around at the time. So you want to look at the next additional capacity. And over this period, and frankly, right now as well, that additional capacity is provided by natural gas combined-cycle plants. So, that's really the context of our analysis. It wasn't thinking that there were some concrete, specific assumptions about who was going to do that plant, but that this natural gas combined-cycle plant was a reasonable alternative for providing additional generation capacity in New England over this long-term period.

Q. But your testimony doesn't give us any facts about whether, if a gas plant were built, who would be sort of paying for that plant, whether it would be fed into the ISO-New

England market and the cost distributed among a lot of people, or if PSNH ratepayers would pay for it via a PPA or something like that. Is that fair? Your analysis doesn't answer that question.

A. (Dr. Harrison) I think there's a series of questions in that question. But just to be very clear, we're looking at long-term costs of different plausible alternatives for providing the amount of generation and capacity that's provided by Merrimack Station.

Q. You've answered a couple questions about capacity factor, and I want to follow up on a couple things.

So, ISO-New England dispatches generating facilities; is that right?

A. (Dr. Harrison) That's correct.

Q. And it's based on an economic grid. If you're less expensive, you get dispatched; if you're more expensive, you're over the marginal line, you don't get dispatched; is that right?

A. (Dr. Harrison) That's a general way of describing the market.

Q. Well, keep things simple for me, okay. I don't think we need to get more detailed than that.

And when natural gas prices drop -- I think Mr. Frantz or Attorney Amidon asked you some questions -- when natural gas prices drop, a facility is less likely -- a coal facility is less likely to be dispatched; is that right?

A. (Dr. Harrison) In any given time period, correct.

Q. And you've already said, at least the short-term expectation in the spring of 2009 was that natural gas prices were dropping in comparison with other years; is that right? I think your testimony says that.

A. (Dr. Harrison) I think what our testimony does is describes the projections that we developed for natural gas prices.

Q. And the other question I had is, if there's a carbon cap, if a cap-and-trade program was put into effect, you would also expect coal to be less economic because coal would be more expensive than the alternatives in the ISO-New England stack, setting aside free allowances. I don't want to make this more complicated than it needs to be. But in general, coal would be more expensive and less economic than the alternatives with a cap-and-trade program; is that right?

A. (Dr. Harrison) Well, that's correct. And those concepts and that analysis is what's behind the EIA forecasts.

Q. And you also, I think, quote somebody important, the head of the IMF, on Page 10 of your testimony, that the financial system was "teetering on the brink of systemic meltdown," and there was a lot of economic uncertainty during the time frame at issue here. Would that also impact demand and potentially also impact how many facilities are dispatched or who gets dispatched?

A. (Dr. Harrison) Well, certainly the -- I mean, we described the fact that those conditions at the time did have an effect on electricity demand and other demands.

Q. I'm going to ask you -- do you have Exhibit

82 up there? I'll bring you mine because I don't want to hold this up.

(Ms. Goldwasser hands document to witness.)

Q. I'm sorry to stand over you like this, but I think this is the only way that the court reporter isn't going to --

MR. NEEDLEMAN: Rachel, what are you looking at?

MS. GOLDWASSER: Exhibit 82.

MR. NEEDLEMAN: Which is what?

MS. GOLDWASSER: It's the Annual Generation and Capacity Factor chart that you handed out last week.

Thank you, Chairman.

BY MS. GOLDWASSER:

Q. So you're looking at a chart that shows percentages, capacity factors and historic, I think, megawatt-hour production for Merrimack Station from 2004 to 2008; is that right?

A. (Dr. Harrison) That's right.

Q. And I think the blue line is supposed to be the percentage capacity factor; is that right?

(Witness reviews document.)

A. (Dr. Harrison) That's what it says, yes.

Q. And that blue line hovers under... a little under 82 percent in all years but 2008; is that right?

(Witness reviews document.)

A. (Dr. Harrison) That's right.

Q. And the capacity factor that you used in your report is 83 percent?

A. (Dr. Harrison) That's correct.

Q. And you used the capacity factor of 83 percent for all of the years going out from 2012 on; is that right -- or 2009 on?

A. (Dr. Harrison) 2013.

Q. 2013 on. Is that right?

A. (Dr. Harrison) That's correct.

Q. Did you adjust your capacity factor in your scenarios that assumed a cap-and-trade program?

A. (Dr. Harrison) No.

Q. You answered a couple questions about SO_2 prices, and I'm going to ask you to turn to what's hand-numbered spreadsheet "3."

CMSR. HONIGBERG: This is on

Exhibit 129, the four pages you handed out a few minutes ago?

MS. GOLDWASSER: Yes.

(Witness reviews document.)

BY MS. GOLDWASSER:

Q. Am I correct, if I look on the left-hand side of the page, it says "Coal Emissions Cost" and then says "Category." And then, if you look a few lines down, it says, "2008 Price (Nominal Dollars Per Ton)." Do you see what I'm looking at?

A. (Dr. Harrison) Let's see. Now, just to be clear, you're looking at the SO2? Is this on the SO2 --

Q. Yes.

A. Yes. I see SOx -- or the SO2 emissions price and then nominal dollars per ton, yes.

Q. Okay. And the SO2 price that you applied for your summer 2008 analysis was 194?

A. (Dr. Harrison) Well, I think the 194 was 2012. That wasn't actually a number that we used in our analysis.

Q. Okay. But that's the number you started at, and then you increased going out from there

at a percentage; is that right?
A.   (Dr. Harrison) That's right.
Q.   Do you remember what percentage you used?
A.   (Dr. Kaufman) It's constant in real terms. So we just increased it at the assumed rate of inflation.
Q.   Great. And if you turn to the next page and you look in the same general vicinity, the price that you assumed in the spring of 2009 or winter of 2009 is a little over $50 for 2013; is that right?
A.   (Dr. Harrison) That's correct.
Q.   Now, your testimony is from the vantage point of what a reasonable utility could have known at the time that decisions might have been made; is that right?
A.   (Dr. Harrison) Well, just to be clear, we were -- you said we were looking at two time periods, mid-2008 and what we referred to as "early 2009."
Q.   Right. So, for the summer 2008 analysis, you looked at what a reasonable utility might have known in the summer of 2008 without any knowledge of the future -- not any specific

knowledge of the future; right?
A. (Dr. Harrison) That's correct.
Q. And you provide some information about what happened with carbon regulation since 2009 in your testimony, sort of in parentheticals. And that's not really relevant to the analysis, is it?
A. (Dr. Harrison) I don't remember that, but -- specifically what you're referring to.
A. (Dr. Kaufman) I think it's relevant in the sense that, if you say what has happened was or was not predictable as of 2009, then it could be relevant.
Q. Okay. I'm a little bit confused. If we're doing this analysis based on what we think a company could or should have reasonably known in 2008, it can't know what we know now in 2014; is that right?
A. (Dr. Kaufman) No. I'm sorry if that was confusing. The example I had mind was SO2 prices. So you could say -- I think the point we make in our testimony specifically is that one of the scenarios we consider are the RGGI price forecasts. And the point we

make is that a utility -- that is really the scenario that kind of resembles the cost of SO2 that PSNH would have actually faced to date. And my point was just that, that was somewhat predictable as of 2009, that a federal cap-and-trade bill might not pass.

Q. And I think yesterday Attorney Frignoca asked you some questions about the study that was performed in the summer of 2009 that you used to draw conclusions about CO2 prices in the winter of 2009; is that right? Do you remember that?

A. (Dr. Harrison) Yes, I do.

Q. And the information that you used would not have been available to PSNH even as late as April 2009.

A. (Dr. Harrison) Well, yes and no. As I think we mentioned, this had to do with the so-called "Waxman-Markey Bill." And the Waxman-Markey Bill was very similar to the Lieberman-Warner Bill, in terms of its objectives and its predicted CO2 prices. In fact, I think we mentioned that, in February of 2009, Representatives Waxman and Markey asked EIA to do a forecast of what the likely effects of their bill would be. And in April of 2009, EPA estimated what those likely prices were, and they were in the same range as the Lieberman-Warner prices, about $13, $17 per ton.

So, there was a lot of -- among people who were following it at the time -- this is in 2009 -- there was a lot of information that was available about this particular proposal and its similarities between that -- and this was in the House. So at the same time, there was this Lieberman-Warner Bill that was going through the Senate process.

So I think that utilities at the time, in early 2009, would have been aware of the Waxman-Markey legislation. They would probably have been aware of the likely prices that were likely to be established under Waxman-Markey as being similar to Lieberman-Warner prices. And again, as I said, there was some analysis in April that confirmed that EPA analysis, in April of 2009, that confirmed that.

Q. In April. But not in March, but in April. I just want to make sure I got my time line here.

A. (Dr. Harrison) Well, yes. But as I said, in February, you know -- this had been discussed, actually, before they made the formal request in February. There was a lot of discussion about what the parameters of those bills would be and what the likely -- what the implications would be for CO2 prices.

Q. I'm going to ask you to turn to Attachment 15 to your testimony, which is at Bates Page 405.

So, for your low, your low case, you assume for dollars going out as the straight dark line at the bottom right above the X axis; is that right?

A. (Dr. Harrison) Well, no. Just to be clear, these are prices in nominal dollars. So it's hard to see, but that price actually increases in nominal dollars over the period. And those prices -- as I think Dr. Kaufman pointed out yesterday, those prices are based on the RGGI forecasted prices.

Q. Okay. So, basically, it's in whatever year you're in here, it's for dollars in that year's prices, but it would go up over time as a result of economic forces that I probably don't understand; is that right?

A. (Dr. Harrison) Well, no. This particular case is quite simple. These are assumed to go up at the rate of inflation.

Q. Okay. And your NERA high CO2 price -- and that's the price you apply in your scenarios -- is the squares -- the line with the squares in it, the dark line with the squares in it that starts at, I don't know, $10 or $12?

A. (Dr. Harrison) Well, just to be absolutely clear, this is labeled "NERA High CO2 Price" and in parentheses "national cap-and-trade, net of free allowances." So this is -- this takes into account the price that was estimated in this particular case for the Waxman-Markey legislation, and then it accounts for the fact that a large portion of the allowances were distributed for free in the early periods. And so it reflects the high CO2 price -- I guess the way we look at it is, this is the price in the high environmental compliance case.

CMSR. HONIGBERG: Dr. Harrison, I think we remember that testimony from yesterday. I think all Ms. Goldwasser's trying to get you to is to that line.

Right?

MS. GOLDWASSER: Right.

A. (Dr. Harrison) Okay. Right.

MS. GOLDWASSER: And that's okay, because actually he's leading me into what probably will be the next area of questions.

BY MS. GOLDWASSER:

Q. And the assumption you made, I think you said yesterday, is that you assumed 50-percent free allowances at the beginning of the time frame in question, and you ended up around 25-percent free allowances at the end; is that right?

A. (Dr. Harrison) Well, I just would -- the only thing I would change in that is we didn't assume it. That was part of the analysis we did.

Q. Okay. Well, that's an assumption that played a role in where that line is on the page.

A. (Dr. Harrison) That's correct.

Q. Right. And is that linear? So, should I assume, then -- say that's $12 where that first square is in 2013. If I assume that there would be no free allowances, would the high price then be $24 per allowance in this analysis?

A. (Dr. Kaufman) It's not exactly -- I mean, 50 percent, I think, is a ballpark estimate, but --

A. (Dr. Harrison) Approximately.

Q. Yeah. If we assume that it's 50-percent free allowances and -- in your high, but we -- and then say we create another case, and that other case is zero-percent free allowances, under the pricing scenario that you've modeled, the price of compliance would then be $24 per allowance?

A. (Dr. Harrison) That's correct.

Q. Okay. I just wanted to make sure I

understood that.

You also include in this chart a "reference case." Does that reference case get used anywhere in your analysis?

