

IN THE SEVENTH JUDICIAL DISTRICT COURT OF EMERY COUNTY  
STATE OF UTAH

HEAL UTAH, et al.,

Plaintiffs,

Case No. 120700009

vs.

KANE COUNTY WATER CONSERVANCY

DISTRICT, et al.,

Defendants.

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TRANSCRIPT OF TRIAL - DAY TWO

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BEFORE THE HONORABLE GEORGE M. HARMOND

SEPTEMBER 24, 2013

50 West Broadway, Suite 900, Salt Lake City, UT 84101  
801-983-2180

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APPEARANCES:

FOR THE PLAINTIFFS:

John S. Flitton, Jr.  
Lara A. Swensen  
FLITTON & SWENSEN, P.C.  
1840 Sun Peak Drive, Suite B-102  
Park City, Utah 84098

FOR THE DEFENDANTS:

Julie I. Valdes  
UTAH ATTORNEY GENERAL'S OFFICE  
Natural Resources Division  
1594 West North Temple, Suite 300  
Salt Lake City, Utah 84116

-and-

David C. Wright  
John H. Mabey, Jr.  
MABEY WRIGHT & JAMES, LLC  
175 South Main Street, Suite 1330  
Salt Lake City, Utah 84111



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WITNESSES:

ROBERT WALTER EVANS

Direct Examination by Mr. Wright

Cross-Examination by Mr. Flitton

REED THOMAS SEARLE

Direct Examination by Mr. Wright

Cross-Examination by Ms. Swensen

Re-Direct Examination by Mr. Wright

GLEN RUSSELL GEORGE, PH.D.

Direct Examination by Mr. Wright

Cross-Examination by Ms. Swensen

Re-Direct Examination by Mr. Wright

Re-Cross-Examination by Ms. Swensen

ROBERT GRABER

Direct Examination by Mr. Wright

Cross-Examination by Ms. Swensen

Re-Direct Examination by Mr. Wright

KENT JONES

Direct Examination by Mr. Wright

1 PRICE, UTAH; TUESDAY, SEPTEMBER 24, 2013; 8:31 A.M.

2 BAILIFF: Seventh District Court in and for Carbon  
3 County, State of Utah, is now in session, the Honorable  
4 Judge George M. Harmond, Jr. presiding.

5 THE COURT: Good morning ladies and gentlemen.

6 MR. WRIGHT: Good morning.

7 THE COURT: Please be seated. We're on the record  
8 in Case 1207009, Emery County case Heal Utah, et al. v.  
9 Kane County Water Conservancy District, et al. The  
10 record will show that counsel for both parties are  
11 present. Mr. Wright, are you ready to proceed?

12 MR. WRIGHT: Yes, Your Honor. Applicants call Mr.  
13 Robert Evans.

14 THE COURT: Mr. Evans, if you would come forward,  
15 Sir, raise your right hand and be sworn.

16 ROBERT WALTER EVANS called as a witness by the  
17 defendants, being first duly sworn, was examined and  
18 testified on his oath as follows.

19 THE COURT: Please have a seat in the witness  
20 chair, Sir.

21 DIRECT EXAMINATION

22 BY MR. WRIGHT:

23 Q. Bob, would you tell us your full name, please?

24 A. Robert Walter Evans.

25 Q. And who do you work for?

1           A. I work for Intercon Services, Inc.

2           Q. What is Intercon?

3           A. Intercon is an engineering and technical  
4 services company providing services to the nuclear  
5 power industry.

6           Q. Tell me about your professional background,  
7 educational starting prior to Intercon and, then, your  
8 professional work prior to Intercon.

9           A. All right. I have a bachelor's degree in  
10 nuclear engineering from the University of Missouri at  
11 Rolla. I've been employed by Intercon for  
12 approximately 25 years. I worked, prior to working for  
13 Intercon, for an architect-engineering firm in Chicago,  
14 Sargent Lundy Engineers, and for a consulting company,  
15 Quadrex Corporation, and I did some work in the  
16 government sector over a period of about four or five  
17 years.

18          Q. Has your professional experience been focused  
19 on nuclear energy matters?

20          A. Yes, it has.

21          Q. Describe, if you would, the kinds of tasks  
22 that Intercon has been engaged by Blue Castle in  
23 connection with its proposed project.

24          A. We have been contracted to prepare an early  
25 site permit application, which is an application

1 document that Blue Castle will submit to the United  
2 States Nuclear Regulatory Commission in order to secure  
3 an early site permit for the Blue Castle site.

4 Q. And what other experience have you had in  
5 connection with other early site permits?

6 A. I am the Vice President of New Plant Services  
7 for Intercon. I have overseen the development of four  
8 combined operating license applications which were  
9 submitted to the Nuclear Regulatory Commission as well  
10 as one early site permit application which was  
11 submitted to the NRC and, subsequently, approved by the  
12 NRC.

13 Q. Now, you were here for Tom Retson's testimony  
14 yesterday?

15 A. I was.

16 Q. Do you recall Tom described, sort of in broad  
17 outlines, where we are in the ESP process for the Blue  
18 Castle site?

19 A. Yes.

20 Q. And was that testimony accurate?

21 A. That testimony was accurate.

22 Q. Okay and we'll talk about it in further  
23 detail. I want to jump right to an important point  
24 that was raised yesterday and I think there might have  
25 been some confusion about it and that is the cost

1 involved in acquiring or preparing the application for  
2 an ESP and, then, steps beyond that. There was a  
3 figure of a hundred million dollars referenced. What  
4 is the anticipated cost of just the ESP licensing  
5 process that you're engaging in, right now, for Blue  
6 Castle?

7 A. We would estimate the ESP portion of the  
8 project to cost around forty to forty-five million  
9 dollars. The direct development of the license  
10 application is, probably, about eighteen to eighteen  
11 and a half million dollars. We have a rather generous  
12 budget for the NRC review phase, which includes both  
13 technical services, to address questions from the  
14 Nuclear Regulatory Commission during the review, as  
15 well as the fees that the applicant, Blue Castle  
16 Holdings, will pay to the Nuclear Regulatory Commission  
17 for conduct of the review.

18 Q. All right. So, forty, forty-five million  
19 dollars to get the application filed?

20 A. No. No. No. Forty to forty-five million  
21 dollars through the point of approval by the Nuclear  
22 Regulatory Commission of the early site permit.

23 Q. Right. Sorry, through approval. Now, the  
24 figure of a hundred million was used yesterday. Would  
25 you address the cost incurred when you get to that

1 level? What phase of the licensing process are you at  
2 then?

3 A. That estimate, probably, encompasses the  
4 preparation, submittal and NRC review of a combined  
5 operating license application subsequent to the  
6 approval of the early site permit.

7 Q. And what is the difference between an ESP,  
8 early site permit, and a COL combined operating  
9 license?

10 A. An early site permit is an approval by the  
11 Nuclear Regulatory Commission that a site is suitable  
12 for a proposed nuclear power plant or for a range of  
13 reactor technologies. It, essentially, resolves issues  
14 associated with the environmental conditions at the  
15 site, the site safety, the impact of the site on the  
16 proposed reactor and the emergency planning issues  
17 associated with the site.

18 A combined operating license application is an  
19 approval by the Nuclear Regulatory Commission to  
20 construct and operate a specific type of reactor at a  
21 site.

22 Q. Once you've completed the ESP process and  
23 you've achieved approval, what are the options then  
24 open to a developer of nuclear power?

25 A. Well, there are a number of options. First,



1 the holder of the early site permit can simply hold  
2 that permit for some period of time. The initial term  
3 of the ESP is 20 years. It's renewable for an  
4 additional 20 years.

5 Another option would be to pursue the development  
6 of a reactor by submitting a combined operating license  
7 application to the NRC. Another possible path forward  
8 would be to follow the old licensing process, under 10  
9 C.F.R. Part 50, and submit a construction permit  
10 application.

11 Q. And the ESP is part of 10 C.F.R. Part 52?

12 A. That is correct.

13 Q. And that's the process that Blue Castle has  
14 selected?

15 A. That is correct.

16 Q. So, once they get the ESP, they can,  
17 essentially, stop and wait for conditions to ripen, in  
18 effect, to move on to the next stage, which is the COL?

19 A. That is correct.

20 Q. When did Intercon begin its work for Blue  
21 Castle?

22 A. We began substantive work in January of 2011.

23 Q. And how is Intercon paid under its contract  
24 with Blue Castle?

25 A. Our contract is a time and materials contract,

1 meaning that we bill for the hours worked, as well as  
2 the direct costs incurred in performing the work. We  
3 issue invoices on a monthly basis and are paid,  
4 generally, 30 to 45 days subsequent to that.

5 Q. Okay. Now, let's talk about the elements or  
6 requirements for an ESP, starting with safety. Would  
7 you describe, briefly, the safety element of an early  
8 site permit?

9 A. Sure. The early site permit application  
10 includes a site safety analysis report which is  
11 prepared to address the potential impacts of site  
12 conditions on the range of reactor technologies that  
13 might be deployed at the site. So, we look at  
14 population distributions around the site. We looked at  
15 potential accidents that could affect the plant, such  
16 as transportation of hazardous materials. We look at  
17 the presence or absence of pipelines that could rupture  
18 and produce an accident that could affect the plant.  
19 We look at the meteorological conditions at the site  
20 and assess how radiological materials might be  
21 transported from the site, what kind of dose impact  
22 might affect members of the public and we look, in  
23 substantial depth, at the hydrology of the site. We  
24 look at flooding issues that could affect the site. We  
25 look at ground water and surface water and, then, we

1 conduct extensive studies to evaluate the seismology,  
2 geology and geotechnical characteristics at the site.

3 Q. And I assume Intercon has staff members that,  
4 sort of, specialize in those discreet areas, under  
5 safety for example?

6 A. We have staff members and we have some  
7 specialty subcontractors doing some work for us.

8 Q. Okay and what about the environmental report  
9 portion of an ESP? Would you describe that, please?

10 A. The environmental report is prepared to  
11 evaluate the environmental conditions at the site and,  
12 then, to assess the potential impacts of the project  
13 during construction and operation and the environmental  
14 report is a key input to the Nuclear Regulatory  
15 Commission's verification that the National  
16 Environmental Policy Act has been satisfied for the  
17 project.

18 Q. And this is all pre-environmental impact  
19 statement. Is that right?

20 A. That is correct.

21 Q. That comes—at what point would an  
22 environmental impact statement be prepared?

23 A. After the application is submitted to the  
24 Nuclear Regulatory Commission, the Nuclear Regulatory  
25 Commission will conduct an extensive review of both the

1 environmental report and the site safety analysis  
2 report. They will prepare two key documents: a safety  
3 evaluation report and a draft environmental impact  
4 statement. The draft environmental impact statement  
5 will be published for public comment. The NRC will  
6 solicit input from the public for their review and,  
7 then, the environmental impact statement will be  
8 finalized.

9 Q. And is that, more or less, a check on the work  
10 that Intercon has already done, that environmental  
11 impact statement?

12 A. Yes, it is.

13 Q. And, in the NEPA process itself, which leads  
14 to the environmental impact statement, what is  
15 Intercon's role during that process?

16 A. Our role is, primarily, to provide technical  
17 support to Blue Castle Holdings in responding to  
18 questions from the Nuclear Regulatory Commission to  
19 either clarify material in the application or respond  
20 to additional requests for information.

21 Q. Would you describe, please, for the Court what  
22 Intercon has completed—work completed to date?

23 A. The work that has been completed to date has  
24 been, primarily, the acquisition of data that is  
25 necessary to prepare the detailed application

1 documents, the environmental report and site safety  
2 analysis report. So, we've completed a broad range of  
3 studies in the field on many different subjects:  
4 socio-economic conditions around the site, around the  
5 community of Green River; the ecological conditions at  
6 the site; of the terrestrial ecology and aquatic  
7 ecology. We've completed studies of—we've collected  
8 two years' worth of data for the meteorology at the  
9 site and we've completed a very extensive  
10 characterization of the seismic and geotechnical  
11 conditions at the site.

12 Q. You heard Tom Retson testify, yesterday, about  
13 boring, for example.

14 A. Yes.

15 Q. Is that part of the data collection?

16 A. That is part of the data collection, yes.

17 Q. I think he testified about a recently  
18 purchased—is it a seismic eval—

19 A. We're installing seismic monitoring  
20 instrumentation at the site, yes, a seismograph.

21 Q. Okay, that's it, seismograph and, in the data  
22 collected so far, as far as Intercon has been able to  
23 determine, are there any indications that raise  
24 suitability questions for the Blue Castle site?

25 A. There have been no indications to date.

1 Q. What does Intercon do, in more detail than  
2 you've described so far, in terms of surface and  
3 groundwater quality issues?