A.   (Dr. Harrison) Yes, it does.

Q.   Okay. And where is that?

A.   (Dr. Harrison) It's used when we commented on Dr. Stanton's analysis.

Q.   But it's not applied to the models that you present?

A.   (Dr. Harrison) No. As I said, we had our two cases, our high environmental compliance case and our low environmental compliance case.

(Ms. Goldwasser approaches chart on easel.)

Q.   Okay. And this is the chart we're talking about; right?

A.   (Dr. Harrison) That's correct.

Q.   Okay. Arts and crafts.

(Ms. Goldwasser drawing on chart.)

Q.   So this line that I'm pointing at here is your RGGI no-allowances price; right? The darker straight --

A.   (Dr. Harrison) The RGGI no-allowances --

Q. The RGGI, no federal statute case; right? In blue.
A. (Dr. Harrison) That's correct.
Q. Is that right? Okay.
And your high case that you apply in your model is this one here with the squares and the dark line?
A. (Dr. Harrison) That's correct.
Q. Okay. And Dr. Stanton low case the dashed line without any squares or circles in it?
A. (Dr. Harrison) Those were the prices from her testimony.
Q. Okay. And her high price is the squares, and her middle price is the circles with the dashed lines?
A. (Dr. Harrison) That's correct.
Q. Okay. I'm going to highlight those in pink.
MS. GOLDWASSER: And I'm going to ask that we mark this poster. I'm going somewhere. I promise.
CMSR. HONIGBERG: Fine.
MS. GOLDWASSER: Do we have a number?
CMSR. HONIGBERG: It's 131.

MS. GOLDWASSER: Thank you.

(The document, as described, was herewith marked as Exhibit 131 for identification.)

Q. I have here a report that was authored by NERA in March 2009 for Nevada Power Company.

Mr. Harrison, you do a lot of work with Nevada Power Company, don't you?

A. (Dr. Harrison) That's right.

CMSR. HONIGBERG: Are you marking this?

MS. GOLDWASSER: Yes, please.

CMSR. HONIGBERG: 132.

(The document, as described, was herewith marked as Exhibit 132 for identification.)

BY MS. GOLDWASSER:

Q. And do you recall submitting prefiled testimony in March 2009 on behalf of Nevada Power Company?

A. (Dr. Harrison) Yes, I do.

Q. And do you recognize this report that you submitted with that prefiled testimony?

A. (Dr. Harrison) I haven't seen it yet. But if it's the one I'm expecting to have, I do recognize it.

Q. Oh, my apologies. I'll bring a copy for Mr. Kaufman as well.

(Ms. Goldwasser hands document to witnesses.)

Q. Mr. Harrison, you do a lot of work with a number of power-industry companies, like Nevada Power Company, Entergy, AES, Dynegy, all those kinds of companies; is that right?

A. (Dr. Harrison) Yes, among other clients.

Q. If you look on the inside cover of this report, you're the lead author; is that right?

A. (Dr. Harrison) That's correct.

Q. And this report would be contemporaneous with the early 2009 analysis that you performed for PSNH in this docket?

A. (Dr. Harrison) Yes.

Q. And Nevada Power Company is a public utility in Nevada; is that right?

A. (Dr. Harrison) Yes, it is.

Q. This report assesses the environmental costs and economic benefits associated with certain expenditures that Nevada Power Company was considering in their IRP?

A. (Dr. Harrison) I guess I would say it slightly differently. It was designed to evaluate the environmental costs associated with various resource plans.

Q. And in assessing those resource plans, you developed a carbon pricing analysis in this report; is that right?

A. (Dr. Harrison) That's correct.

Q. Okay. I'm going to ask you to turn to Page 11. Can you read to us the first full sentence under where it says "b. CO2 Regulation"?

A. (Dr. Harrison) Yes. It says, "Most commentators expect the federal government to develop a cap-and-trade program for greenhouse gas (GHG) emissions in the 111th Congress, although there are, of course, uncertainties regarding any prediction of potential future legislation."

Q. And do you recall which federal statutes you used to develop this analysis that we're looking at -- I'm sorry, not which federal statute -- which federal bills you used to develop this analysis? Let me try it a different way.

A. (Dr. Harrison) I don't -- I would guess that this was Lieberman-Warner, although I would have to check.

Q. Okay. So, in March 2009, subject to check, the report that you did for a public utility in Nevada was analyzing Lieberman-Warner.

CMSR. HONIGBERG: I note at the top of Page 12 there's a reference to "Lieberman-Warner."

MS. GOLDWASSER: I was, actually, Your Honor, just going to ask Mr. Harrison to read the last two sentences of this section on CO2 Regulation, which are at the top of Page 12, beginning with the, "The most recent..."

A. (Dr. Harrison) "The most recent version of Lieberman-Warner would have distributed allowances to Nevada Power and Sierra, both as fossil fuel generators and as load-serving entities. Another proposal in the House of Representatives would provide no free allowances to covered entities and would auction all allowances instead."

Q. And so, as a result, you did -- of this report, you did an analysis of the various options that -- the proposals that Nevada Power was setting forward; is that right?

A. (Dr. Harrison) That's correct. In this, what Nevada Power asked us to do was develop a wide range of alternatives, in terms of potential price projectories, and also potential allowance allocations.

Q. Okay. Well, let's start with the allowance allocations. If you turn to Page 59 of the report, which is their Bates Page 425, that wide range of free allocations that this report considers for fossil fuel generators is between zero percent and what looks like maybe 30 percent, at most; is that right?

A. (Dr. Harrison) That's correct.

Q. And it goes down -- if we're trying to be in the same time frame to 2027, from between zero-percent free allocations and maybe 20-percent free allocations?

A. (Dr. Harrison) Yes. And just to be clear, this is for fossil fuel generators. There's also another allocation for electricity distribution companies.

Q. And to be clear, what we're talking about here is a utility-owned fossil fuel generation analysis; right? So, would you be looking at the allocations for electricity distribution companies in considering the Merrimack Station investment?

A. (Dr. Harrison) If they were also a distributor, yes. In other words, when we did this for Nevada Power, what we did is we added together the allowances that they would get as a generator and also as a distributor, because in a regulated utility they would be getting both those revenue streams.

Q. And if you apply that to PSNH in this situation, would PSNH get the electricity distribution allowances whether or not it owned Merrimack Station?

A. (Dr. Harrison) I believe, yes, they would. In the way in which these bills allocated free allowances, they would.

Q. So, the only chart we need to worry about for the purposes of the analysis we're doing today is Figure B-4 on Page 59.

A. (Dr. Harrison) No. I think what we would look at is the full set of allocations that the electric utility would get as a result of its activities in the state. And so, in the case of Nevada, we used -- we added both what they would get as a generator and what they would get as a distribution company. And we would do the same thing in the analysis for New Hampshire.

Q. I'm a little bit confused I think, because for the purposes of considering the Scrubber as an alternative to another generation facility, why does it matter what allowances they would get as a result of the fact that they're an electricity distribution company?

A. (Dr. Harrison) Well, the idea is that you'd be looking at the total amount of electricity that would be both generated and distributed. So, in the context of that, they would be getting the allowances for the distribution as well as the generation.

Q. I see. So the allowances that are

attributable to electricity distribution companies under these scenarios are a result of where the underlying power comes from; is that right?

A. (Dr. Harrison) Well, in this particular case, the allocation -- and we did it as we did it here for Nevada -- we looked at the amount of generation -- in this particular case, fossil fuel/coal generation -- and we used that as the basis for determining the allocations that they got, both as a generator and as a distributor. And that's what was expected in those legislative proposals.

Q. Okay. So, tell me something. What percentage range -- what's the highest percentage range that would apply from this report, in terms of free allowances, to consider the Merrimack Station scenario? Is it not around 30 percent?

A. (Dr. Kaufman) Can I just point out that these aren't comparable to the percentages that we were giving earlier? This is not the same, at all, metric.

Q. Okay. And why is that?

A. (Dr. Kaufman) Well, what we had described before were the percentage of Merrimack's CO2 emissions that would be covered by free allowances. This is the percentage of the total cap, it says at least, that would go to fossil fuel generators.

So, I mean, what we did was we took the total cap. We figured out how many allowances would be applied to fossil fuel generators. We decided, okay, we're going to look at Merrimack's portion of those that are given to fossil fuel generators. And then the percentages that we've been quoting to you are just the percentages of Merrimack's emissions that receive free allowances. That is in no way comparable to these numbers.

A. (Dr. Harrison) Yes, and just to be clear, when you're looking at these percentages, the reason that these percentages are relevant is because you're looking at a national bill and figuring out how you're going to allocate allowances to individual categories in the national bill. So as Dr. Kaufman said, these are the building blocks for the analysis of allocations to individual entities, but -- and I thought maybe that's where you were going -- but these percentages are not, as he said, comparable to the percentages we're talking about of a given utility's emissions.

Q. Well, the scenarios that you considered included a zero-percent free allowance scenario; is that right? In this report.

A. (Dr. Harrison) Yes. Nevada Power asked us to provide -- just let me provide quick background.

They asked us to provide a very wide range of possible costs to them. And the reason that they wanted that wide range is that they were considering -- they wanted to know whether the assumptions on CO2 costs had an effect on which of these various plans, which one of the various resource plans they decided upon. So what they asked us to do was provide a wide range of price forecasts, provide a wide range of allocation alternatives, so we can see whether the results of the individual generation plants are sensitive to that case. And so that's exactly what we did. And what we found and they used was, when we looked at these widely different assumptions about prices and allocations, that it didn't influence the choice of resource plan.

So, it's important to recognize the purpose of the analysis. It was not done in a vacuum. It was done with a specific aim in mind, which is providing a very wide range of alternatives and seeing whether that particular decision, the decision on the resource plan that they would make going forward, was sensitive to both the level of CO2 prices and the allocations. So that's why they asked us to look at a wide range of prices and a wide range of allocations. They did not ask us to look at what our likelihood -- what our best guess would be of the likely allocation or the range of prices.

Q. Let's look at the prices that you considered in your wide-ranging analysis. That's on Page 57; is that right?

A. (Dr. Harrison) Yes, it is.

Q. And this report considered a zero-percent or a free -- you know, zero-percent free allowances. So, in the first instance, let's just get these numbers off from our chart.

So, the top graph -- the top line in Figure B-2 is your high estimate. Can you give me a sense of what you think the number is for 2012?

A. (Dr. Harrison) I would say it's about, just judging, $30, $35.

Q. Okay. And this isn't -- I think it says somewhere that this is in metric tons. And that's slightly less than in regular tons.

A. (Dr. Harrison) This is actually short tons.

Q. Short tons. So we would increase a little bit on our graph; right? But we don't need to do that. It's a one point -- it's a $1.10 conversion?

A. (Dr. Harrison) Well, I think these are also short tons, as our analysis was in short tons.

Q. Oh, great. Okay. So, 35, something like that.

A. (Dr. Harrison) Hmm-hmm.

Q. And then, if you go out to 2027, where would

that line end up?
A. (Dr. Harrison) Oh, about 57.
Q. I was thinking more like 70?
A. (Dr. Harrison) Did you say 2027?
Q. Oh, I'm sorry. Yeah, I was thinking around 60. Sorry. My apologies. So, 57, 60, something like that. This is my not-very-scientific line drawing.
And your mid-case from the Nevada Power starts at $25 and goes to $40-ish?
A. (Dr. Harrison) That looks about right.
Q. Something like that.
And your low case probably goes like 12.50 to 24, 23; is that right?
A. (Dr. Harrison) That looks about right.
Q. See if I can do this.
And I've drawn those lines in orange, give or take, on the chart; right?
A. (Dr. Harrison) That's right. There's -- in terms of these prices. There's one more price that would be relevant to the analysis that was done, and that is -- when these prices were used in their analysis, they also used a price of -- a zero price -- that is,

they have -- they asked us to predict what the prices would be under different CO2 price alternatives. When they actually did the analysis, including both these costs and their resource costs, they included a zero -- a no-carbon price.

Q. Okay.

A. (Dr. Harrison) So, the range of prices that were actually used in the analysis would include zero.

Q. Okay. And you used something called "NEMS," N-E-M-S, to construct this analysis; is that right?

A. (Dr. Harrison) That's right.

Q. You didn't use NEMS to construct the analysis that you did in the report that you did for PSNH; right?

A. (Dr. Harrison) No, no. We used -- no, it is the same model, actually. The EIA forecasts that we used are actually based on the NEMS model.

Q. And we've had a little bit of a conversation about how to allocate free allowances. But in the zero-percent analysis, your high case is probably closer to Dr. Stanton's reference case than any of the other options; right?

A. (Dr. Harrison) That's what it shows on the graph, yes.

Q. And even if you decreased the price linearly with a 50-percent free allowance, your high case that you considered for Nevada Power Company is still higher than the high case that you considered for PSNH; isn't that right?

A. (Dr. Harrison) So you're asking me to compare -- again, the equivalent case would be for what we call the high -- our "high environmental compliance case" is equivalent to what there is described as the "mid-case."

Q. What I'm asking is, even if you calculated the free allowances that you used in your high case, which was 50-percent free allowances for PSNH in your PSNH high case at the beginning, the high case from Nevada Power would still be higher than your high case that you performed for PSNH.

A. (Dr. Harrison) I'm not -- I'm not sure I'm understanding the question. Are you saying

if we took the case that's listed there as "high price," and then we adjusted that to reflect the possibility of free allowances --
Q. Right.
A. (Dr. Harrison) Is that --
Q. Right.
A. (Dr. Harrison) I can't do the arithmetic exactly. I can't see that very well from here. But is it roughly 50 percent? Yes.
(Ms. Goldwasser shows chart to witness.)
Q. I'm trying to let everybody see, but I don't know if that's possible.
A. (Dr. Harrison) So you're looking at this price. And you're saying, suppose -- roughly along that line right there (indicating).
Q. It would be along the line of the Stanton low CO_2 Price, give or take, if you gave out free allowances under the Nevada Power Company?
A. (Dr. Harrison) I can't be sure, but that looks about right.
Q. Okay. Regardless, the prices that you modeled for Nevada Power Company are higher, as shown on that graph, than the prices that you modeled for PSNH.

A. (Dr. Harrison) No, I don't think so. As I said, the equivalent -- if we look at those prices, what we were modeling for this analysis was what the prices might be if there was a cap-and-trade program that was established. And so that is roughly equivalent to the mid-case in our analysis that we did for PSNH -- or looking at it from the perspective of PSNH going forward in 2009.

Q. But you didn't apply the mid-case to your scenarios.

A. (Dr. Kaufman) If I could just clarify? What he meant was our high environmental cost case for our PSNH analysis is conceptually equivalent to the mid-case in Dr. Harrison's Nevada analysis.

Q. Okay. But it's not conceptually equivalent to the high case that Dr. Harrison prepared for Nevada Power Company. Your high costs for PSNH are not conceptually equivalent to your high costs for Nevada Power Company.

A. (Dr. Harrison) That's correct.

Q. Okay.

CMSR. HONIGBERG: Ms. Goldwasser, how much more do you think you have?

MS. GOLDWASSER: Maybe two more questions.

CMSR. HONIGBERG: Outstanding.

MS. GOLDWASSER: Trying to keep the Chair happy.

CMSR. HONIGBERG: I'm more worried about the court reporter right now.

BY MS. GOLDWASSER:

Q. Would you mind turning to Attachment 12, please, on Page 400. Are you there?

A. (Dr. Harrison) Yes.

Q. Thanks. In the Spring 2009 analysis that you did for market purchases, the only two scenarios that would be a net benefit to ratepayers is -- are the ones that presume no cap-and-trade and low environmental costs; is that right?

A. (Dr. Harrison) That's correct.

Q. And the four scenarios that show that benefit to ratepayers if the Scrubber is not installed all consider your high

environmental cost analysis, except for the futures, the futures one; is that right?
A. (Dr. Harrison) Well, I think your -- well, of course, yes, the futures one does show a net -- a small net loss.
MS. GOLDWASSER: I have no further questions.
CMSR. HONIGBERG: Commissioner Iacopino.
SP. CMSR. IACOPINO: Thank you.
INTERROGATORIES BY SP. CMSR. IACOPINO:
Q. Good morning.
A. (Dr. Harrison) Good morning.
Q. I'm just going to go -- I just want to go over some things I heard that I need clarification on for myself.
Yesterday, you were asked by Ms. Frignoca about the fact that you only used the cooling tower costs in your high case. Can you explain why?
A. (Dr. Harrison) Well, yes. The high environmental case was designed to look at what the situation would be, what the cost

would be for the plant if a variety of regulations came to pass, or environmental compliance took various scenarios. And so one of those scenarios is 316(b).

So, what we decided was that there was a possibility that cooling towers would be required; so we wanted to include that in the analysis. But there was also significant likelihood that cooling towers would not be required at Merrimack, and so that was our other case. I think if you look at the history of what's happened with 316(b) -- and we've done a number of projects related to 316(b) -- I think that's a reasonable range of possibilities.

Q. How do you, in putting together your model, determine -- how do you measure likelihood?

A. (Dr. Harrison) We didn't. That's why we really did these two cases. So we don't really assess the likelihood of any particular case. That's why we really thought that it was important to have these 12 scenarios. And we don't really rank which one is more likely or not.

Q. If I understand the purpose that your study should be used for, it would be improper, then, to stick that $57- to $67 million cooling tower into each of the scenarios; is that correct? That would be an improper use of your study?

A. (Dr. Harrison) That's right, because in the high case it did include a cost for the cooling towers.

Q. Ms. Goldwasser asked you earlier today about where you got some of your information. I'm going to ask the question directly. Did Public Service tell you to use NYMEX futures in your analysis?

A. No, not at all.

Q. At any point in time, did you go to Public Service and say, "Can you give us some good idea on where we should get our cost-of-gas figures?"

A. (Dr. Harrison) Certainly not.

Q. Okay. Same question with the 2.5-percent inflation. It appears to be that's the rate that you used. We've also heard that used from a prior witness from Public Service.

Did they tell you to use that figure?
A. (Dr. Harrison) Not at all.
Q. Where did you determine that figure from?
A. (Dr. Kaufman) That is -- I think that's one of the numbers that, you know, we wanted consistency across the analysis. It doesn't particularly affect the analysis one way or the other if we assume 1.5 percent, 2.5 percent, 3 percent, because it affects all the scenarios. But that's one of the handful of assumptions that I don't think we asked PSNH for, but we did use it because they used it themselves.
Q. So you did use it because they had used it in their initial --
A. (Dr. Kaufman) I think that's right.
Q. So it wasn't based on that is the actual inflation rate.
A. (Dr. Harrison) No. But the predicted inflation rates I think were in that ballpark at that time.
Q. Okay. Now, I understand that you've qualified your testimony by saying that you're not here to determine legal prudence.

That's not your area. But if I understand correctly, from an economics standpoint, you say that your study leads to the implication that building the Scrubber was a reasonable economic choice. And I know you've been asked a lot about all the inputs into your study and the make-up of it. But how do you -- how do you come to the conclusion that the implication to draw is that it was a reasonable economic choice?

A. (Dr. Harrison) Yeah, I think what we said was that, if you looked across the -- we said it was important to look at uncertainties. And so this was a lot -- there was a lot of uncertainty at the time; so it wasn't really significant to focus on one particular result. And so what we really concluded was, we saw some of those scenarios where the Scrubber option was the least-cost option and others where it was not. And so what we said was, it was reasonable to conclude that the Scrubber option would be the low-cost option, not that it certainly, with a 100-percent probability would be the low-cost option.

But it would be a low-cost option. It was reasonable to make that conclusion, in light of the uncertainty that was relevant at the time.

Q. And the uncertainty is represented by the range of your scenarios; is that correct?

A. That's correct.

Q. But did you -- when you determined that it would be reasonable, were you giving more weight to any particular scenarios or -- I guess I'm trying to get to the mechanics of how -- I understand what the study shows. This question is terrible.

I understand what the study shows. In some cases it would be the economic thing to do, and in other cases it would not be. But did you tell us to draw the implication that it was a reasonable economic choice because more of them came up to be low cost or what? I mean, I'm trying to get to what the reasoning and the implication is, especially if there's not any particular higher weight given to one versus the other, one scenario versus the other scenario.

A. (Dr. Harrison) No, it really was looking at the full range and saying that that's sort of the inference that one would draw, that there was a lot of uncertainty, but that it was reasonable to look at that uncertainty and look at the various options and conclude, yes, it would have been possible to conclude that the Scrubber Project was a low-cost alternative for PSNH ratepayers.
Q. Sort of like a Gestalt thing.
A. (Dr. Harrison) Yeah, yeah, that's right. I mean, one could -- I suppose one could look at some of the specific results and then ask the question, you know, among the different scenarios, which one might be more likely. We didn't get into that assessment.
Q. And if you were actually doing this at the time, you probably could not.
A. (Dr. Harrison) That's right. Be very difficult.
Q. I just have one other question about free allowances. If I understood correctly, the free allowance situation comes out of the Waxman-Markey scenario only; is that correct?

Or are there free allowances in the other, when you considered the other potential bills that were pending?

A. (Dr. Harrison) No, the free allowances in the Lieberman-Warner were very similar.

Q. Okay.

A. (Dr. Kaufman) Really, in all of what we call "prominent proposals" at the time that had a realistic chance of passing through Congress, they had free allowances.

A. (Dr. Harrison) Yes. And just to that point, it's true that there were a lot of proposals, some of which did not have any free allowances, but none of the ones that were actually introduced as formal legislative proposals. And you could sort of see that because the EIA was asked to evaluate, and they really only evaluated a Bingaman-Specter earlier law, McCain earlier proposal, and then the Lieberman-Warner and Waxman-Markey proposals. The others were not formally evaluated.

Q. I think it was during Dr. Stanton's testimony, she referenced a Markey bill without the Waxman, and I was told when I asked her, that was not the Waxman-Markey bill, that was a different bill. Is that a bill that you believe should have been considered?

A.   (Dr. Harrison) No, that was an early -- it's interesting to look at the history. That's right. Congressman Waxman and Congressman Markey both had independent bills. It was interesting. I think that one of them had no free allowances. And what's interesting is, once they put together a combined bill, the Waxman-Markey Bill, actually formally put it forth, it had the same free allowance allocations. And this really followed a lot of discussion that had taken place on the cap-and-trade program in the EU that had been developed. And we actually were involved in that. And that developed free allocations. So that was sort of the context that a lot of these bills had, is that they recognized that, in order for these bills to be plausible, they needed to provide free allocation as a way of -- as a transition mechanism.

SP. CMSR. IACOPINO: I don't have any further questions, Mr. Chairman.

INTERROGATORIES BY CMSR. HONIGBERG:

Q. Good morning, gentlemen.

A. Good morning.

Q. A lot of materials that I might have asked you about has been covered. But would you pull up the Nevada Power Company report that you did, please. Do you have it?

A. (Dr. Harrison) This is our testimony --

Q. Well, it's--

A. (Dr. Harrison) Oh, the Nevada Power Company.

Q. The Nevada Power Company report, Exhibit 132.

A. (Dr. Harrison) Yes.

Q. There's two different graphs I want you to look at: One that Ms. Goldwasser was asking you about on Page 57 of the report, and the other one's earlier in the document, on Page 23.

A. (Dr. Harrison) Yes.

Q. They're labeled similarly, and the slopes look almost identical, but there are some differences in the words around them. Can you tell me what the difference is between these two graphs?

A. (Dr. Harrison) I think that the only difference is the X axis goes for more years. So it's -- the one on Page 23 goes out to 2039, and the one on Page 57 goes to 2030. I think that they're the same... let me just check that. I think they're the same graphs, just different years.