4 A. We collect data, over a one year period, to  
5 evaluate the water quality and to evaluate the ground  
6 water presence or absence and the height of ground  
7 water from the various aquifers. We installed a series  
8 of monitoring wells around the site in order to  
9 evaluate the ground water. We, then, collect samples,  
10 on a quarterly basis, to evaluate the composition of  
11 ground water and what's present in the ground water.  
12 We do the same thing for surface water from the Green  
13 River.

14 Q. Now, what Blue Castle has proposed so far does  
15 not involve a discharge back into the Green River,  
16 correct?

17 A. That is correct.

18 Q. And how does that affect the ongoing work by  
19 Intercon in terms of the Environmental Analysis?

20 A. Well, it doesn't, really, affect the work that  
21 we do. We've looked at the conditions in the Green  
22 River since we're withdrawing water from that water  
23 body.

24 Q. Okay. In terms of socio-economic issues,  
25 describe some of the subparts that go into that

1 analysis.

2 A. We looked at the potential impact of the  
3 project on the conditions in the community, both during  
4 construction and operation. So, we looked at the  
5 potential impact on housing in the community for the  
6 number of construction workers that would be engaged in  
7 the process of building the unit. We looked at the  
8 impact on social services, police, fire, hospitals,  
9 emergency response capabilities, looked at the impact  
10 on schools and other social services that are present  
11 in the community.

12 Q. And you heard some testimony, yesterday, about  
13 stream environment, fish population, endangered fish  
14 issues. What sort of environmental analysis has  
15 Intercon engaged in or will, as the work continues,  
16 will it be engaged in concerning those matters, the  
17 stream environment issues?

18 A. As part of the NEPA process, we will look at  
19 the impact of the proposed project during construction  
20 and operation on the stream environment. So, we have  
21 collected data on the aquatic ecology environment,  
22 we've collected data on fish. We've done studies on  
23 mackerel invertebrates, on the [inaudible] communities  
24 that are present in the vicinity where we would expect  
25 to construct the intake structure.

1 Q. And, then, the environmental impact statement  
2 will develop, further, on those issues?

3 A. Correct. We will submit the environmental  
4 report to the NRC that includes the data that we have  
5 collected and the analysis of that data and the  
6 conclusions that we reach regarding the potential  
7 impact of the project and, then, the NRC will  
8 synthesize that information, do any confirmatory work  
9 that they feel is necessary in order to prepare their  
10 environmental impact statement.

11 Q. And we're not, yet, at the conclusion stage.  
12 We're still finishing-up the data collection stage?

13 A. That is correct.

14 Q. And you talked about the withdrawal of water,  
15 the impact on the river. That would include things  
16 like fish entrainment?

17 A. It would, yes.

18 Q. And the decision as to the kind of diversion  
19 structure used to withdraw the water from the river,  
20 those decisions have not yet been made?

21 A. They have not, no.

22 Q. And, in terms of water availability issues,  
23 what kind of work is Intercon engaged in concerning  
24 river flow and withdrawal from the river and the impact  
25 on the river?



1           A. We will look at the range of flow conditions  
2 that are present over the range for which data is  
3 available and verify that sufficient water is available  
4 to support plant operations. We do not—we are not  
5 engaged to evaluate or asses the availability of water  
6 for withdrawal from these proceedings.

7           Q. All right and, if you had to estimate, if  
8 things go smoothly, at least, when might we be prepared  
9 to actually submit the ESP application to the NRC?

10          A. We're, currently, in the process with Blue  
11 Castle of reassessing the overall schedule for the  
12 submittal. We would anticipate, probably, sometime in  
13 late 2014 or early 2015.

14          Q. Is there an emergency plan element to the ESP  
15 application?

16          A. Yes. A key finding by the NRC is that there  
17 are no significant impediments that would prevent the  
18 ability to evacuate the population in the event of a  
19 possible radiological emergency. So, we conduct  
20 extensive studies and prepare an emergency plan that  
21 demonstrates that the site is suitable with regard to  
22 the impact on the public.

23          Q. And, in terms of ESP application progress, how  
24 far are we?

25          A. We're, probably, about fifty percent done.

1 Q. What is the role that the NRC is playing,  
2 right now, in this early site permit process.

3 A. The NRC is monitoring the work that the  
4 applicant, Blue Castle Holdings, is doing. They have  
5 conducted some site surveillance reviews in order to  
6 inform themselves of the approaches that are being used  
7 and provide any feedback to the applicant that they  
8 consider is warranted regarding the scope of studies,  
9 the approach, the technical work that's being done.

10 Q. NRC has made site visits?

11 A. Yes, they have.

12 Q. How many?

13 A. They've been to the site three times.

14 Q. And, then, once the application is actually  
15 submitted, Intercon stays on in a supporting role?

16 A. We have not been contracted to do that. At  
17 this point in time, our work scope is focused on the  
18 completion of the application, but it would be a  
19 reasonable expectation, on our part, that we would  
20 continue to support the technical review.

21 Q. Okay. What is a plant parameter envelope?

22 A. A plant parameter envelope is a synthesis of  
23 the key information from a range of reactor  
24 technologies that the applicant might choose to deploy  
25 at the Blue Castle site. Since we have not selected a

1 reactor technology at this point, we need to have  
2 certain key information to inform the preparation of  
3 the application. So, things like water withdrawal,  
4 things like embedment depth for the foundations, things  
5 like overall area of the plant, things like operating  
6 staff, all the things that must be known in order to  
7 prepare an environmental report.

8 So, we look at all of that data for a range of  
9 reactor technologies and we select limiting values for  
10 each key parameter based on the range of technologies  
11 that are considered in order to provide an  
12 approximation of the range of conditions that could be  
13 present for whatever reactor technology is eventually  
14 chosen.

15 Q. Is there anything unusual to be at this stage  
16 of the process and to not yet have selected a  
17 technology, which is to say a particular kind of  
18 reactor?

19 A. No. Certainly not. Of the early site permit  
20 applications that have been prepared and submitted to  
21 the NRC, the majority have used a plant parameter  
22 envelope.

23 Q. Which gives them a range of choices?

24 A. Right. Yes.

25 Q. And, in terms of sort of a normative view of

1 the other applications you've been involved in, how  
2 would you characterize Blue Castle's approach and  
3 process thus far?

4 A. Blue Castle is well within the norms of the  
5 industry in terms of how the application is being  
6 prepared.

7 Q. Okay. Would you—do you have the exhibit  
8 binder? Yes.

9 A. I do.

10 Q. Turn to Exhibit 42, please.

11 A. Yes.

12 Q. Tom Retson talked about this document  
13 yesterday. Is this something you've seen before?

14 A. It is.

15 Q. And Tom testified that this is, sort of, just  
16 a graphic depiction of where we are in the ESP process  
17 and is this an accurate representation, would you say,  
18 of the progress so far?

19 A. This is an accurate representation as of the  
20 date that it was prepared, which was November of last  
21 year.

22 Q. Now, would you take a look at Exhibit 41?

23 A. Yes.

24 Q. Mr. Retson testified about the kinds of tasks  
25 and work that needs to be completed for the ESP and

1 prepared, at one time, a very lengthy summary and,  
2 then, this is even a further summarized version of  
3 that, but is this a sort of a general outline of the  
4 kinds of work and the tasks that need to be completed  
5 through the end of the application process?

6 A. This is a consistent summary of the major  
7 activities of the project, yes.

8 Q. So, based on the data collected and the work  
9 completed so far, do you have an opinion as to the  
10 physical feasibility of the proposed site?

11 A. All of the data that we've collected so far  
12 would indicate that the Blue Castle site is well-suited  
13 to the deployment of a range of potential reactor  
14 technologies.

15 Q. And, at this point, you don't see any  
16 impediments to continuing the ESP process?

17 A. I do not.

18 MR. WRIGHT: Nothing further, Your Honor.

19 THE COURT: Thank you, Mr. Wright. Mr. Flitton?

20 CROSS-EXAMINATION

21 BY MR. FLITTON:

22 Q. Good morning, Mr. Evans. How are you?

23 A. Good morning.

24 Q. I just wanted to follow-up, a little bit, on  
25 the progress of the ESP process. You and I met for a

1 deposition near the end of March of this year. How  
2 much additional work has been done since that time?

3 A. A modest amount of additional work. As Tom  
4 mentioned yesterday, and as I testified earlier, we're  
5 in the process of deploying a seismograph to the site.  
6 So, we have made arrangements for the procurement is  
7 adequate and that the calibration and testing of that  
8 equipment and we're in the process of installing that  
9 equipment. We've also continued some of the laboratory  
10 testing work on soil and rock samples.

11 Q. What about the analysis portion of some of the  
12 testing you've done earlier, like with the fishery  
13 issues, the national stream environment issues. Have  
14 you made progress on that?

15 A. We have not completed additional work in this  
16 area as yet.

17 Q. Okay. What about the water availability?

18 A. We have not completed any additional work on  
19 that area.

20 Q. And what's the reason for that? Just that  
21 you're busy with other things?

22 A. We're, currently, reassessing the schedule for  
23 the preparation and submittal of the early site permit  
24 application with Blue Castle Holdings.

25 Q. What does that mean?

1           A. It means that we're looking at cash flows for  
2 the completion of the project and the timing on this  
3 preparation and submittal of the application.

4           Q. Okay. So, it would be fair to say that things  
5 have slowed down, a little bit, since we talked earlier  
6 this year?

7           A. I think the progress has, generally, been  
8 consistent with where we've been at for most of this  
9 year.

10          Q. Okay. Let's go back, a little bit, and talk  
11 about the NEPA process. My understanding is that the  
12 way this process works, as far as getting this  
13 application prepared and filed, is that you collect the  
14 data and you make the analysis of that data and, then,  
15 you submit a report on each one of these [inaudible]  
16 and they're all combined, but there's a section, at  
17 least, of each one of these specific areas of concern  
18 for the NRC or parameters you have to look at. Is that  
19 correct?

20          A. That is correct.

21          Q. Okay. So, you've looked at, for example, the  
22 water availability, you said, the stream environment,  
23 socio-economic issues, safety, etc., correct?

24          A. Correct.

25          Q. Okay and, then, the NRC takes that information

1 that you presented, the data and the analysis and  
2 conclusions and, then, they incorporate that into the  
3 NEPA document?

4 A. That is correct.

5 Q. Okay and how much additional review do they  
6 typically do beyond what you presented to them in terms  
7 of additional studies or analysis?

8 A. It varies from application to application.  
9 I'm, probably, not in a good position to say exactly  
10 how much additional work that they do. Their overall  
11 review process is, generally, a multi-year process.

12 Q. Okay but, for example, you said you did four  
13 combined licenses. You've been involved with four  
14 combined licenses and one ESP, correct?

15 A. One other early site permit, yes.

16 Q. Okay and what was your experience in those  
17 processes?

18 A. The NRC did consultation with other agencies,  
19 like the U.S. Fish and Wildlife Service, the Army Corps  
20 of Engineers, other federal agencies. They looked at  
21 the—they conducted an independent evaluation of the  
22 literature that's available that describes conditions  
23 in the site. I can't remember, in any of those  
24 instances, where they conducted separate confirmatory  
25 studies of a particular topic.



1 Q. Okay. With respect to the water availability,  
2 what I thought I heard you say is that you just look at  
3 the flows and whether there's water available  
4 physically, correct?

5 A. Correct.

6 Q. Okay. You don't get into any of the issues  
7 about whether there's water available under certain  
8 rights or those kinds of things. Is that right?

9 A. That is correct.

10 Q. Okay and does the NRC concern itself with  
11 that?

12 A. I don't know.

13 Q. Okay. Let me—so, with respect to the water  
14 rights, your report is, basically, going to be to the  
15 NRC that there is water available based on your  
16 studies, correct?

17 A. Correct.

18 Q. Okay and there won't be any issue—

19 A. If that's what the studies show.

20 Q. Exactly. Right.

21 A. Yeah.

22 Q. Okay. What about your analysis of the socio-  
23 economic impacts of this project? Have you reached any  
24 conclusions yet?

25 A. We have not. We have collected the data and

1 we will be completing the synthesis and preparing the  
2 appropriate sections of the environmental report  
3 between now and the submittal of the document.

4 Q. Okay. So, at this time you don't really have  
5 any conclusions or any ideas with respect to how that  
6 study will shake out?

7 A. That is correct.

8 Q. Okay. Same thing goes for the fishery issues?

9 A. Correct.

10 Q. Okay. Do you have a conclusion, now, about  
11 the water availability?

12 A. I don't. We've collected the data and I don't  
13 know exactly where we're at in terms of the analysis.

14 Q. Okay. So, what data did you collect with  
15 respect to the water availability?

16 A. Well, we've looked at stream flows over a  
17 period of time. We've looked at drought conditions.  
18 We've looked at the general conditions in the river.  
19 So, basically, what you've looked at is stream gauge  
20 measurements, flow measurements?