Q. The question running through my mind is why are they both in here. But it's not really that significant.

[Laughter]

A. (Dr. Harrison) Yeah, let me clarify that. One is an appendix. So the appendix that describes the methodology we used, and then the other is in the report with the results of the analysis.

Q. Fair enough. I don't think I have anything else.

CMSR. HONIGBERG: Mr. Needleman, do you have any redirect?

MR. NEEDLEMAN: I do. Wondering if we could take a break so I can trim my list down?

CMSR. HONIGBERG: Fine with me. So we'll come back in 15 minutes, at 10 minutes to 11.

(Whereupon a recess was taken at 10:34 a.m., and the hearing resumed at 10:55 a.m.)

CMSR. HONIGBERG: Mr. Needleman.

MR. NEEDLEMAN: Thank you.

REDIRECT EXAMINATION

BY MR. NEEDLEMAN:

Q. Actually, just a couple quick questions.

Dr. Harrison and Dr. Kaufman, several times while you were questioned, you were asked about this hypothetical gas plant that you created and then compared in terms of prices in your model. Do you recall that?

A. (Dr. Harrison) Yes.

Q. And you were asked at times about whether you understood that it would not necessarily have been legal for PSNH to construct or own a plant. Do you recall that?

A. (Dr. Harrison) Yes.

Q. Does the fact that PSNH might have

hypothetically been the owner, or any other entity might have been the owner, in any way affect your analysis?
A. (Dr. Harrison) No, it does not.
Q. Okay. Could you turn to Exhibit 128, please, which you were asked about this morning by Mr. Frantz. Looking at Page 9, the third paragraph --
A. (Dr. Harrison) Yes.
Q. -- you were asked the question about the gas prices listed in that paragraph. Do you recall that, whether the prices were reasonable for PSNH to consider at the time, something like that? I'm paraphrasing. I may not be getting it exactly right. Do you recall that?
A. (Dr. Harrison) Yes, I do.
Q. I want to ask you about those prices. Am I correct that the prices listed there are the price to produce that gas at that time?
A. (Dr. Harrison) That's right.
Q. Those prices don't reflect adders, for example, for transportation; is that correct?
A. (Dr. Harrison) That's correct.

Q. They don't reflect any increase that the producers or others might add on for profit; is that correct?
A. (Dr. Harrison) That's correct.
Q. And these are not forecasts. They are actual spot prices at the time; is that correct?
A. (Dr. Harrison) That's right. These are break-even prices at the time.
Q. Okay. A few minutes ago we spent yet more time on these charts. And I just want to ask you one more thing about this.
First of all, when we look at this chart -- and that now is, I think, Exhibit 132 -- 131 -- am I correct that the pink lines and the orange lines on that chart do not in any way account for free allowances?
A. (Dr. Harrison) That's correct.
Q. And you, I think, explained a moment ago, but I wanted to be clear, with respect to the orange lines on that chart, which of those would you say is the one that is most comparable to the analysis that you did here. I'm trying to make this an apples-to-apples comparison.

A. (Dr. Harrison) Yes, as I think I mentioned, the one that's relevant to this would be what we referred to in the Nevada case as the "mid-Nevada case" the mid-price case.

Q. So that's the middle of the three orange lines on that chart; is that right?

A. (Dr. Harrison) That's correct.

Q. I'm going to ask you to pop up for a minute and come over here. I'm handing you a red marker, and I'm going to ask you to draw on that chart. Focusing on the middle orange line, I would like you to adjust that for the allocation of free allowances and then indicate with that red line how that would then appear on this chart.

(Witness drawing.)

A. (Dr. Harrison) Okay. So what -- I'm going to start with this curve, and that's the curve going up. And we said that the allocations were about 50 percent for the early years, going to 25 percent in the later years. So I'll just go down here. This is the middle. So I'll go down here about halfway. And then I'm going to...

MR. GLAHN: You can see Dr. Harrison became an economist because his art talents were lacking.

[Laughter]

WITNESS HARRISON: Yes, I'll plead guilty.

BY MR. NEEDLEMAN:

Q.   So that red line represents what now?

A.   (Dr. Harrison) So this would be "mid."

Q.   So, is that red line now, in your best approximation, an apples-to-apples comparison between the Nevada report that we discussed earlier and the prefiled testimony report that you did here?

A.   (Dr. Harrison) Yes. And just to be clear, so, again, the red line is -- goes up like this. The "mid" is the one with the squares. So it goes up. But for technical reasons, these goes up at different slopes, which I could explain. But this would be the one that would be most comparable. So, the one with the red squares would be comparable with the allowance allocation. So, what I've really done is taken the mid-Nevada case, which is only prices, and adjusted it for the allocation that was expected under the Lieberman-Warner or Waxman-Markey and created something that would be the cost to PSNH and drawn that line. So that's, I would say, similar; higher, lower at different parts, but similar to what we had for our high compliance case.

Q.   Thank you. Just one more set of questions and I'm be done. You can sit down. Thanks.

So I'm going to ask you when you return to your chair to turn to Page 9 of your testimony.

A.   (Dr. Kaufman) Okay.

Q.   And I'm looking at Question 13. And you were asked if you had the information necessary to fully evaluate Mr. Hachey's testimony, and you said "No."

MS. GOLDWASSER: Objection.

CMSR. HONIGBERG: Yes.

MS. GOLDWASSER: This isn't in the scope of what was crossed.

MR. NEEDLEMAN: It's absolutely in the scope. Questions were specifically asked about Mr. Hachey's gas price forecast, and that's where I'm going.

MS. GOLDWASSER: I just asked if they looked at the other forecasts. I didn't get into this.

MR. NEEDLEMAN: She asked what he looked. She ran through all of the forecasts that Mr. Hachey produced.

MS. GOLDWASSER: I just asked them whether they looked at them. I didn't get into the substance of their --

CMSR. HONIGBERG: I don't know what the question is yet.

MS. GOLDWASSER: If Attorney Needleman wants to get into this, fine, then I may have a question on redirect -- on recross.

CMSR. HONIGBERG: I'm not sure you have a right to do that. But I don't yet -- I want to make sure I understand what the question is.

Can you repeat the question, Mr. Needleman? I'm sorry.

MR. NEEDLEMAN: I started by asking if they -- the question was: "Did you have all the information necessary to fully evaluate Mr. Hachey's testimony?" And they indicated they did not. And then I was going to point to the last portion of the last line, which said that it would -- that if they had the additional information that was requested, it would have been significant in evaluating Mr. Hachey's testimony.

And what I will jump to is that they were specifically, during their exam by Ms. Goldwasser, questioned about the chart, which is Exhibit 17, on Bates Page 407, the report, and that's where I'm going.

CMSR. HONIGBERG: Well, I don't think you need him to repeat his direct testimony, which I think you've got.

MR. NEEDLEMAN: Okay. Well, then I'll skip ahead and simply note there are two other places in their direct testimony -- and I won't ask -- but on Pages 34 and then Page 37, Footnote 15, where in all three places they indicate that it would have been helpful to them to have that information.

BY MR. NEEDLEMAN:

Q. So my question to you, looking at your chart on Page 17, is -- I'm sorry -- Exhibit 17, Page 407, having in mind that you were asked questions earlier about the price bounds on this chart and the reasonableness of those bounds, I want you to assume a hypothetical.

Assume that TransCanada has in its possession documents which are directly contrary to the three curves here that show Mr. Hachey's price curves, and in fact, those documents would be more akin to the black line showing the NERA high forecast. If those documents existed and you had them, would that affect your analysis here?

A. (Dr. Kaufman) Oh, yes. I mean, we were trying to get a sense for what the expectations and forecasts were at that time. This would be mid-2008. So you can see Hachey's three forecasts in the colored lines here, which is sort of a narrow band that increases over time. The lines outside of that show the range that we used. So I think, if I'm understanding your hypothetical, if we had information showing additional forecasts near the high end of our range, it would certainly have helped to reinforce our conclusion that such a range was reasonable to consider.

MR. NEEDLEMAN: And with that, Mr. Chairman, I'm going to ask that adverse inference be drawn that that information exists, and, as a result, it would support the analysis as Dr. Kaufman just indicated.

CMSR. HONIGBERG: We understand the request.

MR. NEEDLEMAN: I have nothing further.

MS. GOLDWASSER: I have very limited questions on recross.

MR. NEEDLEMAN: I object.

CMSR. HONIGBERG: I understand why you would object.

What is it you would like to ask these witnesses, Ms. Goldwasser?

MS. GOLDWASSER: I have one question about the apples-to-apples comparison that Attorney Needleman just had Mr. -- or Dr. Harrison perform on the graph, just to --

CMSR. HONIGBERG: And what would that question be?

MS. GOLDWASSER: The question is whether the free allowances that they depict on their chart include both the free allowances to distribution companies and the free allowances to generating facilities, the ones that -- the lines that are represented that were already in their testimony. So, whether the lines that are net of free allowances that they presented in their testimony include free allowances to both distribution companies and to generation companies. It's just a factual question.

CMSR. HONIGBERG: Wait, wait, wait, Mr. -- I mean Dr. Harrison.

Yes, Mr. Needleman.

MR. NEEDLEMAN: Before we go there, there are two issues: No. 1, there have been any number of occasions where I think members of our team would have liked additional redirect and have not requested it because we understood that was the end of the questioning; and No. 2, I believe under the

Commission rules, as the party with the burden of proof, we are entitled to go last. And so, for those reasons I object to any additional questions.

MS. GOLDWASSER: Fine with me if they have additional questions. It's just a factual question. I just want to make sure I understand what they are saying.

CMSR. HONIGBERG: Mr. Needleman is correct.

Notwithstanding the soundness of the objection, Dr. Harrison, do you understand the question Ms. Goldwasser would like to ask?

WITNESS HARRISON: Yes, I do. I'd be glad to answer it.

CMSR. HONIGBERG: Please answer it.

WITNESS HARRISON: Yes. I believe the allocation only relates to the generation. I believe I may have misspoken earlier. I believe that the allocation that we calculated in the context of Merrimack Station only includes the allocation that would have been provided to Merrimack as a generator.

MS. GOLDWASSER: Okay. Well, that opens the door to questions about the testimony that was provided when I was crossing Dr. Harrison with respect to the percentages in the Nevada Power report --

CMSR. HONIGBERG: I don't think --

(Court Reporter interrupts.)

CMSR. HONIGBERG: Ms. Goldwasser, there was another explanation for the problem you identified with those charts, and Dr. Kaufman gave it to you. You, at that point, you could have followed up with Dr. Kaufman as to the problem you had identified and what your -- what the assumption was. I think that, to the extent Dr. Harrison has clarified something he said earlier, I think that the time's passed for that. If you wanted to -- I'll allow you to make an offer of proof as to what you would ask him to clarify at this point.

MS. GOLDWASSER: I'm sorry. I

don't have my report in front of me.

CMSR. HONIGBERG: You want my copy?

MS. GOLDWASSER: The offer of proof is merely that the apples-to-apples comparison would be to the allocation to fossil fuel generators that's depicted in Figure B-4 on Page 59 of the Nevada Power report and not to the allocations scenarios that depict both fossil fuel generators and electricity distribution companies.

MR. NEEDLEMAN: I'm going to object because I simply don't understand that.

CMSR. HONIGBERG: Yeah, I don't either.

MS. GOLDWASSER: I can try again. This is a lawyer talking economics. My apologies.

CMSR. HONIGBERG: At this point, you're probably not going to be allowed to ask these questions, but I want to make sure you have an opportunity to make the record as to what you would ask. So I think you need to think quickly here as to what those questions would be. Do you want a few minutes to consider that?

MS. GOLDWASSER: No, I can reframe my questions.

CMSR. HONIGBERG: Okay. Go ahead.

MS. GOLDWASSER: In my conversation with Dr. Harrison during cross-examination, he indicated that the free allowances that would apply to the Project in the analysis of the Merrimack Station case would be the free allowances that would be given to a fossil fuel generation facility and to a distribution company.

CMSR. HONIGBERG: I think we all recall that. We all recall that.

MS. GOLDWASSER: My understanding of what he just said is that the free allowances that would apply are the ones that would apply to generation facilities only.

CMSR. HONIGBERG: That is what he said, yes.

MS. GOLDWASSER: And I just

want to assure myself that I know which chart of free allowances in the Nevada Power Company scenario is the one that would apply in an apples-to-apples comparison of the Merrimack Station case and the Nevada Power Company case, because it sounds like the testimony that he gave before is not exactly his intent.

CMSR. HONIGBERG: I think he was just asked specifically that question by Mr. Needleman, and he identified which lines are the apples-to-apples comparison.

MS. GOLDWASSER: Not in the report. There's different percentages of free allowances in the report than the percentages that Dr. Harrison applied in the Merrimack Station.

CMSR. HONIGBERG: Mr. Needleman.

MR. NEEDLEMAN: Whole new line of questioning here. It was Ms. Goldwasser that drew the orange lines on there. And based on the orange lines that she drew, I asked Dr. Harrison to make it into an apples-to-apples comparison. We are now going in a totally different place, and I don't think that's appropriate.

CMSR. HONIGBERG: Ms. Goldwasser, anything else?

MS. GOLDWASSER: No, sir.

CMSR. HONIGBERG: The objection's sustained.

MR. NEEDLEMAN: Thank you.

CMSR. HONIGBERG: I believe we're done with you gentlemen. Thank you very much.

WITNESS HARRISON: Thank you.

(Commissioners conferring).

CMSR. HONIGBERG: Mr. Reed, come on down.

* * * * *

(WHEREUPON, JOHN J. REED was duly sworn and cautioned by the Court Reporter.)

JOHN J. REED, SWORN

CMSR. HONIGBERG: Mr. Glahn.

DIRECT EXAMINATION

BY MR. GLAHN:

Q.   Good morning, Mr. Reed. Would you state your name for the record, please.

A. Yes. My name is John James Reed.
Q. Just briefly for the Commission, Mr. Reed, describe your background and education, et cetera.
A. Yes. I've been in the energy utility industry for 38 years. In that time frame I've worked in the industry for a utility, the nation's largest gas utility, where I was chief economist, and in consulting. Over the course of my consulting career, I have done extensive work on the economics and finance of public utilities, including electric generation. I have appeared as an expert in civil, administrative and arbitration cases on more than 150 occasions on the issues of public utility economics and finance.
Q. Are those -- is the description of instances in which you've appeared before other boards and commissions attached to your testimony in this case?
A. Yes.

MR. GLAHN: I would note for the record, before Mr. Reed makes is preliminary statement, that there was a portion of Mr. Reed's testimony that was struck by the Commission in the copy of Exhibit 16 -- or I believe it's Exhibit 16 that's in the record has that portion of the testimony identified.

BY MR. GLAHN:

Q. Mr. Reed, I understand you have a brief opening statement. If you would go ahead and make that at this point.

A. Yes, I do.

My rebuttal testimony in response to the testimony of Dr. Stanton and that of Mr. Hachey addresses three interrelated issues: First, what I believe is the correct framework for analyzing the prudence of PSNH's decisions regarding the Scrubber Project; second, whether using that framework, PSNH's decision falls within a range of reasonable decisions; and third, whether divestiture or retirement of Merrimack Station would have been a more reasonable and viable option for PSNH in the time frame from mid-2008 to mid-2010.

Taking each of these points in sequence, the regulatory standard of prudence, as it has been applied in New Hampshire and elsewhere, calls for the evaluation of a utility's actions relative to a range of reasonable and acceptable conduct. Prudence does not require that a utility's actions produce benefits for customers based on how matters turn out. And it recognizes that, as uncertainty increases, the range of acceptable behavior also increases. There is typically no single prudent decision in any given circumstance. And the standard recognizes that reasonable people can and often do differ in evaluating and choosing from among the options available.

In applying this framework to PSNH's actions, I began by recognizing, as has the New Hampshire Public Utilities Commission has recognized, that the Scrubber installation at Merrimack Station does not reflect a utility management choice among a range of options; instead, installation of Scrubber technology at the Merrimack Station is a legislative mandate.

The actions of PSNH were based on complying with the Clean Power Act in a cost-effective, timely and reasonable manner. The law allowed for very limited circumstances under which PSNH could request a variance from the requirements of the law: A variance in schedule for or in the level of the reduction requirement. Given that the mandated schedule and emissions level were reasonably achievable, as demonstrated by the Project, PSNH was clearly within the range of acceptable conduct in not seeking either of these variances.

While PSNH could also have sought approval for a divestiture of Merrimack Station, thereby transferring to a new owner the obligation of installing the Scrubber, the approval of the divestiture request and process, and the conduct of the divestiture process itself, could not have been accomplished before mid-2010. By that time frame, the market for coal-fired power plants had substantially deteriorated, and it would have been impossible to sell the plant on terms that would have produced a benefit for PSNH's customers. Such a sale would have increased the cost of capital for the plant, increased the assumed cost of completing the Scrubber Project, and increased rates to PSNH's customers.

These conclusions are based on my personal experience in managing generation divestiture processes that involved more than 75 generating units across the United States, and representing buyers in other such processes. The sales I have managed include all three of the divestiture processes that NSTAR has undertaken and other such processes in New England and New York.

PSNH did not pursue the retirement of Merrimack Station prior to installing the Scrubber. This was clearly within a range of reasonable behavior, given the statements made by the New Hampshire Public Utilities Commission and the Legislature in the 2008 and 2009 time frame, to the effect that retirement of station was not a valid means of complying with the Clean Air Project.

Installation of the Scrubber had been determined by the Legislature to be in the public interest, and it is inconceivable to me that in order to be within a range of reasonable conduct, one could conclude that PSNH needed to challenge that determination that had been made by the Legislature, after the Legislature had reviewed the updated cost estimate and assessment of cost impacts in early 2009.

Based on a regulatory standard of prudence, my assessment of PSNH's actions in building the Scrubber have led me to conclude that PSNH's actions were prudent. The Clean Power Act's requirements were clear, and the Legislature's objectives in leaving the requirements of the Act in 2009 unchanged were also clear.

The testimony presented by PSNH in this case demonstrates, through numerous analyses based on known and knowable facts at the time, that the installation of the Scrubber was carefully assessed, that the conduct of the Project was capably managed, and that the costs of this Project have been prudently incurred.

I recognize that, with the benefit of hindsight, this action may not have produced all of the economic benefits for PSNH's customers that would have been produced if natural gas prices had remained high; however, the prudent standard prohibits the use of hindsight. And the Clean Air Act was based on the pursuit of numerous benefits that went beyond simply securing the lowest price to consumers, including electric reliability, environmental stewardship and jobs.

In addition, it is unknowable at this time whether gas prices will once again rise to previous levels and that Merrimack Station will produce even greater benefits than are currently envisioned.

The fundamental question before the Commission is this: Were PSNH's decisions outside the range of what reasonable managers would have done at the time? A fair and complete review of these actions and the circumstances under which they were made does not provide any support for the positions of Dr. Stanton and Mr. Hachey that PSNH's decisions were outside of this reasonable range, or that these costs were imprudently occurred.

That concludes my opening statement.

MR. GLAHN: Mr. Reed is available for cross-examination.

CMSR. HONIGBERG: Mr. Sheehan.

MR. SHEEHAN: Thank you.

CROSS-EXAMINATION

BY MR. SHEEHAN:

Q. Good afternoon -- morning, still. My name's Mike Sheehan. I'm Staff counsel here.

Are you aware of some of the Commission orders that have followed not just your rebuttal testimony, but others, concerning the role that non-lawyer legal testimony will play in this docket?

A. Yes, I am.

Q. So, understanding you're not a lawyer -- is that correct --

A. That's correct.

Q. -- I am going to be asking you questions about prudence because that's, in effect, what your testimony is. And I understand what we are getting from you is the opinion of not a lawyer, but someone who's been in the industry and reviewed and made these decisions over the years. Is that fair?

A. I would say someone who's been accepted as an expert on the prudent standard in many jurisdictions across North America.

Q. Okay. The first question I want to ask you is: As you recognize, there is a statute in this case, the Scrubber Law, that certainly PSNH has characterized as a "legal mandate." I want you to assume for a moment that PSNH's understanding of the law is wrong and that, for whatever reason, the Commission were to decide it is not a legal mandate. In that case, would it ever be prudent for a company to, in effect, misinterpret the law and go down what we now decide is the wrong path? Or stated differently, a reasonable misinterpretation of the law. Could that be prudent? Or does the fact that the law was decided a different way close the door to any further prudence evaluation? Do you follow me?

A. I think I do. As I understand your question, is an interpretation of the law that's contrary to the interpretation placed on it by the ultimate finder of fact, or finder of law, mean that you were imprudent in reaching that perspective at the time?

Q. You said it much better than me. Thank you.

A. I don't think that's the case. I think that the question one needs to ask is: Is the interpretation that, in this case, the Company placed on that legislation at the time based upon facts and circumstances at the time within a range of what a reasonable person would have done? So if the act is capable of being misinterpreted by a reasonable person, and if a reasonable person could have come to the same conclusion that PSNH did in your example, then that conduct would be within a range of reasonable and prudent behavior.

Q. A slightly different topic. Managers are confronted, as you say, with a range of options for any particular decision -- and certainly here they were. And let's put aside the statute. Let's assume we've gotten past the statutory question, and the Commission is evaluating the economic decision of whether to go forward with the Scrubber or not. And I assume -- I understand there are a lot of assumptions that get us there that you and the Company may disagree with.

So, assume the statute doesn't exist. Assume they're facing the economic decision of do we go forward or not. And placed in front of PSNH were five or six or seven scenarios of what may happen in the future with various prices -- gas prices, construction prices, et cetera. And usually, as I understand it, when you do analyses and do lots of scenarios, there will be an outlier on each end and a clump of results somewhat in the middle, sort of a bell curve of analyses. Is that a fair statement?

A. Yes.

Q. If the utility were to choose one of the outliers -- again, assuming we can agree that this is an outlier -- would that be a prudent decision? And again, I understand it's a very broad question.
A. Again, it is a broad question. As I understand it, you're asking me if they had chosen one of the outliers -- meaning the upper limit of the distribution of those prices or whatever we're looking at in this question -- and relied exclusively on that --
Q. Correct.
A. -- would that have been imprudent? That's difficult to say. Certainly, I think best practice requires the consideration of uncertainty and a range of outcomes, not a single outcome. But I think in your question, you probably have the answer, which is: You've told me that others produced this range of forecasts, and the estimate that the Company relied on was within that range, even though it's an upper end of that range. I think that speaks to the fact that the assumption made by the Company was within the

range of what others would have done. So, unless one could conclude that that outer limit or that upper end of the forecast range was produced by somebody in an unreasonable fashion or by an unreasonable person, then adopting that figure would have been a reasonable result.

Q. A different way of asking that question: Is there some obligation to be conservative on the part of the utility managers, so that maybe, again, as a general rule, you should shy away from those, what I call "outliers"?

A. Well, in fact, being conservative may mean embracing those outliers. When you're talking about needing to maintain the reliability and security and integrity of the electric system, and ensuring that you can meet demand under a wide range of assumptions, including extraordinary peaks, including peaks in pricing, it may mean, in fact, that you do need to consider that type of extreme event or outlier in order to be conservative. I would not want to equate building a resource plan around an assumption of an extreme event as being anything other than conservative. That's the nature of resource planning with reserve markets and with allowance for uncertainty.