21 A. I believe so. I would have to defer to my  
22 subject matter experts on the specific data that we've  
23 collected.

24 Q. Have you set up any gauging stations or taken  
25 any flow measurements in the river?

1 A. No.

2 Q. Okay. So, it's all based on what we've talked  
3 about in this trial this week?

4 A. That would be my assumption. Again, I would  
5 have to defer to my subject matter experts on the  
6 specific data that we're using.

7 Q. Okay and, then, with respect to the natural  
8 stream environment fishery issues, correct? You are at  
9 the same point with that? You've collected data, but  
10 you don't have any conclusions, yet, as to the impacts?

11 A. That is correct.

12 Q. Okay. So, none of this information has been  
13 presented to the State Engineer, previously, or used as  
14 part of the evidence in this case here, right?

15 A. That is correct.

16 Q. Okay. You also perform, sort of, an economic  
17 analysis of the project in terms of—my understanding is  
18 what you look at is you look at alternative fuel  
19 sources or energy sources, correct? And, sort of,  
20 compare those?

21 A. As part of the NEPA process, we look at  
22 reasonable alternatives to the project. So, we look at  
23 a number of different alternatives. We look at  
24 alternatives with respect to cooling sources. We look  
25 at alternative energy use that could be used in lieu of

1 the project, including no action alternatives. We've  
2 looked at alternative sites for the facilities. So,  
3 there's a range of alternatives that are considered as  
4 part of the NEPA process.

5 Q. Okay and where are you in that process?

6 A. We're still in the data collection synthesis  
7 and writing portion of that work.

8 Q. What kind of data do you collect with respect  
9 to that economic analysis?

10 A. We used generally publicly available material  
11 from the Department of Energy, the Energy Information  
12 Administration, the U.S. Nuclear Regulatory Commission.

13 Q. Okay. Is that a lengthy, difficult process?

14 A. It's a time consuming process to make sure  
15 that you have the most current data that's available.

16 Q. Okay and is there a reason that you're at the  
17 stage you're at instead of being further down the line?

18 A. Well, we have a large number of activities to  
19 complete for the project. We, generally, concentrate  
20 on those that have the longest timeline and require the  
21 greatest amount of technical effort. The alternatives  
22 analysis is something that's generally completed later  
23 in the project.

24 Q. Okay. Were you asked to try to get any of  
25 this information available for these proceedings?

1 A. We were not.

2 Q. Okay. Were you asked not to?

3 A. No. There was no discussion with regard to  
4 these proceedings, with regard to the schedule for any  
5 of the work that we're performing for the early site  
6 permit.

7 Q. Okay. You talked, a little bit, on direct  
8 about the cost of the permitting process.

9 A. Yes.

10 Q. How does the cost of this one compare to the  
11 ones that you've done in the past, the five other  
12 processes?

13 A. Generally, consistent. There are some  
14 differences here. This is a green field site and that  
15 there is no operating nuclear power plant at the  
16 existing location and the conditions, when there is an  
17 operating nuclear power plant, there's generally more  
18 data available from the period of time that the plant  
19 has been operating there and from the initial licensing  
20 process for that plant.

21 This particular project is also in the western  
22 United States where we have not done any permitting  
23 work in the United States for quite some time. So,  
24 there's more data to be collected for this.

25 Q. Okay. So, is this going to be more expensive

1 or less expensive than the ones in the east that you've  
2 worked on?

3 A. Comparable to, possibly a little more,  
4 expensive.

5 Q. Okay.

6 A. It's a difficult question to answer because  
7 we're constantly learning from the development of these  
8 applications from understanding the NRC's expectations  
9 so we can be more efficient. So, it's relatively  
10 difficult to make that comparison from one project to  
11 another.

12 Q. Okay and tell me how the cost—there's a cost  
13 component with the NRC, correct?

14 A. Correct.

15 Q. In terms of the applicant pays the cost of the  
16 NRC staff?

17 A. That's correct.

18 Q. And you said it's a multi-year process,  
19 correct?

20 A. Yes.

21 Q. Okay and how much is that cost? Is there a  
22 cost to unit associated with the NRC review?

23 A. I believe Mr. Retson, in his testimony  
24 yesterday, cited a dollar per hour cost for NRC staff  
25 time. I don't remember exactly the number that he

1 cited, but the NRC publishes that number each year  
2 based on a process that they use to determine their fee  
3 recovery from applicants.

4 Q. Okay and I apologize because I talked to a  
5 couple of people and I think you may have said two  
6 hundred and seventy-eight. I've heard a number of two  
7 eighty-five, but it's in that range, correct?

8 A. It's in that range, yeah.

9 Q. And that's per employee per hour?

10 A. Per man hour, yes.

11 Q. Okay. So, how many man hours does it take to,  
12 typically, get through this process?

13 A. I can't answer that, specifically. I believe  
14 that Blue Castle has obtained some estimates for this  
15 project from discussions with the NRC staff, but I'm  
16 not privy to that number.

17 Q. In your experience, do those estimates usually  
18 hold true?

19 A. The NRC staff review is dependent upon the  
20 nature of the project, what they have as a point of  
21 reference. So, I don't think I can make a general  
22 conclusion.

23 Q. And am I correct in remembering that you said  
24 this is a multi-year review process?

25 A. That's correct.

1 Q. Okay. You talked, a little bit, about the  
2 plant parameter envelope.

3 A. Yes.

4 Q. Okay and you said that there's a range of  
5 water requirements for these plants, correct?

6 A. That's correct.

7 Q. What is that range?

8 A. We're in the process of defining that plant  
9 parameter envelope. We had some preliminary  
10 information that we've assembled. It hasn't been  
11 through technical review. So, I don't know that I  
12 could cite numbers, specifically, at this point until  
13 we have—

14 Q. Have you worked, in the past, on plants and  
15 developed such an envelope with plants that are similar  
16 to this one?

17 A. Yes, we have. However, that's not really my  
18 area of expertise. So, I would defer—

19 Q. So, you would have that data available in  
20 terms of what the range of water requirements are—

21 A. Yes.

22 Q. --already, but you don't know what those are?

23 A. I do not.

24 Q. What about your safety plan, the evacuation  
25 plan? Have you had any findings with respect to that?



1           A. We have been in the process of collecting data  
2 and information. We perform what's called an  
3 evacuation time estimate in which we look at traffic  
4 patterns. We looked at routes for egress from the area  
5 and we've looked at the population distribution. We're  
6 about, I think, roughly halfway through that process.

7           Q. Okay. So, what kind of factors are considered  
8 in terms of the evacuation plan? Are you looking at  
9 the distances? I mean, how far do you have to consider  
10 before evacuation? What's the-

11          A. We, typically, look at 10 to 20 miles.

12          Q. Ten to 20 miles? So, you, kind of, study that  
13 whole area and see-

14          A. Right.

15          Q. Okay. All right.

16          MR. FLITTON: I think that's all I have. Thank  
17 you.

18          THE COURT: Thank you, Mr. Flitton. Ms. Valdes,  
19 any questions?

20          MS. VALDES: No, thank you, Your Honor.

21          THE COURT: Any re-direct?

22          MR. WRIGHT: Nothing further, Your Honor.

23          THE COURT: Thank you, Mr. Evans. I appreciate  
24 your time today. Next witness, Mr. Wright?

25          MR. WRIGHT: Your Honor, applicants call Mr. Reed

1 Searle.

2 THE COURT: Mr. Searle, if you would please come  
3 forward, Sir, raise your right hand and be sworn.

4 READ THOMAS SEARLE called as a witness by the  
5 defendants, being first duly sworn, was examined and  
6 testified on his oath as follows.

7 THE COURT: Could you have a seat in the witness  
8 chair, please, Sir?

9 DIRECT EXAMINATION

10 BY MR. WRIGHT:

11 Q. Reed, full name?

12 A. Reed Thomas Searle.

13 Q. Would you please tell the Court your  
14 educational background before we get to your  
15 professional experience?

16 A. Bachelor's degree in political science and  
17 international relations and a master's degree in public  
18 administration with a focus on public finance.

19 Q. And would you tell the Court about your  
20 professional background in connection with energy,  
21 generally speaking?

22 A. I worked for the State Legislature for a  
23 number of years where I was staffed to the Energy and  
24 Natural Resources Committee. I was the Inaugural  
25 Executive Director of the First Utah Energy Office. I

1 worked for a consortium of municipal utilities for  
2 about five years called the Intermountain Consumer  
3 Power Association, which was the predecessor of UAMPS,  
4 of the Utah Association of Municipal Power Systems. I  
5 was Chief of Staff for Governor Bangerter for a number  
6 of years, even though that was not—it was a period of  
7 time when there was a lot of interest and energy and  
8 the State of Utah was developing a lot of energy  
9 resources. Then, for 18 years, I was general manager  
10 of the Intermountain Power Agency who owned and  
11 operated, built the Intermountain Power Project, which  
12 was a 1950 megawatt coal fire generation station near  
13 Delta, Utah and, since 2008, I've been employed with  
14 Blue Castle.

15 Q. And what is your role at Blue Castle?

16 A. I am Senior Vice President of Business  
17 Development which entails, in conjunction with Aaron  
18 Tilton, handling political issues in the state,  
19 communications with policy makers across the spectrum,  
20 from federal to state to local officials in an attempt  
21 to secure political support, favorable legislation,  
22 resolutions of support, local permits, local  
23 participation in the permitting process. Also  
24 responsible for communications with the community, the  
25 general community in Utah and, particularly, the

1 community in this region, Carbon County, Emery County,  
2 Grand County and, then, finally, responsible for  
3 communications and relations with, primarily, the Utah  
4 utilities, the incumbent public utility, the six Utah  
5 rural electric cooperatives and the 42 or 44 municipal  
6 utilities in the State.

7 Q. What about PacifiCorp? What kind of  
8 connection and contact do you have with PacifiCorp and  
9 Rocky Mountain Power?

10 A. We meet with the executive officials of Rocky  
11 Mountain Power about every six months and share  
12 information. We have no formal relationship with them,  
13 just a lot of communications. They inform us of their  
14 plans. We are, currently, participating in what's  
15 called their integrated resource plan. That is a—it's  
16 called the IRP. It's a process that all state public  
17 service commissions require PacifiCorp to go through  
18 wherein PacifiCorp plans, with public participation,  
19 shareholder participation, rate payer participation, a  
20 plan for acquiring the resources that they need for  
21 about a ten, fifteen year period of time, in advance,  
22 and the Public Service Commission reviews that and  
23 approves it and that becomes the guideline for that  
24 utility in securing resources and in guiding the future  
25 of the utility.

1 Q. Let's talk about your work for IPA and,  
2 specifically, at the plant near Delta. Would you  
3 describe for the Court, again, the nature of that coal-  
4 fired plant and what specific areas of responsibility  
5 you had there?

6 A. Okay. Well, most immediately, the preceding  
7 seven years prior to my retirement there, I was  
8 engaged, primarily, as the unit three project manager  
9 wherein, with 44 utilities, by signed contract, we were  
10 planning the construction of a new coal-fired power  
11 plant called unit 3, a 900 megawatt unit, and I was  
12 responsible for that project. We spent, like I say,  
13 about six years in development of that project and I can  
14 describe why that project was not constructed.

15 Q. We're going to get to that.

16 A. Okay and, then, as general manager, I was  
17 responsible for, primarily, enforcing the major  
18 contracts that sort of control the project among all of  
19 the participants and all of the roles. A very  
20 complicated structure where we had 23 Utah cities own  
21 the project and I was responsible for the relationship  
22 with those 23 municipalities making sure that we always  
23 met their needs and they were part of the governance  
24 process. So, we had to educate them and get votes,  
25 hold a number of meetings with them when actions were

1 required.

2 We had a governance body called the Coordinating  
3 Committee, which comprised representation from all of  
4 the parties who had power or sales contracts, the right  
5 to take power from the plant. I was the chairman of  
6 that committee, a non-voting chairman, but I was the  
7 chairman of the committee and, so, every time we needed  
8 authorization or approval for any issues, I was  
9 responsible for the communications, scheduling the  
10 meetings, taking the necessary approvals or  
11 disapprovals and the owners, the 23 municipal entities,  
12 had elections every year to appoint members to what was  
13 called the board representing the 23 municipalities and  
14 they were responsible for approving all of the  
15 recommendations made by the users of the electricity.  
16 So, I was responsible, again, was the chairman of that  
17 committee and, so, my job was, basically, managing the  
18 contracts, communications with all of the various  
19 parties, making sure that the necessary approvals were  
20 done.

21 I, also, then, worked on the relationships with  
22 the six California municipalities that took the  
23 majority of the power.