Q. Well, let's take that decision to not a resource plan, but a decision whether to invest a lot of money in a capital project. And of the range of options in front of you, one out of six results in an economic benefit. Again, assuming they're all -- you know, that's what economists do: They give you best case, give you worst case and a couple in the middle, and you're putting money at risk. Is it still the case that we would embrace the outlier?

A. Again, it's going to depend on the specifics of the circumstance. And it's hard to separate that question from the facts we've all looked at in this case.

I'm familiar with very recent cases, current cases, where other utilities are confronted with the same exact question: Should you continue with a project where you've gone from six out of seven cases being favorable to two out of seven cases being favorable in terms of economics alone?

I am watching a case right now in Florida that I'm participating in, where Florida Power & Light is facing that exact question with regard to pursuing a new nuclear plant at the south end of Florida. Their view is: Even though the economics have shifted and are now in a situation where the majority of the cases may not produce economic benefits, when you look at reliability of supply, when you look at stability of price, when you look at environmental benefits, all of which are associated with nuclear over coal or natural gas in that market, that continuing with the project makes sense. The Commission, the Florida Commission, has affirmed that decision. It actually reviews that decision each and every year, and has for the last six years. And it has said, even with the deterioration of what I'll call the "price elements of the project," continuing with the project makes sense for other reasons. And I think, as I've said here, there were other reasons present here, too, in terms of reliability, environmental stewardship, even economic development. So, I don't think you would make the decision based on price alone.

Q. In the Florida case, it sounds like the utility was regularly updating and reviewing the various changes that were going on with that project. Is that fair to say?

A. It was. And under the law in Florida, the utility there has to provide an update once a year to the Commission. I'm aware that there were updates provided here as well. And the Commission and interested parties can participate in that case in Florida.

Q. Is it part of a utility's prudency obligation to be candid with such updates and presentations to the regulator?

A. Yes. I think being candid with your regulator, especially when you're presenting information in a regulatory proceeding, is important.

Q. And is that also true for presentations made to policymakers, such as legislators?

A. Yes, I think being candid and forthcoming is important. I'll leave it at that.

CMSR. HONIGBERG: Wait, Mr. Sheehan. Let's go off the record for just one second.

(Discussion off the record.)

CMSR. HONIGBERG: Let's go back on the record.

BY MR. SHEEHAN:

Q. And as part of that duty of "candor," which is my label, does that include the duty to correct what may be misinformation presented to either a Commission or a legislator?

A. In your example, presented by others or by the utility?

Q. By others. And I would say -- in this case, I'll be specific. There is evidence that, at the time the Scrubber Law was passed, statements were that it would not exceed $250 million. And PSNH's position in this case has been, in effect, that was an estimate, a good-faith estimate that changed over time. There's letters from a state Commissioner that says PSNH says it is "not to exceed $250 million," which could be seen as a mischaracterization of what PSNH actually said.

Does PSNH, in that situation, have an obligation to say, No, the Commissioner of X was wrong. It really is an estimate. It's not -- you know, that's the basis for the question.

A. Again, you're obviously not asking for a legal opinion here, in terms of a legal obligation or duty.

Do I think it's good regulatory practice to keep the record as correct as possible? Yes. If I saw that type of statement made, and I thought it was material to the matter being considered, I would seek to correct it.

Q. I'm going to ask you a couple questions about what you think the Commission could do upon findings of imprudence.

Let's assume for the moment the Commission were to decide the Company was prudent in going forward with the Project and spending the money it spent, 400-and-some-million dollars, but the

Commission were to find imprudence in some actions taken along the way. And candor has been one of them that has been discussed in that case.

So what we have is it was a prudent decision to go forward; they spent the money well; but there were instances of not being candid or not correcting what should have been corrected, that kind of imprudence that is difficult to tie to a dollar amount. Do you understand the -- so the question is: What options would the Commission have in an ultimate order of, on the one hand they were prudent in spending money, on the other hand, there were actions that were not prudent?

MR. GLAHN: This is asked as a pure hypothetical; correct?

MR. SHEEHAN: Correct.

A. I'm going to answer it, actually, not as a hypothetical, but in the case of a very specific example that I was involved in.

As the independent prudence auditor for the nuclear projects in Florida, that issue came before me directly, where I felt that the company -- in that case, Florida Power & Light -- had not been candid and forthcoming with the Florida Commission with regard to a cost estimate. My report to the Commission made that statement that I thought the company had not been fully honest and candid and forthcoming with that information, and I basically chastised the company for that. I indicated that I felt that that action had no impact on the prudence of the costs that had been incurred for the project. It didn't cause the project to be more expensive than it otherwise would have been. But I felt that their conduct had been unacceptable. The Commission approved all of the cost recovery in that case after having heard my evidence and my report, despite the fact that intervenors had asked for a major disallowance on the grounds of what they were labeling as "perjury." The Commission did grant full recovery, did reprimand the company for not having been fully forthcoming with its cost estimates and said don't let it happen again. And that what was the end of it, at least the end it for the time being.

It's the kind of issue that can always come back when the company wants to evaluate the quality of management in establishing a return-on-equity allowance in a rate case or something like that. Many states look to management performance as an element in determining what is the appropriate return to be granted. But I've not seen a case in which that type of position led to a disallowance on the grounds of prudence. And in the case I was involved in, where I made the recommendation to pass the cost through, but to note the deficiency, that is what the Commission in Florida did.

Q. So you're not aware of a situation where this kind of imprudence resulted in a disallowance.

MR. GLAHN: Objection. I don't think there's -- his question wasn't -- I don't understand what he means by "this type [sic] of imprudence." If his question is, is a lack of candor, per se, imprudence, well, then he can ask that question.

CMSR. HONIGBERG: I don't think he was even close to that question.

Do you want to clarify your question, though, Mr. Sheehan?

MR. SHEEHAN: Sure.

BY MR. SHEEHAN:

Q. You just gave an example of where you recommended a finding of imprudence based on what you said was "perjury" in that case and what may have been considered lack of candor of the facts, some version of the facts in this case. So that was what I say as "this kind of imprudence."

My question was: Are you aware of whether there has been -- of a situation where a Commission has made a disallowance based on imprudence of that nature?

A. The short answer is no. But since this is a public record, I have to clarify that I did not label the action as "perjury."

Q. Understood.

A. And I did not label it as "imprudent." I labeled it as a "lack of being forthcoming and being candid." But I am not aware of a situation similar to that where a Public Utilities Commission disallowed an investment or disallowed the recovery of an expense on the grounds of a failure to be candid or a failure to provide the most current information.

Q. Are you aware of other steps, other than an admonition, that a Commission have taken in those kinds of situations, such as reducing the rate of recovery or the like?

A. I'm not aware of anyone who has disallowed costs or reduced the rate of recovery. I have seen management performance, including staying on top of changes in costs and things like that, as being an element of establishing the allowed return on equity as a management matter in rate cases. That's rare, and it takes a pretty major issue to come before a Commission before they're going to reflect that on a return on equity.

MR. SHEEHAN: That's all the questions I had. Thank you.

CMSR. HONIGBERG: Who's going next? Ms. Chamberlin.

MS. CHAMBERLIN: Yeah. Thank you.

CROSS-EXAMINATION

BY MS. CHAMBERLIN:

Q. Mr. Reed, I'm Susan Chamberlin for the Consumer Advocate for the residential ratepayers. Good morning.

A. Good morning.

Q. Now, you just went over the Florida case. Did you make a recommendation of a prudence-based disallowance in that case?

A. I made a recommendation that there not be a prudence disallowance on the grounds that the conduct of the company that I questioned did not lead to any higher costs or any imprudent action.

Q. Going through your past experiences which are listed in JJR1, can you recall a time when you made a financial disallowance recommendation?

A. Yes. The largest prudence case ever conducted in the United States was in Texas, which is called "Docket No. 9300." That was a case in which approximately $16 billion of costs were being reviewed for prudence by the Texas Public Utilities Commission. I was one of two auditors hired by the Commission in that case to conduct the prudence review. One side was on nuclear construction costs; the other side was on gas purchase costs. In that case, which is, I think 1989 maybe -- actually, a little bit later, but many years ago -- I recommended a disallowance in excess of $400 million to the Commission, based upon the conduct of what was called Texas Utilities Fuel Company, which was actually, at that time, the largest gas purchaser in North America. So I worked for the Commission -- or for the Commission Staff and General Counsel, recommended a multi-hundred-million-dollar disallowance. The Commission did disallow about half of that amount on the gas side.

Q. And do you recall what behavior led you to conclude that it was due a disallowance?

A. Yes. They had made very gross errors in contract practices, in contract management. They had neglected to manage contracts in a timely manner. This includes, for example -- contracts in those days had what were referred to as "market out-clauses," fixed-price gas contracts where you could unilaterally say the market has changed and go back and seek to impose a new cost. I remember vividly one $30 million contract where, literally, the contract -- they were still using paper contracts and paper contract management systems -- the contract had fallen behind the filing cabinet. And they forgot to exercise their market out, leading to more than $15 million of higher costs for customers by a clerical omission. That was the kind of thing I thought was clearly imprudent.

Q. In your testimony -- it's Bates 239 -- Lines 23 and 24, you state that PSNH --

A. I'm sorry. What page reference are we on?

Q. Bates 239.

A. Could you give me the --

CMSR. HONIGBERG: It's Page 21 of your testimony.

THE WITNESS: Thank you.

MR. GLAHN: Mr. Reed, it's probable that the copy you have there has Bates numbers in the bottom right-hand corner as well, if that helps.

THE WITNESS: It says 000023.

MR. GLAHN: That's right. It's --

(Court Reporter interrupts.)

THE WITNESS: And the last digit is cut off, unfortunately.

MR. GLAHN: So, again, what's the Bates number, Susan?

MS. CHAMBERLIN: It's 239.

MR. GLAHN: It's Page 21 of your testimony.

THE WITNESS: Yes, I have that.

BY MS. CHAMBERLIN:

Q. At the bottom of the page, you state that PSNH concluded that Merrimack would continue to be a cost-effective base-load resource; is that correct?

A. Well, specifically, I said that PSNH concluded that pursuit of the Scrubber would allow Merrimack to continue to be a

cost-effective base-load resource.
Q. And in that instance, "cost-effective" means revenues received are greater than the cost to operate?
A. No, not necessarily. That would be equivalent to saying it's going to be a least-cost resource. Cost-effective means that the price you're paying fairly reflects the value you're receiving. So, value can be fuel diversity; it can be energy reliability, instability; it can be price. So, in my mind, cost effective means just what I said, that the value fairly reflects the benefits or attributes you're receiving.
Q. So you don't believe that revenues greater than operating costs is the most important element. Or do you believe that it's an element, but not the most important one?
A. A comparison of revenues and cost is an element, and I think it's an important element. It is certainly not the only element.
Q. Okay. You concluded that -- you've used the phrase "base-load resource." And a

reasonable estimate for a capacity factor for a base-load plant would be about 70 percent? Is that a fair estimate?
A. Well, maybe even 60. But something north of 60.
Q. And on Bates Page 248, that's where you discuss divestiture.
A. This is paper Page 30?
Q. Yes. And are you stating that Merrimack plant was a "weak-performing" or "high-risk" plant?
A. Do you have a reference to a specific line number on that page?
Q. Yes. You're talking about PPAs. I have it right here. Hold on.
A. If I could help? You're probably on Line 8 of Page 238?
Q. Yes, that's exactly right.
A. And my opinion is, in this time frame, which is referenced, actually, on the bottom of the prior page -- that is, the 2010 time frame -- I would describe Merrimack at least as being a "high-risk" plant, with regard to environmental regulation and with regard to

fuel costs. "Weak-performing" is a relative term. I would have said at that time it was a unit that was "economically challenged" by the significant downturn in gas prices that had occurred in the outlook forecast prices, as well as environmental regulation. But this is -- we're talking about 2010, maybe mid-2010.

Q. And you believe that that characterization was different, say a year earlier, in 2009?

A. Yes, very definitely different at the time of the legislature's consideration of the alternatives bills and in 2008.

Q. So, in 2009, there was not a high risk of environmental compliance costs?

A. I think that continued to evolve as the nation considered new approaches to carbon regulation, as well as to haze and particulates, but -- so I would say it increased. To me, the greatest change, though, was not in environmental regulation; it was in the outlook for fuel prices, and, therefore, power prices.

MS. CHAMBERLIN: Okay. Thank

you. That's all I have.

MR. PATCH: No questions.

CMSR. HONIGBERG: Mr. Irwin.

MR. IRWIN: Yes. Thank you.

CROSS-EXAMINATION

BY MR. IRWIN:

Q. Mr. Reed, my name is Tom Irwin. I represent the Conservation Law Foundation. Good morning.

A. Good morning.

Q. If I could please direct your attention to Page 12 of your testimony. That's Bates 230, Line 5.

A. I have that.

Q. Okay. So you say in your testimony, "Prudence decisions cannot be evaluated based on whether they were expected to, or in fact did, provide a 'benefit to ratepayers.' First, whether a project or decision produces 'benefits' to ratepayers can only be determined after the fact." Did I read that correctly?

A. Yes.

Q. Is it your opinion that it's impossible to prospectively assess a project's foreseeable costs or benefits?

A. No.

Q. So you would agree that a prudent manager can prospectively take into account potential costs, such as regular -- future regulatory costs in assessing the value of an investment.

A. You asked can a prudent manager take consideration of potential costs. In that case, yes, it can.

Q. So, a prospective analysis can and should be done; correct?

A. For what purpose?

Q. A prospective analysis of the benefits and costs of an investment in a major capital infrastructure.

A. Yes, I believe it's reasonable and important to conduct an analysis of potential future costs and benefits when assessing the appropriateness of a major capital expenditure.

Q. Okay. Thank you. Moving on, down at -- I'm sorry -- Line 11 on the same page of your testimony, you state, "The existence of 'benefits' may be a subjective matter that is not capable of being examined based on a factual inquiry limited to information that was available at the time for the decision maker." Did I read that correctly

(Witness reviews document.)

A. Yes.

Q. And then you go on to provide an example. You say, "For example: Utilities 'choose' to pay federal income taxes because the law requires that they do so. The decision to comply with this law may not be one that some, or even most ratepayers believe produces 'benefits' for them." Did I read that correctly?

A. Yes.

Q. Now, did you -- do you interpret Dr. Stanton's testimony to be calling for a subjective analysis of what ratepayers may or may not believe to be beneficial to them?

A. Her position calls for an analysis of benefits determined after the fact. Whether that's objective or subjective depends on the analysis being done. But the statement in her evidence is that prudence requires a utility manager to restrict capital expenses for which he or she plans to seek recovery from ratepayers to those projects that are beneficial to ratepayers. So that was the portion of her evidence that I was objecting to. That is the analysis, I believe, her evidence calls for.

Q. And you would agree, however, that Dr. Stanton has conducted a cash-flow analysis taking into account reasonably foreseeable factors, such as future regulatory costs and, as you indicated a few moments ago, the very important issue of fuel costs, natural gas costs.

A. If we can take the word "reasonable" out of the question, I think I can probably agree with you. I'm not offering an opinion on the reasonableness of her assumptions with regard to environmental costs or fuel costs. I agree that she has conducted a cash flow -- or specifically, a discounted cash-flow analysis of the project.

Q. If you could please turn to Page 23 of your testimony.

A. I have that.

Q. So, on Page 23, starting on Line 15, you indicate that the "most reasonable time frame in which the Legislature could have reviewed its decision to require installation of the Scrubber would have been in the 2008/early 2009 time frame."

Mr. Reed, if you would assume for purposes of this question that a utility manager in the position of PSNH at that time had a responsibility to assess the prudency of making the investment -- so we're setting aside opinions related to whether there's a mandate -- would you agree that that 2008/early 2009 time frame was a critical time frame for purposes of such a review?

A. Let me make sure I understand your question. You're asking me to assume away any mandate or law that would compel a decision or undertaking with regard to the capital expenditure, and you ask is this time frame of the second half of 2008, the first quarter, perhaps, of 2009, an important time frame for evaluating that decision because of the degree of uncertainty that was occurring. I agree with that. I accept that.

There was a large degree, a very large degree of uncertainty with regard to natural gas prices. We saw, of course, there was also a change in the capital cost estimate for the project. Both of those contribute to uncertainty. So, I think it is appropriate and important to conduct analyses that capture that. I think the Company did do that. But you've also asked me to assume some counterfactual elements in your question that I think are just that, counterfactual.

Q. Thank you. Turning to Page 19 of your testimony, please.

A. I have that.

Q. And in particular, the entry on this table dated 12/31/2008.

MR. GLAHN: I'm sorry, Tom. What page are you on?

MR. IRWIN: I'm sorry. This is Page 19, Bates 237.

MR. GLAHN: Thank you.

BY MR. IRWIN:

Q. The entry dated 12/31/2008 states, "PSNH executes more than $225 million of the $340 million in contracts for the Scrubber Project."

Now, you did not, prior to the preparation of this report, review the contracts at issue; correct?

A. The actual construction agreements? That's correct.

Q. Okay. In fact, that entry was based on information provided to you by Mr. Smagula of PSNH?

A. It was, I believe, developed by Mr. Smagula. It was provided by counsel to me.

Q. So I assume it's fair to say, having not reviewed the agreements, that you had not reviewed or didn't have independent knowledge of termination clauses that may have been present in such agreements.

A. It's fair to say I relied on the information request/response that was submitted in this case by PSNH, I think developed by

Mr. Smagula, which spoke to the different categories of committed costs.

Q. If I could turn your attention to Page 34 of your testimony, Bates 252.

A. I have that.

Q. Starting at Line 10, you state, "First, while Dr. Stanton acknowledges that PSNH had incurred $23 million" --

(Court Reporter interrupts.)

Q. "First, while Dr. Stanton acknowledges that PSNH had incurred $23 million in engineering and planning expenses by March of 2009, she fails to recognize that PSNH had already contractually committed to $225 million of the $340 million in contracts for the Scrubber Project by the end of 2008."

So, again, those numbers are not based on any independent analysis by you of contracts at issue.

A. That's correct. It's based on my review of the information request/response submitted by the Company.

MR. GLAHN: And I'd just note that the sentence that Mr. Irwin read has a semi-colon, and the sentence goes on, if you want to read it. But it goes on from there.

CMSR. HONIGBERG: The record is clear it's his testimony. People can read the rest of the sentence at their leisure.

Mr. Irwin.

BY MR. IRWIN:

Q. Mr. Reed, when were you retained to assess the prudence of PSNH's investment in the construction of the Merrimack Station Scrubber?

MR. GLAHN: Objection. I'm not sure that that's exactly what he said he was retained to do. It's clear in his report, and he talks about prudence of --

CMSR. HONIGBERG: The real question is, "When were you retained?" Right?

MR. IRWIN: Yes. Strike that.

BY MR. IRWIN:

Q. I'll just ask -- you weren't retained to assist in the management decisions as they were being made by PSNH with respect to the Scrubber; correct?

A. That is correct.

Q. So you were retained after the fact to provide opinions retrospectively on the prudency of PSNH's actions.

A. That's correct.

MR. IRWIN: Thank you. I have no further questions.

CMSR. HONIGBERG: Thank you. Mr. Fabish.

MR. FABISH: Just a couple questions.

CROSS-EXAMINATION

BY MR. FABISH:

Q. My name is Zach Fabish. I'm an attorney with the Sierra Club.

Without getting into -- strike that.

So, your testimony talks about, in part, some options that may or may not have been available to PSNH as it concerns the development of the Scrubber Project; correct?

A. It does, yes.

Q. Are you familiar with the rebuttal testimony filed by PSNH from Bill Smagula?

A. Yes, I am.

Q. Are you familiar with Page 29 of that testimony?

A. I don't have that document up here with me.

(Mr. Sheehan hands document to witness.)

MR. GLAHN: Zach, what's the number? Is it 29?

MR. FABISH: Yeah, 29.

MR. GLAHN: Do you have a Bates number for it?

MR. FABISH: Bates No. 000029.

MR. GLAHN: Bunch of zeros and 29.

A. Just to be clear -- I'm sorry. Is this the direct or the rebuttal?

BY MR. FABISH:

Q. This is the rebuttal.

A. Okay. Let me find that document. Give me just a moment.

CMSR. HONIGBERG: Let's go off the record for a minute.

(Discussion off the record)

CMSR. HONIGBERG: Let's go back on the record.

BY MR. FABISH:

Q. So, do you have that in front of you?

A. I do.
Q. Great. Could you take a look down around Lines 20 through 22. Do you see where the testimony indicates that there was testing of activated carbon injection at Merrimack that achieved mercury reduction, with peak reduction levels of 50 to 60 percent? Do you see that?
A. I see testimony that I believe was stricken to that effect.
Q. Oh, was it? My apologies.
MR. GLAHN: That's what my notebook shows as well.
BY MR. FABISH:
Q. Okay. Well, then, as a hypothetical --
CMSR. HONIGBERG: I'm sorry. What's the hypothetical then? Assume for a moment what?
MR. FABISH: Assume for a moment that PSNH tested activated carbon injection technology at Merrimack Station and was able to achieve some level of mercury reduction.
CMSR. HONIGBERG: Okay. That's

the assumption. What's the question?

BY MR. FABISH:

Q. Did you consider as one of the alternatives in your testimony, reducing some of the mercury in conjunction with the Scrubber through ACI technology?

MR. GLAHN: I mean, I think we're at a point now where, if they want to ask this stuff -- they moved to strike it out.

MR. FABISH: I didn't --

MR. GLAHN: If they want to open this door, it seems to me it comes back in.

CMSR. HONIGBERG: Well, I think others might want to weigh in on this.

Mr. Fabish is asking a hypothetical question that is based on testimony that was struck at the request of another party. So, Ms. Chamberlin, do you want to weigh in on this at all?

MS. CHAMBERLIN: Yes. I certainly don't believe it brings the testimony back in. The Commission has ruled that it's stricken, and it's stricken. If he wants to argue that it's irrelevant, the question is relevant or improper, that's fine, but it does not open the door to bring the testimony back in.

CMSR. HONIGBERG: Does anyone else want to weigh in?

(No verbal response)

CMSR. HONIGBERG: Mr. Fabish, I think you can ask the hypothetical.

MR. FABISH: Should I reask or --

BY MR. FABISH:

Q. Mr. Reed, do you --

CMSR. HONIGBERG: Do you have the question, Mr. Reed?

THE WITNESS: I need the question again.

BY MR. FABISH:

Q. Okay. Did you evaluate as part of your testimony an option in which PSNH, in conjunction with the Scrubber, reduced some of the mercury reduction prescribed by the Legislature through the use of activated carbon injection?

A. I'm glad I had the question read back because there's no mention of a "hypothetical" in that question. So I'll answer it the way you asked it.

I was aware of that. I did not consider one of the alternatives that was available to the Company after the passage of the Clean Power Act to be the use of a technology other than a wet scrubber. From my perspective, I viewed that as being one of the mandates of the Act and not being subject to substitution by the Company on its own.

Q. So, for purposes of your testimony, your understanding of the Clean Power Act was that the only permissible way to reduce mercury at the affected units was through the use of a wet scrubber?

A. Again, I'm not going to offer a legal opinion. It is my view that the Act called for that technology. And I'll just leave it at that.

Q. Okay. Can you take a look at your testimony at Page 18, which would also be Bates 000236.

A. I have that.

Q. Okay. Just looking at the question and answer at Lines 9 through 10, I just want to clarify that's what you meant with your answer to the preceding question.

(Witness reviews document.)