24 We also owned part ownership in two coal mines. I  
25 was on the boards of both of those coal mines.

1 Q. Were those coal mines at least part of the  
2 source of fuel for that plant?

3 A. They were, yes. We also owned two unit  
4 trains. I was responsible to see that they were  
5 properly maintained. We had our own maintenance  
6 operation in Springville, Utah and we had to have a  
7 number of staff at that facility. We also chose to do  
8 maintenance for other companies that own railroads  
9 because we had more capacity at that plant site than we  
10 needed to maintain our own cars.

11 Q. Let me ask you about the coal issue. A number  
12 of us, as we drove up here, commented on the long coal  
13 trains we saw as we came into Price. Would you, if you  
14 could, quantify the amount of coal, for example,  
15 necessary to keep the IPP plant running to produce  
16 power?

17 A. For the ten years preceding my retirement  
18 there, that plant operated at a capacity factor, on  
19 average for those ten years, in excess of 90 percent.  
20 To do that, those plants burned approximately 150 coal  
21 cars a day and the coal cars were specially  
22 manufactured coal cars. They were made of aluminum.  
23 So, they could carry twenty percent more coal than a  
24 typical railroad coal car. So, we were burning a huge  
25 amount of coal each day and, of course, had to manage

1 all of the waste, the ash, from burning that much coal  
2 a day.

3 Q. Now, how much exposure did you have to the air  
4 quality issues that I assume came up regularly in terms  
5 of licensing and operating a coal-fired power plant?

6 A. Well, I was working for ICPA, who is one of  
7 the entities planning the Intermountain Power Agency.  
8 I was responsible for permitting the plant, the site.  
9 So, I worked on obtaining—not directly, but I was  
10 responsible for supervising the parties who had made  
11 the application for the air quality permits, as well as  
12 the other permits. When I served as the unit 3 project  
13 manager, the most important function we had was to  
14 obtain the air quality permit to build that plant,  
15 which we succeeded in obtaining and, incidentally, we  
16 were the last air quality permit granted in the State  
17 of Utah and we did—

18 Q. When was that?

19 A. That was—we obtained the permit in 2007, I  
20 believe. Yeah, 2006 or 2007.

21 Q. Okay and that was for the unit 3?

22 A. That's correct, 900 megawatt coal-fired power  
23 plant.

24 Q. And what happened to the effort to construct  
25 that unit 3?



1           A. Well, primarily, for political concerns  
2 relating to air emissions, carbon emissions, primarily,  
3 there were decisions made to abandon the construction  
4 of that plant. Again, almost exclusively due to  
5 concerns about carbon emissions from coal-fired  
6 generation.

7           Q. Now, are you familiar with other projects,  
8 coal-fired projects, that have also attempted to obtain  
9 clean air or air quality permits and that either were  
10 not successful or, for those reasons, didn't get built?

11          A. Yes.

12          Q. Tell me about a Nevco planned project.

13          A. Nevco is a group of—I'll call them merchant  
14 commercial developers. They planned a 280 megawatt  
15 power plant near Richfield, Utah. They applied for an  
16 air quality permit and, again, because of some  
17 regulations that had been imposed by the EPA in about  
18 two—I think it was either the end of 2005 or early  
19 2006. These new regulations were imposed by the EPA in  
20 response to a recommendation from the National Park  
21 Service, particularly the haze in the Grand Canyon was  
22 of immense concern to the National Park Service and to  
23 the local tourism community because that haze was  
24 impairing visibility.

25           The federal government began collecting air

1 visibility data with machines called transmissometers to  
2 determine the visibility impairment in the Grand Canyon  
3 as well as in some of the national parks in Utah and  
4 some of the other western states and, in 2005 or '06, a  
5 new regulation was adopted by the EPA exclusively  
6 dealing with visibility or the reduction of haze.

7 Nevco submitted an air quality application just  
8 slightly after those new regulations were in place and  
9 they could not achieve those regulations. So, they  
10 failed to obtain the permit.

11 Q. When was this?

12 A. This was in 2006. During that same period of  
13 time, Rocky Mountain Power, PacifiCorp at the time, had  
14 hired CH2MHill to determine whether or not Rocky  
15 Mountain Energy could be successful in obtaining an air  
16 quality permit to build new coal-fired generation at  
17 either the Hunter plant in Emery County or the  
18 Huntington plant in Emery County and the recommendation  
19 from CH2MHill is that they could not comply with the  
20 new air quality regulations.

21 At the same time, a group of six rural electric  
22 cooperatives, who own and operate the Bonanza plant  
23 near Vernal, Utah, in Uintah County, were generating a  
24 large amount of waste coal. Their demand was also  
25 growing and, so, they proposed and planned an 80

1 megawatt plant to burn that waste coal. It would both  
2 create electricity and clean-up the environment.

3 They received an air quality permit issued by the  
4 federal government because the plant is on Indian lands  
5 and, so, they were permitted by the EPA rather than by  
6 the State of Utah. They obtained a permit and the  
7 Sierra Club filed a lawsuit because they were—the  
8 Sierra Club is fairly confident that, in fact, the  
9 Bonanza plant proposal could not meet the new  
10 regulations and there was some question as to whether  
11 or not those new EPA regulations applied or not.

12 The Court determined that they were subject to  
13 those new regulations. They could not meet the new  
14 regulations. So, the Court, I guess, nullified the air  
15 quality permit for the Bonanza plant. So, at about the  
16 same time, to meet the growing needs in the State of  
17 Utah, the IPP plant was killed or terminated. The  
18 Nevco plant was terminated. The Bonanza plant was  
19 terminated and Rocky Mountain Energy's plans to build a  
20 new coal-fired unit were terminated.

21 Q. Let me stop you there. Are you aware of any  
22 plans, right now, in the State of Utah to replace or to  
23 make up for that base load power that was to be  
24 constructed at these plants?

25 A. The municipal utilities and the rural electric

1 cooperatives have failed to successfully plan and  
2 develop any generation sources to meet the needs of  
3 their planned units, all of which were scheduled to  
4 come online between 2012 and 2016.

5 Q. Are you aware—

6 A. Rocky Mountain Energy, on the other hand, has  
7 constructed some new gas plants and, so, some of the  
8 need that they had planned had been fulfilled with  
9 those new natural gas plants.

10 Q. Okay. Now, I would like to ask you about any  
11 planned or proposed coal plant closures that you're  
12 aware of.

13 A. Yes.

14 Q. At least in the Rocky Mountain region, would  
15 you identify any of those that you are aware of?

16 A. Yes. I'll answer that. With respect to coal  
17 fired power plants within about 200, 250 miles of the  
18 Blue Castle site, that's what we've evaluated and taken  
19 a look at.

20 Q. Okay.

21 A. First of all, the plant—some of you, probably  
22 saw, just ten miles north of here in Helper, called the  
23 Carbon plant, which is 172 megawatt plant, that will be  
24 closed because of newly-imposed air quality and part  
25 visibility regulations imposed by the EPA.

1 Q. When do they expect to close that plant?

2 A. The utility has determined that it's not  
3 economic to update that plant to meet those  
4 regulations. So, that plant will close in 2015. The  
5 Intermountain Power Project, which has 1,950 megawatts,  
6 by far and away the largest generating station in the  
7 State of Utah, now plans to close between 2020 and  
8 2025.

9 Q. Let me ask you, if you talk about 1,900  
10 megawatts, can you quantify that for us? How many  
11 average homes would 1,900 megawatts serve?

12 A. The State of Utah has an average load of,  
13 maybe, around 5,000 megawatts, a peak load. That's,  
14 generally, between, maybe, 2:00 and 6:00. During the  
15 summer months, it's, probably, about 6,000 megawatts.  
16 So, 1,950 megawatts is, maybe, a third of the peak load  
17 of the State of Utah. It's a lot of electricity.

18 Q. Okay.

19 A. So, that station will close, 1,950 megawatts.  
20 Just across the border, in the four corners area near  
21 Page, Arizona, the Navajo plant is in operation. The  
22 Navajo plant has announced closure of one or two of its  
23 units. They're negotiating to try to keep the shut-  
24 down to only one unit, which would be 750 megawatts.  
25 So far, they have not been successful. So, at this

1 time, the utilities involved in that project are  
2 planning for a two unit closure, which would be about  
3 1,500 megawatts taken off line.

4 Q. If both close?

5 A. If both close. In addition to that, just  
6 across the border into New Mexico is a station called  
7 the Four Corners plant. Again, within a couple hundred  
8 miles of the Blue Castle site and they plan to close  
9 one unit, which would be 900 megawatts, and that's  
10 scheduled to close in 2020.

11 So, by 2025, which is a reasonable period for  
12 nuclear to be deployed in Utah, there's a potential of  
13 3,800 to 4,500 megawatts of generation in that small  
14 area to be taken offline and that all needs to be  
15 replaced.

16 Q. Right. If you could quantify that in terms  
17 of, say, a number of plants equal to, say, Utah's  
18 Huntington or Hunter plants, how many facilities are we  
19 talking about just to replace that?

20 A. Well, let me just mention the growth load in  
21 the State of Utah and, then, I'll combine those two  
22 needs and compare that to a typical coal-fired  
23 generating station for the State of Utah.

24 Rocky Mountain Energy, as I mentioned before—  
25 actually, it's their parent, PacifiCorp, for all of the

1 states in which they provide service, seven states, the  
2 seven public service commissions in those states  
3 require Rocky Mountain to develop their load forecast,  
4 as well as a plan to meet that load. The last  
5 published IRP report was 2011. In that report, they  
6 are forecasting that, between now and 2020, they have  
7 no indication what the load growth is beyond 2020, but  
8 between now and 2020, they are forecasting, in the  
9 State of Utah, a growth load of 2.4 percent a year.

10 The governor of the State of Utah, in his energy  
11 policy published about two years ago, forecast for the  
12 entire state a growth load of between two and 2.4  
13 percent. Now, the municipalities and rural  
14 cooperatives provide about twenty-five percent of the  
15 power in the State. So, Rocky Mountain Energy is  
16 seventy-five percent of the load and they have, again,  
17 forecasted a load growth of 2.4 percent a year between  
18 now and, if that were to continue to 2025, the date  
19 I've been using, that would be 1,440 new megawatts of  
20 power.

21 So, to replace the closed plants to provide the  
22 new growth load energy forecasted by Rocky Mountain in  
23 the State of Utah, that total would be between, say,  
24 5,200 and 5,900 megawatts of power. That is the  
25 equivalent of about 13—let's see if my math's right—13

1 Hunter-sized plants, the size of a typical Rocky  
2 Mountain Energy plant in the State of Utah.

3 Q. That would be needed to fill that hole?

4 A. Needed to fill that hole. In addition to  
5 that, and because of the size of that, in that 2011  
6 IRP, Rocky Mountain—or, PacifiCorp has forecast a  
7 shortage of generation capacity of 3,800 megawatts. In  
8 other words, they feel that they just can't build power  
9 plants large enough and they're going to have to export  
10 from their region as much as 3,800 megawatts to meet  
11 the power demand that that single utility has.

12 Q. You mean import—

13 A. Import, right, import that.

14 Q. -into Utah.

15 A. Now, I also want to mention that the Governor  
16 of the State of Utah is aware that, for the last 20  
17 years, the State of Utah has been a substantial  
18 exporter of electricity and the two major power plants,  
19 the two major utilities between Intermountain Power  
20 Agency and Rocky Mountain Energy, from between 1986 and  
21 1996, were the two largest taxpayers in the State of  
22 Utah. They provided more revenue for public schools  
23 and government services than any other industry in the  
24 State of Utah and the State of Utah needs the revenue.

25 So, the governor adopted, in 2012, an energy



1 policy for the State of Utah and it contained what he  
2 called energy initiatives and one of those initiatives  
3 that he announced and challenged the municipal, the  
4 cooperative and the incumbent public utility to produce  
5 generation capacity within the State of Utah for  
6 economic development purposes and for export revenue  
7 purposes a twenty-five percent more energy capacity  
8 than the State of Utah needs.

9 Q. In order to export that?

10 A. In order to export that and that equals,  
11 roughly, 1,200 megawatts. So, you can see that the  
12 demand of energy, either desires or needed, in the  
13 State of Utah, and in the four corners region, is just  
14 absolutely huge.

15 Q. What role—

16 A. Utah is the third fastest growing state in the  
17 nation and there's no other region in the country that  
18 needs the amount of electricity that this region needs  
19 to meet its needs and its economic desires.

20 Q. Let me ask you about the role of natural gas.  
21 You're aware, of course, that natural gas prices are,  
22 currently, quite low?

23 A. Certainly.

24 Q. What do you anticipate in the way of natural  
25 gas development in the state to meet those energy

1 needs, as well as the emissions issues?

2 A. Well, the benefit of natural gas, of course,  
3 is that it's quite inexpensive at the present time,  
4 less expensive than, historically, it's ever been. The  
5 second issue is that natural gas plants can be  
6 relatively fast, within, maybe, a three or four year  
7 time frame; whereas, a coal project—unit 3 was an  
8 eleven year process and this nuclear process is longer  
9 than that. So, gas can be built relatively quickly.

10 The problem, again, is that it does emit  
11 substantial emissions that both impact health and  
12 impact visibility and, so, the Utah Public Service  
13 Commission, in hearings that I have attended, have  
14 encouraged the incumbent utility to attempt to slow  
15 down the rate at which they are constructing new,  
16 natural gas power plants and find alternative, cleaner  
17 resources.

18 That has not come by way of published orders.  
19 It's been oral suggestions during rate paying hearings  
20 and other hearings regarding the integrated resource  
21 plan of Rocky Mountain Energy.

22 Q. Let me ask you about those possible cleaner  
23 alternatives. What is Utah doing in connection with  
24 wind and solar energy?

25 A. Well, unfortunately, wind resources in Utah

1 are diminimus. We have one and one only major wind  
2 project in the State of Utah that is located near the  
3 City of Milford in southwestern Utah. That project  
4 marketed its energy in the State of Utah and could not  
5 find a single utility interested in acquiring those  
6 resources because of the cost. Cost was high because  
7 the wind resource studies that were done indicated that  
8 those windmills would only operate about twenty percent  
9 of the time, four hours a day, roughly. The rest of  
10 the time, 20 hours a day, any utility acquiring that  
11 wind resource would be required to have some other  
12 generation source to back it up and, eventually, they  
13 found interest in California.

14 The same six municipal utilities that participated  
15 in IPP desired that power. There was no way to get  
16 that electricity to Southern California. So, when I  
17 was general manager of IPA, we agreed to pay for an  
18 upgrade of our converter stations at both the IPP site  
19 and in Southern California at Adelanto, upgrade those.  
20 Our transmission line, which was DC, which IPA owns,  
21 into Southern California had the capacity, if we could  
22 convert the electricity from AC to DC, ship it down,  
23 re-convert it.

24 So, we upgraded that line so that the Californians  
25 could transmit the power from the wind project in

1 Milford down to Southern California. That energy is  
2 costing them three times what it cost for their coal-  
3 fired generation and IPP, nevertheless, for political  
4 and for environmental reasons, they entered into those  
5 contracts and those cities, then, built a gas turbine  
6 in the City of Burbank to run for, basically, 20 hours  
7 a day to replace the lost wind energy that only  
8 produces power four hours a day, which makes the  
9 essence of what I'm saying is that wind, in Utah, is a  
10 very poor resource which makes generation from wind  
11 extremely expensive and, by the way, that has been  
12 identified as the best resource in the State of Utah of  
13 any size.

14 There's a few sites that have been found where  
15 five or ten megawatts could be developed. So, there's  
16 a few very small wind farms. There's—I consulted with  
17 a company for a few years trying to build a very small  
18 resource. The community was very much opposed to  
19 having the windmills in their community and both of the  
20 projects I was working on failed because of lack of  
21 political support in the communities, public opposition  
22 having windmills in their back yards.

23 Q. What is base load power? What does that mean?

24 A. Base load power is power that, basically, is  
25 always available when you flip the switch. It's,

1 essentially, seven days a week; roughly, 24 hours a  
2 day, with very small, intermittent periods when the  
3 plant is not working.

4 Q. And what are the current sources of base load  
5 power in Utah?

6 A. Coal, natural gas and, in the future, nuclear,  
7 if it can be successfully deployed here. Coal, new  
8 coal, again, cannot be built. I don't think I  
9 mentioned, earlier, that when I was general manager, I  
10 entered into a contract with CH2MHill to evaluate about  
11 24 sites in the State of Utah to determine if an 80  
12 megawatt power plant could be built anywhere in the  
13 State of Utah because that was the smallest size being  
14 proposed by any of the utilities in the State and,  
15 after a substantial review of the air quality  
16 monitoring data, CH2MHill reported back to  
17 Intermountain Power that all of those sites failed the  
18 new requirements. Essentially, meaning that the State  
19 of Utah could not—nobody in the State of Utah could  
20 successfully submit an air quality application for a  
21 new air quality emissions permit from even a very small  
22 coal-fired generating station within the state.

23 Q. What is Utah doing, right now, in connection  
24 with solar power?

25 A. Solar energy is, again, a very expensive

1 resource, costing, roughly, three or four times the  
2 cost, say, of coal-fired generation from Intermountain  
3 Power. There are a number of very small solar  
4 installations, primarily on buildings. The State  
5 Legislature has passed legislation to provide both  
6 solar resources and wind resources with the same tax  
7 incentives that provided for nuclear, to provide a  
8 little playing field and, again, to try to stimulate  
9 the development of those resources.

10 The Legislature has also adopted, through its  
11 legislature and, also, the governor has included, in  
12 his energy policy, support for development of both wind  
13 and solar. There are no large solar installations in  
14 the State of Utah, but a number of building have built  
15 solar installations on their facilities, a couple of  
16 which are, now, generating more electricity than those  
17 facilities need and that energy is being bought through  
18 the grid by Rocky Mountain Energy.

19 Q. Now, are you aware of a recently proposed  
20 project, I think it's near Delta?

21 A. Yes.

22 Q. Tell me what you know about that solar  
23 project.

24 A. It's—I don't know the official term, but  
25 there's a large facility being proposed near Delta,

1 Utah, which would install mirrors and those mirrors  
2 would focus the sun on a central device that would  
3 generate steam and turn turbines. Again, they have  
4 been discussing, with various utilities, municipal, co-  
5 op, the incumbent utility in the State of Utah, selling  
6 that electricity or those utilities. None of them are  
7 interested because, again, of the price and the  
8 intermittency. That means that project is proposed to  
9 be able to generate electricity on the average about  
10 four and a half to five hours a day, during the summer  
11 months, and significantly less than that during the  
12 winter months. They're now in-

13 Q. What kind of capacity is that proposal,  
14 megawatt-wise?

15 A. I don't recall. I knew once, but I've  
16 forgotten now. They are, now, having discussions,  
17 again, with the municipal utilities in Southern  
18 California. A couple of those utilities have expressed  
19 interest, they've told me, in that project. Nobody has  
20 signed contracts. The project is in its early planning  
21 stage. So, it may or may not be constructed.

22 Q. Tell me why you joined Blue Castle.

23 A. I joined Blue Castle, primarily, because I was  
24 interested in the development side. Again, I spent my  
25 career helping to develop Intermountain Power, seven

1 years planning the new coal-fired generating station,  
2 and I determined, based upon the research that we  
3 obtained from CH2MHill, that no new coal-fired  
4 generating station could be built in the State of Utah  
5 and, so, the development opportunities at Intermountain  
6 Power were foreclosed. I came to a conclusion that  
7 nuclear energy was the only base load resource that  
8 could be built emissions free and IPP and all of the  
9 plant closures and the failures of all of these  
10 generating stations were caused, primarily, because of  
11 the emissions issue.

12 So, I wanted to see the deployment of nuclear  
13 occur in the State of Utah. I wanted to be part of  
14 that. I retired from that job to participate in an  
15 entity attempting to deploy nuclear in the State of  
16 Utah and I was confident enough that that could be  
17 accomplished in the near future in Utah, that I left a  
18 very nice career to start a new one.

19 Q. And Blue Castle's project, then, is to get  
20 this to the license stage and, then, see whether the  
21 plant can be built?

22 A. Yes and, again, the State of Utah has a  
23 history of having numerous utilities get together to  
24 own and operate power plants and that's exactly the  
25 model that would be required for the deployment of



1 nuclear energy in Utah. So, I felt Utah was both a—  
2 would be a very favorable environment, both technically  
3 among the utilities, as well as politically among the  
4 political leaders in the state, to allow nuclear energy  
5 to be deployed in this state.

6 MR. WRIGHT: No further questions, Your Honor.

7 THE COURT: Cross-examination, Ms. Swensen?

8 MS. SWENSEN: Yes. I apologize for the moment,  
9 getting my [inaudible]

10 THE COURT: Take your time. We're in no rush.

11 CROSS-EXAMINATION

12 BY MS. SWENSEN:

13 Q. Good morning, Mr. Searle.

14 A. Good morning.

15 Q. You described for us your extensive  
16 background, essentially, dealing with energy. Is that  
17 correct?

18 A. Have I done that?

19 Q. You described that for us today?

20 A. I did, yes.

21 Q. I apologize. Is that better?

22 A. That's right, yes. Thank you.

23 Q. Please let me know if you can't hear my  
24 questions.

25 A. Okay.

1 Q. Do you have any experience, previously, with  
2 applying for nuclear permits?

3 A. No.

4 Q. Do you have any experience, previously, in  
5 managing or operating a nuclear plant?

6 A. No.

7 Q. You are a salaried employee of Blue Castle,  
8 correct?

9 A. That is correct.

10 Q. And you hold stock in the company as well?

11 A. That is correct.

12 Q. What percentage of the company stock do you  
13 own?

14 A. Oh, I don't know what percentage it entails.

15 Q. And you've been involved with them since,  
16 approximately, what year, with Blue Castle?

17 A. 2008.

18 Q. 2008?

19 A. Yes.

20 Q. You discussed, as part of your job and role  
21 with Blue Castle, that you've had contacts with  
22 PacifiCorp, correct?

23 A. That's correct.

24 Q. And that you meet with them, roughly, every  
25 six months and that you've worked with them in

1 developing their IRP's. Is that accurate?

2 A. I wouldn't say work with them in developing  
3 their IRP's. We have been a public participant in that  
4 process, along with dozens of other organizations and  
5 individuals.

6 Q. Thank you for that clarification, but you are  
7 familiar, from your past and current role, with IRP's  
8 as a document, correct?

9 A. Modestly so.

10 Q. You reference, in your testimony today and in  
11 your previous report, the 2011 IRP of PacifiCorp  
12 several times, correct?

13 A. That's correct.

14 Q. And you consider that to be a reasonable  
15 indication of their forecasted needs and plans to meet  
16 those needs, correct?

17 A. I do. I rely upon that as Rocky Mountain  
18 having experts in that area, especially when the Public  
19 Service Commission of Utah approves the document and I  
20 believe that that verifies the IRP accuracy.

21 Q. Okay. Have you reviewed the 2013 PacifiCorp  
22 IRP?

23 A. Have I reviewed it?

24 Q. Yeah.

25 A. I attended meetings where there were public

1 discussions occurring about the IRP, but since it has  
2 not--the new IRP has not been published, I have not  
3 read it or reviewed it or attended any of the Public  
4 Service Commission hearings with respect to that. I'm  
5 not certain that they've even had their--I don't believe  
6 they've had their Public Service Commission meetings  
7 about their 2013 IRP.

8 Q. So, when you say not published, you don't mean  
9 it's not publicly available, do you?

10 A. Well, drafts of it are, but the IRP has not  
11 been published. It's not been finalized. It's not  
12 been approved by the Public Service Commission as far  
13 as I know.

14 Q. I'm going to hand you--

15 [Inaudible discussion.]

16 THE COURT: Just like we would, normally. So,  
17 this would be Exhibit--what was the last exhibit you  
18 had, Mr. Wright?

19 MR. WRIGHT: I believe it is 67.

20 THE COURT: This will be Exhibit 68.

21 MS. SWENSEN: I didn't know if you wanted to  
22 [inaudible] That's fine.

23 MR. WRIGHT: Yeah, 68 is next.

24 THE COURT: Thank you.

25 [Inaudible discussion.]

1 Q. I'm handing you what's been marked, I believe,  
2 as Exhibit 68. Could you turn to the first page—or, I  
3 should say the page that is numbered 1, not Roman  
4 Numeral, but Chapter 1, Executive Summary.

5 A. Okay.

6 Q. Do you see the graphs at the bottom of the  
7 page comparing the load forecast from the 2011 IRP to  
8 the 2013 IRP?

9 A. On page one?

10 Q. Correct. It's titled Figure ES.1, not Roman  
11 Numeral one.

12 A. Oh, not Roman Numeral I, page—

13 Q. Arabic Numeral.

14 A. Yes.

15 Q. All right. The 2013 forecast shows a decrease  
16 in the projected load, correct, as compared to the 2011  
17 forecast?

18 A. That is correct.

19 Q. And it's, in fact, even a decrease from what  
20 they call the 2011 IRP update, isn't it?

21 A. That is correct.

22 Q. And do you see, in the bulleted paragraph  
23 immediately above that, it states that the lower load  
24 forecast is driven, significantly, by the industrial  
25 self-generation taking advantage of low natural gas

1 prices, as well as by load request cancellations in  
2 Utah and Wyoming. Do you see that?