A. It's the same Act, if that's what you mean.

Q. No, that's not what I mean. That's fine, though. Let me move on to the next question.

So, consistent with your testimony, your understanding is that the only thing the Clean Power Act allowed for reduction of mercury was construction of a wet scrubber.

A. Yes, that is my understanding.

Q. Okay. So, hypothetically speaking, using coal -- in addition to building a wet scrubber, using a coal that contained less mercury and thereby achieving some level of mercury reduction by burning a slightly cleaner blended fuel, that was not an allowable alternative under the Clean Power Act?

A. We need to go back to the beginning of that question. I thought you said, "in addition to using a wet scrubber" --

Q. Correct.
A. -- which means you would supplement the use of a wet scrubber with fuel substitution to a different quality or tech spec for coal?
Q. Correct.
A. I think that probably would have been a possible action. It doesn't relieve the need to build the Scrubber. But I think you could supplement the Scrubber with a fuel substitution.
Q. Okay. Could you supplement the Scrubber with activated carbon injection?
A. That goes beyond my expertise.
Q. Okay.

MR. FABISH: All right. I think that's all the questions I have. Thank you very much.

CMSR. HONIGBERG: Commissioner Iacopino.

INTERROGATORIES BY SP. CMSR. IACOPINO:

Q. Mr. Reed, I believe I heard you testify in your opening statement that, as the range of uncertainty increases, the range of reasonable responses increases. Is that

correct?
A. Yes, that is my statement. I think that's an important point and one very relevant to the circumstances of 2008 and 2009.
Q. Well, have you ever heard the phrase, "the devil you know..."?
A. I have.
Q. And generally, I mean, that stands for the proposition that in times of uncertainty, you would stick with what you have and not look at a broad range of things; isn't that correct?
A. No, I don't accept that.
Q. Well, tell me why.
A. I think that the nature of uncertainty -- if you're seeking to maximize welfare or achieve a desired result, what that suggests to me is that the "devil you know" or the "status quo," which may have been acceptable and satisfactory in terms of the results it produced before, may no longer produce satisfactory results because the environment is changing. And from my 38 years in utility planning, when you have created uncertainty,

whether it's inflation -- I remember days when inflation was 16 and 17 percent -- or whether it's uncertainty about natural gas prices or equipment prices, that is when reasonable people tend to differ most with regard to the response they want to make. It is that range of what reasonable people do that define the acceptable range of prudent or reasonable conduct. So, because everyone -- when you have a dramatic change in circumstances, everyone perceives those circumstances differently. They perceive changes differently. They perceive the likely path forward differently. So, at least in my experience, under those circumstances, the responses that people make and the choices they make tend to diverge from a sort of central or normal tendency. That's why I say the range of reasonable behavior expands as the degree of uncertainty expands.

SP. CMSR. IACOPINO: I have no other questions.

CMSR. HONIGBERG: I have no

questions.

Mr. Glahn, do you have any redirect?

MR. GLAHN: I do.

REDIRECT EXAMINATION

BY MR. GLAHN:

Q. Mr. Reed, let me first go back to Mr. Fabish's questions. All the questions he asked you, I think, assumed that the Scrubber would also be installed along with activated carbon.

Were you aware that in 2005 and 2006, PSNH evaluated the use of activated carbon at Merrimack Station?

A. Yes, I am aware.

MS. CHAMBERLIN: Your Honor, I object. That's the stricken testimony.

CMSR. HONIGBERG: Sustained.

BY MR. GLAHN:

Q. Okay. Let's go back to square one, which is, both the Staff and Mr. Irwin asked you to assume that the law didn't exist. Do you think that a prudent utility making the decisions that PSNH made in constructing the

Scrubber was entitled to assume the law didn't exist?

A. No. I don't think any manager has the ability to assume away existence of a law.

Q. And I think you were asked by the Staff to make a conclusion or to -- you were asked whether a -- what would happen to a utility that made a reasonable misinterpretation of the law. Do you recall that?

A. Yes.

Q. I want you now to assume something a little bit different.

On the issue of installation of the Scrubber, do you think a prudent utility could assume that the Scrubber need not be installed when the body responsible for regulating the utility indicated that the Legislature had passed a law that did not establish an alternative to installing the technology? In other words, same assumption, but now the utility has to interpret the law. But the body responsible for regulating the utility at the time that they're making the decision says there's no alternative to installing it.

A. I think that type of statement by a utility's regulator is the type of statement that the utility could reasonably rely upon. Obviously, if someone were to determine later that that interpretation was incorrect, it might represent detrimental reliance. But it is the type of statement I believe a utility manager is properly able to rely upon.

Q. And if it also was the case that the regulator's decision went to the Supreme Court in the state in which the regulator sat, and the Supreme Court refused to review the regulator's decision, would that, in your view, influence the prudence of the utility's action?

A. Yes. I think it would strengthen the ability to rely quite heavily on that type of a statement.

Q. Now, you were asked a question about lack of candor and imprudence. Do you recall that?

A. I do.

Q. Okay. To your knowledge, based on what anyone has told you in this case, is there any evidence in this case that there was a lack of candor on the part of this utility, in this situation?

A. Well, my answer actually goes beyond what people have told me. But what I have seen myself with regard to the documents and the evidence in front of the Commission on this case, I have seen no lack of candor by PSNH.

Q. Okay. Now I want you to assume that you are sitting as a prudent auditor, in effect, as you said you've done down in Texas, okay. And I want you to assume something else: That one of the issues of whether the utility was prudent was whether the utility actually explained to the -- told the regulator what the break-even point between gas and coal -- the spread between gas and coal was, okay. Do you have that in mind?

A. I do.

Q. Now I want you to assume that the utility -- that the staff of the utility -- or the staff of the regulating body said there was no lack of candor, okay. Take that into account as well.

A. Okay.
Q. And that the gas assumption and the coal assumption had been given to the staff of the regulator and to the regulator, and that the utility told the staff that their model was highly sensitive to the gas/coal price spread. And there's a dispute actually as to whether the spread -- just assume those facts, okay.
A. I have that.
Q. Now, in that situation, as a prudence auditor, would you say that there had been a lack of candor?
A. Certainly not on those points, no.
Q. Now let's talk a little further about lack of candor. I want you to assume that there was a lack of candor, but that there were proceedings before the regulatory body in which there was an ability to ask the utility any questions the regulators wanted, about anything they wanted. Would that influence your decision as to whether the conduct of the utility was imprudent, even if there was a lack of candor?

A. As I understand your question, you asked me to assume that there was a lack of candor?

Q. Assume there was a lack of candor, but then there were proceedings in which the decision around which the lack of candor was addressed, was subject to review by both the regulator -- start with the regulator.

A. Okay. I have that in mind. And your question is how does that influence my judgment on whether the utility was prudent or imprudent?

Q. Yes.

A. Again, I define "prudence" as being conduct within a range of reasonable behavior. If a reasonable person under those circumstances could expect and understand that the information was going to come into the record through others, through intervenors, through cross-examiners, through either an administrative body or legislative body asking questions, then I don't see that conduct as being very problematic. Beyond that, though, there's also the question of causation. You know, is the failure to disclose that information going to lead to any type of imprudent cost being incurred or any, again, detrimental effect? It's not enough to simply say someone failed to disclose information. You also have to look at what's the effect of that disclosure, if any. As I said, in Florida, I was quite critical of the company's failure to disclose; yet, I, as the independent expert in that case, did not conclude that there were any cost consequences of that. And that's frequently the case. You don't see an expenditure or a resource plan decision typically turn on one piece of information.

Q. Speaking of "one piece of information," I want you to make another assumption for the moment, and that is, that a utility bases its fuel price projections -- let's take the case of natural gas fuel price projections -- on just one price. I just want to you assume that's the assumption for the moment.

CMSR. HONIGBERG: Mr. Glahn, did anybody cross the witness on this topic?

MR. GLAHN: I think they asked

him about prices and whether there were expected -- and specifics of relying on one decision.

CMSR. HONIGBERG: Go ahead.

A. I have that in mind.

BY GLAHN:

Q. Assuming that were true, would that be, per se, imprudent?

A. No.

Q. For example: Would reliance on NYMEX futures prices, even if that were the sole basis for the decision, be, per se, imprudent?

A. No, not at all. NYMEX futures prices are actually very reliable information, and information that many utilities do rely on.

Q. Do you know, for example, whether TransCanada relies on those prices?

MS. CHAMBERLIN: Your Honor, I object. This really wasn't gone into on direct.

CMSR. HONIGBERG: Sustained.

BY MR. GLAHN:

Q. To go back to Commissioner Iacopino's question about the "devil you know," there

was a great deal of uncertainty in the marketplace in the fall of 2008 and the early part of 2009; is that correct? I think we've all agreed to that.
A. Yes.
Q. Have you seen anything in this case that would cause you to believe that PSNH was -- acted imprudently in going forward to construct the Scrubber, notwithstanding the uncertainties in the market, based on what it knew or could have known in the fall or spring of 2008?
A. No. To the contrary, my investigation and analysis led me to conclude the contrary, that the Company was prudent.
Q. I want you to make another assumption about prudent behavior and the law.
    If you were advising a utility in the fall of 2008, and the law that exists in this case existed -- now I want to assume the real case -- that, in fact, a utility was acting under the -- whether it's a mandate, whether it's a constraint, doesn't matter what we call it; the law is there. The utility comes

to you and says, "I'm considering retiring the plant." What advice would you give that utility?

A. I would have said that I don't think that option is available to you. I would have said, even without the law, retirement of a unit in New England is something that requires ISO-New England's approval. And that's a long and often bitterly fought proposition. But beyond that, I see the law as requiring the installation of this Scrubber. So I don't see that retiring the unit is a valid means of complying with the law. It certainly, to me, seems to thwart the Legislature's intent or -- I won't say "intent," but the Legislature's statements with regard to the Scrubber being in the public interest.

MR. IRWIN: Your Honor, I object and move to strike on the grounds that this was not the subject of cross-examination and that the witness is getting into issues regarding interpretation of the law. The Commission has made clear that it will address those legal issues without benefit of witness testimony.

CMSR. HONIGBERG: Mr. Glahn.

MR. GLAHN: This witness has been asked a whole series of questions to assume that certain facts that in fact do exist, didn't exist. I think it's fair to ask the witness, given what did exist, what in his view should a prudent utility have done.

CMSR. HONIGBERG: And that is the subject of his testimony. I think we've got the subject of testimony. And asking him to repeat the direct testimony that he's given isn't particularly useful. People were -- I think other parties, intervenors, Staff, were probing, "well, assume certain other things, how would that change." I think the witness has answered those questions thoroughly. If all you're doing is asking him to go back to his direct testimony, we don't need to do that.

So, is there something beyond that you want to do that was the subject of cross-examination?

MR. GLAHN: Let me take one minute.

(PSNH Counsel confer.)

MR. GLAHN: I withdraw my question, and we're all done.

CMSR. HONIGBERG: Thank you very much. Thank you, Mr. Reed.

I think that's all we're going to do for now. We'll break until... let's come back at quarter to two. That's an hour and twenty minutes from now. We'll go off the record.

(Whereupon the MORNING Session of Day 7 recessed at 12:24 p.m. The AFTERNOON Session of Day 7 is contained under separate cover so designated.)

C E R T I F I C A T E

I, Susan J. Robidas, a Licensed Shorthand Court Reporter and Notary Public of the State of New Hampshire, do hereby certify that the foregoing is a true and accurate transcript of my stenographic notes of these proceedings taken at the place and on the date hereinbefore set forth, to the best of my skill and ability under the conditions present at the time.

I further certify that I am neither attorney or counsel for, nor related to or employed by any of the parties to the action; and further, that I am not a relative or employee of any attorney or counsel employed in this case, nor am I financially interested in this action.

Susan J. Robidas, LCR/RPR
Licensed Shorthand Court Reporter
Registered Professional Reporter
N.H. LCR No. 44 (RSA 310-A:173)

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