3 A. Yes.

4 Q. So, a load request cancellation would mean  
5 less demand for power in Utah at the current time,  
6 correct?

7 A. Ask that one more time. I couldn't quite  
8 hear.

9 Q. A load request cancellation indicates less  
10 demand for power in Utah at the current time, correct?

11 A. It could mean that. It could mean a lot of  
12 things. It could mean financial planning. It could  
13 mean cost issues. It could mean that they've  
14 identified other resources from out of the region. It  
15 could mean a lot of things.

16 Q. Okay, let's break that down.

17 A. Okay.

18 Q. It means that less power is—well, first, let's  
19 just simplify. It means that less power is being  
20 requested from PacifiCorp to serve Utah, correct?

21 A. Less new generation.

22 Q. Less load, right? Isn't that the generation  
23 power that will be supplied to Utah? You explained  
24 what a load meant.

25 A. Load is the consumption. We're talking about

1 capacity construction.

2 Q. Right. So, if there is a decreased forecasted  
3 annual system load, that is less consumption in Utah,  
4 correct?

5 A. Yes. I would agree with that.

6 Q. And that could be explained, as you said, by  
7 multiple reasons, but the bottom line is it's less  
8 consumption in Utah being forecast.

9 A. Okay.

10 Q. Are you aware of the revised growth forecast  
11 in the 2013 for Utah?

12 A. I've seen it, yes.

13 Q. But that didn't affect your analysis in any  
14 way?

15 A. Well, it certainly will when it's approved by  
16 the Public Service Commission.

17 Q. So, if, in fact, the Public Service Commission  
18 approves the revised growth forecast of only 1.79  
19 percent, that will affect your conclusions?

20 A. Yes.

21 Q. How would it affect them?

22 A. It means that, rather than, perhaps, the  
23 needed 5,200 to 5,900 megawatts, it would be reduced  
24 slightly by as much as, perhaps, a thousand megawatts.

25 Q. You referred to the 2011 PacifiCorp IRP as

1 being the one that you were relying on.

2 A. That's correct.

3 Q. What was the first date that the 2011 IRP  
4 found nuclear could be a viable option?

5 A. I believe—I don't recall if it was the 2011  
6 IRP or the earlier IRP, but I believe it was in the  
7 year 2025 [inaudible]

8 Q. I can refresh your recollection, because  
9 you're correct that, in your report, you cited the 2008  
10 and the 2011 IRP and I don't want to confuse between  
11 those two.

12 A. Okay.

13 Q. So, in 2008, you would agree that the IRP  
14 found nuclear could be viable as of 2025. Is that  
15 consistent with your recollection?

16 A. That's my recollection.

17 Q. And, in 2011, do you recall whether they used  
18 the same date for nuclear first being viable?

19 A. I don't recall.

20 Q. Uh-huh [affirmative]. And if it were the case  
21 that they pushed it out to 2030, do you know why that  
22 would be?

23 A. Because there would be, probably, two reasons:  
24 either the load demand did not require it, or that  
25 they simply had options that they preferred, at the



1 present time, for constructing new generation.

2 Q. You've given us a lot of indications of  
3 possible indicators of demand for power today, correct?

4 A. Ask that again.

5 Q. You've given a lot of indicators of possible  
6 demand for future power, correct?

7 A. Some indicators, yes.

8 Q. Some indicators.

9 A. Yes.

10 Q. Would you agree with the statement in your  
11 report that nothing demonstrates the need for power  
12 generation resources as strongly as contract offers?

13 A. I agree that that—I feel that that is  
14 accurate.

15 Q. Can you explain what you mean by a contract  
16 offer?

17 A. Well, when I was responsible for marketing the  
18 output from the proposed 900 megawatt coal-fired power  
19 plant, we had approvals of either the Public Service  
20 Commission or the boards of the rural electric  
21 cooperatives or the municipal utility city councils for  
22 1,200 megawatts of new generation capacity. Those  
23 approvals were granted, executed by those parties and  
24 provided to IPA to counter-execute.

25 In most cases, the Public Service Commission had

1 to approve those contracts. That, in and of itself,  
2 indicated to me that there were 1,200 megawatts of  
3 demand that was sufficiently strong. It would cause  
4 entities to enter into contractual processes to acquire  
5 those resources.

6 Q. And when you were discussing solar and wind as  
7 potential alternatives in your testimony today, I think  
8 that, consistent with what you just said, that you  
9 indicated that the lack of contract offers, the lack of  
10 interest from utilities, setting aside exporting to  
11 Southern California for the moment, was an indication  
12 that that particular source was not economically viable  
13 or otherwise attractive. Is that correct?

14 A. Yes, but I do not have any idea exactly why  
15 the utilities in Utah did not execute contracts for  
16 those resources. I assume it had to do with the price,  
17 which I was aware of, or because of the intermittency  
18 of that resource.

19 Q. How many contract offers has Blue Castle  
20 received for the proposed project?

21 A. I don't know. That would be a question you  
22 would have to ask Aaron Tilton.

23 Q. You're not involved in the marketing of the  
24 power expected to be generated from this project?

25 A. Not in the contract negotiations, no.

1 Q. Are you aware that there are contract  
2 negotiations?

3 A. Yes.

4 Q. Are you aware if any of them have resulted in  
5 a contract?

6 A. I'm aware of none of the details of those  
7 contract negotiations.

8 Q. That's not what I asked. Not the details, but  
9 are you aware of the existence or if any of them have  
10 resulted in a contract, regardless of the terms?

11 A. Yes, I am.

12 Q. How many?

13 A. I don't know the number, but I know that there  
14 are some executed memorandums of understanding or  
15 contracts or—again, that's not my area of expertise.  
16 So, I can't answer that question.

17 Q. Okay. So, your understanding of the business  
18 plan of Blue Castle, then, would involve signing on  
19 utilities before the ESP is signed?

20 A. I'm not a member of the board, but that's—

21 Q. Of Blue Castle?

22 A. -at Blue Castle, but that is not our business  
23 model. As Aaron Tilton testified before, we believe  
24 that the value of the option that we are offering has  
25 greater value, later, perhaps even after we've obtained

1 the ESP, then, prior to that.

2 Q. So, you're not—so to be clear, based on just  
3 your knowledge and your role, you're not using any  
4 indicia of interest in purchasing power from Blue  
5 Castle to support y our opinion that there is  
6 sufficient demand, correct?

7 A. Ask that one more time.

8 Q. You've concluded that there is sufficient  
9 demand for the power to be generated from the Blue  
10 Castle project, correct?

11 A. That is my opinion.

12 Q. As part of the support from that opinion, you  
13 are not, however, relying on any contract offers that  
14 have been made for that power?

15 A. That is my understanding, yes.

16 Q. That you are not relying on those? Because  
17 that's not your area?

18 A. That is correct.

19 Q. Okay. Let's talk about you had given us  
20 several examples of power plants, coal power plants  
21 that either were planned and are being closed or were  
22 never able to get the permits, correct?

23 A. Correct.

24 Q. The IPP unit 3—or, maybe, it's not the unit 3.  
25 Scratch that. Consistent with your testimony today,

1 you stated, in your report, that power suppliers in  
2 Utah, including Rocky Mountain Power, or Rocky Mountain  
3 Energy, as you've described them today—I assume that's  
4 the same entity, correct? Rocky Mountain Power and  
5 Rocky Mountain Energy?

6 A. Yes.

7 Q. A subsidiary of PacifiCorp?

8 A. PacifiCorp is the parent of Rocky Mountain  
9 Energy.

10 Q. Just making sure I wasn't mixing up names.

11 A. Correct.

12 Q. Deseret Power and UAMPS were examples of—I  
13 mean U-A-M-P-S.

14 A. Right.

15 Q. My understanding is the collective of,  
16 basically, municipal power—municipalities interested in  
17 power.

18 A. That is accurate.

19 Q. Those were—did all of them reach the  
20 conclusion that future energy needs have to be met by  
21 non-coal resources, including nuclear, correct?

22 A. All of those utilities, again, 42  
23 municipalities, Rocky Mountain Energy, were all  
24 contract participants in unit 3. They were all  
25 notified of the cancellation of that project due to air

1 quality concerns, visibility concerns, the new  
2 regulations to prevent haze and protect visibility.  
3 They were all aware that that was the reason the plant  
4 was terminated and they were all aware of the studies  
5 that were done by CH2MHill to evaluate the feasibility  
6 of anybody obtaining a new air quality permit for coal-  
7 fired generation from basically any perceived site in  
8 the State of Utah.

9 Q. Uh-huh [affirmative] and you claim that UAMPS  
10 hasn't been able to plan or construct—I think your  
11 words were successfully—I'm not going to get your exact  
12 words, but another generation project since IPP unit 3  
13 failed, correct?

14 A. A base load resource. They had entered into  
15 contracts to acquire some wind energy. When I say  
16 they, I'm talking about some of the members have  
17 entered into contracts to require, primarily,  
18 additional wind energy and some of them have entered  
19 into contracts to obtain wholesale power from Rocky  
20 Mountain Energy, but they have been involved in  
21 planning new generation resources and those plans have  
22 not gelled and not been successful.

23 Q. And you claim that UAMPS, in particular, is  
24 wary of new natural gas because of the utility's past  
25 experience with the volatility of the fuel price,

1 correct?

2 A. No. I did not say that.

3 Q. Do you recall, in your report, you stated:  
4 also, UMPA is wary of new natural gas fired resources  
5 because of the negative financial experience of other  
6 utilities, 1991 to 2001, from fuel pricing volatility.  
7 Do you recall that?

8 A. Well, I thought your question was my testimony  
9 today. I do recall that. In the year 2000, several  
10 participants in UAMPS, several of its members had  
11 entered contracts to buy energy from natural gas-fired  
12 generation. In the year 2000, the price of natural gas  
13 skyrocketed. Those utilities at UAMPS, who had these  
14 contracts, had their cost of wholesale power quadruple  
15 within a matter of months. They were on the verge, at  
16 that time, of bankruptcy when, finally, Zions Bank  
17 agreed to an emergency loan for those utilities.

18 The utilities agreed to a surcharge on their  
19 retail rates to all of their customers for a period of  
20 ten years to pay back that loan in order to avoid  
21 bankruptcy. That caused several of those  
22 municipalities to be rather tepid in their interest for  
23 new contracts associated with gas-fired generating  
24 stations. I think the stability, in the last few  
25 years, of natural gas may have tempered that somewhat,

1 but a number of those municipalities recall that  
2 situation.

3 At the same time, that spike in natural gas prices  
4 was responsible for the bankruptcy of both major  
5 utilities in California and both major utilities in  
6 Nevada.

7 Q. So, it is still your position, today, that  
8 UAMPS would be wary of any new gas generation projects?

9 A. I think that is true with respect to some of  
10 its members. Some of the UAMPS members were not  
11 members of UAMPS at that time and, so, did not have the  
12 same experience that other members had.

13 [Inaudible discussion.]

14 MR. WRIGHT: Sixty-nine.

15 MS. SWENSEN: Sixty-nine. Thank you, counsel.

16 [Inaudible discussion.]

17 Q. I'm handing you what's been marked as Exhibit  
18 69. Let's turn to page 10 again, Arabic Number 10. I  
19 don't recall if there's a Roman Numeral at the  
20 beginning.

21 MR. WRIGHT: Your Honor, objection. Before we  
22 start talking about the document, we ought to identify  
23 it.

24 MS. SWENSEN: Sure.

25 THE COURT: I think that's right.



1 Q. Mr. Searle, I'm handing you—or, I've handed  
2 you what's been marked as Exhibit 69. Have you—it's  
3 the UAMPS 2012 IRP. You've seen this document before?

4 A. I have, yes.

5 Q. You have. Can you turn to page 10, the very  
6 top of the page? You see the sentence that reads as a  
7 significant source of clean and reliable power, UAMPS  
8 will continue to investigate the use of natural gas-  
9 fired power as a potential resource to meet its future  
10 needs. Do you see that?

11 A. Yes, I do.

12 Q. Does that alter your opinion, at all, that  
13 they would be unlikely to select new gas-generated—

14 A. What I can say with respect to that paragraph  
15 is, in personal discussions with some of the utility  
16 managers, there is a sense, among some of the members  
17 of UAMPS, that their only option available in the State  
18 of Utah for base load generation, currently, is the  
19 development of new natural gas. They understand that  
20 new coal cannot be built. They've investigated hydro.  
21 They believe that new hydro licenses are not  
22 obtainable and that, until there is an option for  
23 nuclear available to them, natural gas remains,  
24 basically, the only base load option. So, they have no  
25 other alternative.

1 Q. Please turn to page 17. It's paragraph  
2 7.1.2.3, titled Additional Gas-Fired Power.

3 A. Okay.

4 Q. You see where it reads natural gas generation  
5 is an excellent option for meeting intermediate and  
6 peak load growth, providing the capacity that is  
7 necessary to meet potential reliability standards.  
8 Natural gas generation can be built in numerous size  
9 and configurations based on the organizational needs.  
10 Higher fixed costs are often mitigated by lower  
11 variable costs and the operational flexibility of the  
12 plants. Relatively low forecasted gas prices due to  
13 exploration in drilling technologies and the  
14 availability of long-term, low cost fuel supply made  
15 gas-fired generation an attractive resource.

16 Is that consistent with what you just indicated;  
17 that they feel that gas is, in fact, perhaps their only  
18 viable option for those reasons?

19 A. I believe it's not inconsistent with what's  
20 stated in the document.

21 Q. And, on the following page, paragraph 7.2.1,  
22 there's—

23 A. That would be page—

24 Q. Eighteen.

25 A. Eighteen?

1 Q. I apologize. I had shut it and I should not  
2 have.

3 A. Okay. I found page 18.

4 Q. Okay. At the top, 7.2.1, recommendation one,  
5 demand side programs. Based on your experience in the  
6 energy industry, are you familiar with the concept of  
7 demand side management? I've often seen it referred to  
8 as DSM.

9 A. I am.

10 Q. And is that an option for addressing the  
11 anticipated needs of Utah going forward?

12 A. It is an option.

13 Q. And you see, under recommendation 2,  
14 additional resources. This is the discussion of  
15 additional resources, in addition to reducing demand  
16 through conservation, essentially, these would be  
17 additional resources UAMPS is considering acquiring,  
18 correct?

19 A. I would agree with that.

20 Q. Do you see the second paragraph, the second  
21 sentence says UAMPS will also continue to pursue the  
22 development of additional wind generation to the extent  
23 it meets selection criteria? Is that consistent with  
24 your understanding of their attitude towards wind  
25 generation?

1           A. UAMPS has entered into discussions with  
2 several wind development organizations in the State of  
3 Wyoming and in the State of—in one case, in the State  
4 of Idaho.

5           Q. Are you familiar with the Horse Butte Wind  
6 Project?

7           A. With what?

8           Q. Horse Butte Wind Project?

9           A. No.

10          Q. Are you aware of UAMPS developing the Horse  
11 Butte Wind Project in 2012?

12          A. No.

13          Q. Please turn back to page 10, paragraph 4.6.  
14 You see the paragraph that begins as a result of the  
15 last IRP process, UAMPS has investigated and acquired a  
16 second wind resource through a PPA with the Horse Butte  
17 Wind Project. UAMPS solely developed a project wind  
18 generation facility. Do you see that?

19          A. No. That's 4.6?

20          Q. Correct. The first two sentences were what I  
21 just read. UAMPS has investigated and acquired a  
22 second wind resource. UAMPS solely developed the  
23 project wind generation facilities.

24          A. Yes. I see that.

25          Q. Were you unaware of that?

1           A. Well, I was aware that they had entered—a few  
2 of the UAMPS cities had entered into contracts for  
3 additional wind resources, yes. I was aware of that.

4           Q. Uh-huh [affirmative]. Do you see the third  
5 paragraph under 4.6 says wind has an important role in  
6 power generation and UAMPS is working to integrate wind  
7 resources with operation and [inaudible] attributes  
8 that compliment UAMPS' resource mix? You wouldn't  
9 disagree with that, right?

10          A. I would not.

11          Q. You also pointed out, in your report and—well,  
12 you identified, earlier in your testimony today,  
13 Deseret Power as another of the utilities in Utah--

14          A. Yes.

15          Q. —correct? And I believe you testified, to me,  
16 that they were one that were reaching the conclusion  
17 that future energy needs needed to be met by non-coal  
18 resources. Is that accurate?

19          A. That's accurate. Again, they attempted to  
20 construct an 80 megawatt—

21          Q. That would be Bonanza, correct?

22          A. That was the Bonanza project, yes.

23          Q. I understand. Does Deseret Power need a new  
24 generation project? Have you reviewed their 2012 IRP?

25          A. Well, the question is a little bit ambiguous.

1 It's whether they need it or whether they want it.

2 Q. Well, let me ask it more specifically. Did  
3 they forecast inadequate resources for their expected  
4 load?

5 A. No, because they have been exporting some of  
6 the energy to other utilities from their Bonanza plant.  
7 Some of those contracts are expiring and they're being  
8 able to pull back into the State of Utah some of that  
9 energy, but they did have the need for—or, at least the  
10 ability to handle 80 megawatts of new resources.  
11 Otherwise, they would not have been proposing the 80  
12 megawatt power plant at Bonanza.

13 Q. And remind me the year on Bonanza. Is it  
14 2007?

15 A. That would have—the proposal was to bring it  
16 online in 2013.

17 Q. No. When was the proposal made is my  
18 question?

19 A. I believe their quality permit was, probably,  
20 requested in—I'm just not positive of the year. It was  
21 terminated, I believe, in 2007. They lost their  
22 lawsuit, I believe, in 2007.

23 Q. Okay, 2007 was when it was determined that  
24 Bonanza was not going forward, correct?

25 A. Yes. I believe that's the date.

1 Q. I was just looking for approximate year on  
2 that but, so, since your position is that, in 2007,  
3 clearly, they anticipated that they needed the  
4 additional generation from the proposed Bonanza?

5 A. Correct.

6 Q. But, in 2012, you agree that they do not show  
7 any shortage in resources for their expected load,  
8 correct?

9 A. Well, I'm not an expert on that issue. The  
10 truth is I haven't followed the rural electric  
11 cooperatives since the demise of that project. So, I  
12 can't answer that question.

13 Q. I'm handing you what's been marked as Exhibit  
14 70.

15 A. Okay, thank you.

16 Q. It's titled the Deseret Power Electric  
17 Cooperative Integrated Resource plan update, dated  
18 October 2012. Do you see that?

19 A. Yes.

20 Q. Have you seen this document before?

21 A. I have seen it before, yes.

22 Q. Please turn to page 7—oops, which I believe is  
23 actually—

24 A. One seven?

25 Q. Yeah. Hang on just a second. Actually,

1 starting on 1-6. It's a little odd, their numbering,  
2 but the very last sentence on the page reads Deseret  
3 and the members do not foresee the need for any new or  
4 additional capacity over the IRP update planning  
5 horizon. The study period is through the year 2018 or  
6 approximately seven years. Do you see that?

7 A. Which page is that on?

8 Q. The very bottom of I-I keep saying I-1 dash 6.

9 A. Yes, I see that.

10 Q. Do you have any reason to disagree with that  
11 statement?

12 A. No. As I mentioned before, what they have  
13 communicated to us, orally, is that they are not  
14 extending some of the contracts that they had in place  
15 with respect to the Bonanza power plant because they  
16 need those resources themselves.

17 Q. But they're not showing a shortage going  
18 forward.

19 A. That's correct, for the reason that I just  
20 mentioned.

21 Q. Okay. You had some discussion of the  
22 political support in Utah. That's part of your role is  
23 political legislative support for this type of project,  
24 correct?

25 A. Yes.



1 Q. And I know you mentioned the governor's energy  
2 initiative at one point, correct?

3 A. Yes.

4 Q. And the challenge there is for utilities to  
5 produce more energy than Utah needs, correct?

6 A. Yes.

7 Q. For the purpose of exporting it for sale?

8 A. That is what I understand the governor's  
9 energy initiative entails.

10 Q. Okay. You also mentioned, in terms of  
11 legislative support, in your report, you cited a  
12 specific statute, Code 63M4-301. Do you recall that  
13 statute?

14 A. I don't recall the specific title of that  
15 statute.

16 Q. I'm handing you what's been marked as Exhibit-  
17 oh, gosh, 71.

18 A. Okay.

19 Q. For convenience sake, this is simply a print-  
20 out of the statute cited, 63M4-301. It's titled, I  
21 believe, State Energy Policy. Does that refresh your  
22 recollection as to the statute?

23 A. Yes.

24 Q. And this is what you were referring to?

25 A. It is.

1 Q. And you believe that this indicates support  
2 for development of nuclear energy in Utah, correct?

3 A. That is correct.

4 Q. So, I look at subsection 1B. It says Utah  
5 will promote the development of, colon-and, then, it  
6 has subpart little (i) and little (ii) for non-  
7 renewable energy resources. Is nuclear listed in  
8 either of those categories?

9 A. C, Utah will promote the study of nuclear  
10 power generation.

11 Q. That was not my question. Is nuclear power  
12 generation listed as something Utah will promote the  
13 development of?

14 A. It's not included in (i)-or, it's not listed,  
15 specifically, in (i) or (ii).

16 Q. It's listed, instead, as you pointed out in  
17 (c), for promoting the study of nuclear power  
18 generation, correct?

19 A. That is correct.

20 Q. Why was it not included as something we would  
21 want to promote the development of?

22 MR. WRIGHT: Objection, foundation.

23 THE COURT: It's a rhetorical question because he  
24 didn't write the statute.

25 MS. SWENSEN: That's true. Let me back up.

1 Q. You testified that you've been involved in  
2 attempting to secure political and legislative support  
3 for the project, correct?

4 A. That is correct.

5 Q. Were you involved, in any way, in the drafting  
6 or discussion of this bill?

7 A. I was not engaged in the drafting of this  
8 bill, no.

9 Q. Were you engaged in the discussion of it?

10 A. Yes.

11 Q. Do you recall any discussion of including  
12 nuclear power generation as something that would be  
13 promoting the development of?

14 A. I don't recall a specific rationale for why  
15 the statute was drafted precisely in this format, no.

16 Q. Would you have preferred to have it listed as  
17 something to promote the development of?

18 A. I'm totally satisfied with the way that this  
19 is written.

20 Q. Just to promote the study of it?

21 A. Oh, yes.

22 Q. Okay. Just so we're clear, this doesn't  
23 allocate—it doesn't have any impact on the economic  
24 viability of the project, correct?

25 A. That's correct.

1 Q. There are no funds being allocated from the  
2 State, in terms of subsidies or otherwise, under this  
3 legislation?

4 A. Under this legislation, no. This is strictly  
5 a policy statement.

6 Q. The policy statement of general support for  
7 the study.

8 A. That is correct.

9 Q. Okay. Are you familiar with the term advance  
10 cost recovery?

11 A. Yes.

12 Q. You're aware that, in other states, there has  
13 been legislation passed to allow nuclear operators to  
14 recover some of their costs in advance of operation,  
15 correct?

16 A. I am not familiar with what other states have  
17 done.

18 Q. What is your familiarity with advance cost  
19 recovery?

20 A. Just I understand the term, the definition of  
21 it, how it works. That's about the extent of it.

22 Q. Okay. Is there any form of advance cost  
23 recovery in place in Utah?

24 A. I'm not an expert on that, but I believe not,  
25 but I couldn't answer that question accurately.

1 Q. That's fair, but it's not part of what you  
2 consider the political support or legislative support  
3 for the project?

4 A. That is correct. I can tell you that we  
5 considered whether that was necessary in Utah. We have  
6 discussed with the utilities. We have not, nor have  
7 those utilities, pursued attempting to have that  
8 accomplished in the State of Utah. We've not found any  
9 utility that was interested in that kind of  
10 legislation, that kind of statute.

11 Q. I may be able to short-circuit some questions  
12 here. Just to clarify, are you here to testify today,  
13 at all, as to the cost effectiveness of nuclear energy  
14 as compared to other forms?

15 A. No.

16 Q. Your discussion of wind and solar was purely  
17 from the perspective of what local utilities have  
18 engaged in as alternatives to coal, correct?

19 A. I don't know if I would characterize it that  
20 way. I was asked to respond to my testimony. I'm not  
21 an expert and I gave, I would consider, very limited  
22 information just simply based on very limited  
23 experience with those resources.

24 Q. Okay. So, you're not here to testify about  
25 comparison of, for example, production costs?

1 A. I am not.

2 Q. Okay or the construction costs associated with  
3 different types of power? That's not your field of  
4 expertise today?

5 A. That's not my field of expertise.

6 Q. Okay. That helps. Let's turn back to the  
7 2013 IRP for a moment.

8 A. The PacifiCorp 2013 IRP?

9 Q. PacifiCorp, pardon me.

10 A. Okay.

11 Q. Is it, in your experience, is it standard for  
12 the IRP's—let's say, specifically, to PacifiCorp—to  
13 include a preferred portfolio of options?

14 A. Again, I'm not an expert on the IRP process.

15 Q. Sure, but you testified that you're familiar  
16 with it. Have you seen that in IRP's before?

17 A. Yes, I have.

18 Q. Okay. Do you—let's turn to page 9, Arabic  
19 Number 9.

20 A. Okay.

21 Q. I apologize. Turn to page 11. I'm not sure  
22 why—that should have the title at the top, the 2013 IRP  
23 Preferred Portfolio. Are we on the same page?

24 A. Yes, ES.3?

25 Q. Exactly.

1 A. I'm not sure I can read this.

2 Q. The table? Well-

3 THE COURT: [inaudible]

4 Q. Is nuclear included in the preferred portfolio  
5 in the 2013 IRP?

6 A. It is not listed on this chart that I can  
7 find.

8 Q. And, to your knowledge, this is the optimal-  
9 let me back up. If you turn back to page 8, table  
10 ES.2. It's titled 2013 IRP Resource Options, correct?

11 A. Yes.

12 Q. Do you see, under other thermal, nuclear  
13 fission is listed, correct?

14 A. Yes.

15 Q. But it's not included in the preferred  
16 portfolio, right?

17 A. I believe that is accurate.

18 Q. Do you know why that is?

19 A. No.

20 Q. Please turn to page 139, one, three, nine.

21 A. I found that page.

22 Q. Do you see where it says-it contains the sole  
23 reference, in this report, to Blue Castle. It is  
24 assumed the [inaudible] would be installed at the  
25 proposed Blue Castle site near Green River. Do you see

1 the following sentence says nuclear fuel cost is  
2 assumed at 27.70 per kilogram in 2011 dollars, but is  
3 not considered a viable option in the PacifiCorp  
4 service territory before 2030 due to total capital cost  
5 uncertainty, including EPC and owners' cost, socio-  
6 political resistance and regulatory obstacles? Do you  
7 see that?

8 A. I see that.

9 Q. Is it your position that PacifiCorp is—that  
10 that would—is it your position that Blue Castle can  
11 overcome the obstacles that a major utility, like  
12 PacifiCorp, cites as excluding it as a viable option?

13 A. Ask the question again.

14 Q. I would love to. That was terrible. Is it  
15 your position that Blue Castle can overcome the  
16 obstacles cited by a major utility, like PacifiCorp,  
17 for excluding nuclear as a viable option?

18 A. Well, I think when Mr. Graber testifies, he  
19 will testify about the importance of the business plan  
20 that we have, providing an option to utilities. One  
21 thing you'll see from these IRP's is that the position  
22 of a utility changes dramatically from one year IRP to  
23 the next year IRP.

24 Q. Certainly.

25 A. In 2027, Rocky Mountain Energy—I'm sorry, in



1 2007, Rocky Mountain Energy was prepared to spend half  
2 a billion dollars—well, a billion dollars for their  
3 share of a new coal plant. Literally six weeks later,  
4 those plans had totally changed from one IRP to the  
5 next IRP. You look back in their 2007 IRP, there was  
6 no mention of utility. By 2008, 2011, it was a  
7 preferred alternative. Here, they've changed their  
8 position.

9 The optionality of having a licensed site provides  
10 a utility with the ability to respond rapidly.  
11 Otherwise, if they choose a preference of nuclear, it  
12 would be 15 years before they could exercise that. I  
13 mean, a plant's license shortens the planning  
14 opportunity for them by seven to ten years. That's the  
15 attractiveness of the Blue Castle proposal for these  
16 utilities. When they change their minds, they're  
17 prepared. They can respond without having that option  
18 foreclosed to them simply because of the time  
19 constraints in developing these resources.

20 So, the only thing I can see, from this, is that  
21 the utility's planning process changed dramatically  
22 from year-to-year and neither you, nor I, nor anybody  
23 else at Blue Castle can predict what will be desired by  
24 that utility in the near future, let alone in the 10,  
25 15 year distant future.

1 Q. But you've stated that you rely on the  
2 professional financial skills that PacifiCorp has or  
3 contracted for to make these IRP's, correct?

4 A. That's correct.

5 Q. And you have relied on them as being a  
6 reliable source of forecasts for demand and resource  
7 needs going forward, correct?

8 A. In most cases, they're as accurate as we're  
9 going to find information.

10 Q. And you agree that they don't forecast just  
11 for the short-term. Their forecast goes as far as, in  
12 the most recent, 2032, correct?

13 A. That's what it appears but, again, I'm not an  
14 expert in that area. I couldn't [inaudible] opine.

15 Q. So, your testimony that you just gave was that  
16 they change a lot, but it's nice to have the option in  
17 the long-term, essentially, correct?

18 A. [inaudible]

19 Q. Please turn back to page 11. It's the page  
20 that has the heading of the 2013 IRP preferred  
21 portfolio.

22 A. Yes.

23 Q. Do you see the last sentence in the second  
24 paragraph states over the long term, the 2013 IRP  
25 preferred portfolio includes additional wind resources

1 totaling 650 megawatts in the 2024 to 2025 time frame  
2 which contribute to meeting long-term, state and  
3 assumed RPS obligations, correct?

4 A. Right. I read that, yes.

5 Q. Do you see it does appear that they are  
6 considering long-term options as well as the near term,  
7 correct?

8 A. This IRP has forecast information out to 2032.

9 Q. Including the resource units that they, by  
10 type, that they anticipate using through that year,  
11 correct?

12 A. That's correct.

13 Q. And it does not include nuclear.

14 A. Not on this page, it does not include nuclear.

15 Q. Thank you.

16 MS. SWENSEN: That's all I have.

17 [Inaudible discussion.]

18 THE COURT: Mr. Wright? Excuse me, Ms. Valdes,  
19 any questions?

20 MS. VALDES: No questions. Thank you.

21 THE COURT: Thank you. Mr. Wright, any re-direct?

22 MR. WRIGHT: Yes, a few questions, Your Honor.

23 THE COURT: Go ahead.

24 RE-DIRECT EXAMINATION

25 BY MR. WRIGHT:

1 Q. Mr. Searle, concerning the UAMPS issue, are  
2 the individual members of UAMPS able to decide for  
3 themselves the kinds of projects they are willing to  
4 participate in and buy power from?

5 A. Yes. There is not a project that UAMPS has  
6 been involved in that requires participation by any of  
7 their members. Each member can choose, through  
8 approval of their city councils, to participate to any  
9 extent in any of the UAMPS projects.

10 Q. Who, from Blue Castle, is the contact, primary  
11 contact with PacifiCorp?

12 A. Aaron Tilton and myself.

13 Q. And what's Rob Graber's role?

14 A. He is an economist and, if there are economic  
15 questions that either we have or any of the-

16 Q. I mean in connection with PacifiCorp.

17 A. He is responsible for handling our evaluation  
18 of the IRP's and of that process, the information that  
19 we would make available to Rocky Mountain as part of  
20 their IRP process.

21 Q. Did-is PacifiCorp a buyer of power from the  
22 IPP project?

23 A. Yes.

24 Q. When did that arrangement begin? In other  
25 words, when did PacifiCorp agree to buy the power from

1 IPP?

2 A. Originally, they made a decision and entered  
3 into a contract for twenty-five percent of the output  
4 of the original IPP project and would have made that  
5 decision in approximately 2004 to, maybe, 2001 or '02.  
6 Later, they requested that contract amendments occur  
7 reducing their participation in the project to four  
8 percent.

9 Q. At what stage was the development of the IPP  
10 project when PacifiCorp agreed to buy power?

11 A. The project documents for the ownership and  
12 the power sales contracts were completed in, maybe,  
13 2001 or '02. At that time, Utah Power & Light, who was  
14 the predecessor of Rocky Mountain Energy, asked the  
15 State Legislature to amend the statutes requiring that,  
16 in spite of those existing contracts, that  
17 Intermountain Power Agency offer up to twenty-five  
18 percent of the output of that project--to offer up to  
19 fifty percent of the output of that project to Utah  
20 utilities and required a minimum of twenty-five percent  
21 to be executed by contracts. The Legislature passed  
22 that legislation requested by Utah Power & Light, at  
23 which time the contracts were all amended to give Utah  
24 Power & Light twenty-five percent of the output of that  
25 plant.

1 Q. My question, though, is at what stage of  
2 development was the IPP project when PacifiCorp agreed  
3 to buy power?

4 A. Prior to construction, but after the original  
5 execution of all of the project contracts.

6 Q. Okay and, so, the permits, at what stage were  
7 the permits for the development of that project?

8 A. The permits had not yet been issued, but were,  
9 when Rocky Mountain executed the contracts, the permits  
10 were granted within one year of that period of time.

11 MR. WRIGHT: Nothing further, Your Honor. Thank  
12 you.

13 THE COURT: Anything on those items, Ms. Swensen?

14 MS. SWENSEN: Nothing at this time. Thank you,  
15 Mr. Searle.

16 THE COURT: Ms. Valdes?

17 MS. VALDES: No.

18 THE COURT: You may step down. Thank you, Mr.  
19 Searle. Next witness?

20 MR. WRIGHT: Good time for a quick break?

21 THE COURT: Yes. Let's take a break. We'll be  
22 back on the record about ten minutes—let's see, in  
23 about ten minutes, about five minutes before 11:00.  
24 Court will be in recess.

25 [Recess.]

1 BAILIFF: Please rise.

2 THE COURT: We're on the record in Case 1207009,  
3 Heal Utah, et al. v. Kane County, et al. The attorneys  
4 for the parties are present. Mr. Wright, if you would  
5 like to call your next witness.

6 MR. WRIGHT: Yes, Your Honor. Applicants call Dr.  
7 Glen George.

8 THE COURT: Dr. Glen George? Is that correct?

9 MR. WRIGHT: Yes.

10 THE COURT: If you would raise your right hand,  
11 Dr. George.

12 GLEN RUSSELL GEORGE, PH.D. called as a witness by  
13 the defendants, being first duly sworn, was examined  
14 and testified on his oath as follows.

15 THE COURT: Please have a seat, Sir.

16 DIRECT EXAMINATION

17 BY MR. WRIGHT:

18 Q. Good afternoon, Dr. George. Full name,  
19 please?

20 A. Glen Russell George.

21 Q. Who do you currently work for?

22 A. I'm currently a partner with KPMG.

23 Q. What is KPMG?

24 A. KPMG is a large accounting and consulting  
25 firm.

1 Q. And in what areas are you a consultant?

2 A. I'm the co-head of the economic and regulatory  
3 consulting practice. I work in energy economics,  
4 primarily, with a focus on nuclear power in addition to  
5 some other technologies.

6 Q. Tell the Court where you went to school.

7 A. I attended Cornell University as an  
8 undergraduate. Studied engineering. Stayed on there  
9 and did a master's degree in business administration.  
10 I served in the Nuclear Navy, on active duty for five  
11 years, at the headquarters organization called the  
12 Office of Naval Reactors. I attended the nuclear  
13 engineering program that they operate at the Bettis  
14 Atomic Power Laboratory in Pittsburgh. After that, I  
15 went to Harvard University and earned a doctor of  
16 philosophy degree in public policy with a focus on  
17 nuclear regulation.

18 Q. A Navy man.

19 A. Yes, Sir.

20 Q. I'm former active duty Air Force and, in terms  
21 of your professional background, would you describe  
22 what you've done prior to joining KPMG?

23 A. So, in the Nuclear Navy, I was a nuclear  
24 engineer for five years. I, then, served as a civil  
25 servant at the defense nuclear facility safety board,



1 full-time for one year and, then, part-time for three  
2 additional years, and since earning the Ph.D., I've  
3 worked, continuously, as a consultant or financier in  
4 the energy sector, with a focus on electric power and,  
5 within that, a focus on nuclear energy. I've worked  
6 for several consulting firms, including, most recently,  
7 KPMG.

8 I also was the co-head of the Global Energy  
9 Capital Markets Group at Namura Securities, the big  
10 Japanese investment bank.

11 Q. Would you highlight one or two of the more  
12 significant energy economic projects or areas of  
13 testimony that you provided previously?

14 A. In terms of my non-testifying work, I've done  
15 extensive due diligence support for the U.S. Department  
16 of Energy, Office of Loan Guaranty programs. So, for  
17 example, I provided financial due diligence support to  
18 the DOE on all four nuclear loan guaranty applications  
19 that the Department of Energy received.

20 I've also worked, extensively, for virtually all  
21 the major nuclear utilities and nuclear vendors in the  
22 U.S. and elsewhere in the world. I've advised foreign  
23 governments on their nuclear programs, including,  
24 currently, the government of Japan, and I've worked,  
25 interestingly, against a number of nuclear utilities

1 acting as an expert witness on behalf of the U.S.  
2 government in spent nuclear fuel cases.

3 Q. And what was the nature of those—of the work  
4 on behalf of the Department of Energy?

5 A. The loan guaranty work or the testimony?

6 Q. Testimony.

7 A. That testimony was in cases involving spent  
8 nuclear fuel disposal. The government entered into  
9 contracts with all the nuclear utilities to dispose of  
10 spent nuclear fuel in a long-term repository. There is  
11 no long-term repository. The government has admitted  
12 it's in breach of those contracts and, so, the  
13 utilities sue the government to get paid for their out-  
14 of-pocket expenses in storing that spent nuclear fuel.

15 However, the utilities get—not to put too fine a  
16 point on it—creative in those suits and, so, the  
17 Department of Justice, acting on behalf of the  
18 Department of Energy, retains experts, including  
19 myself, to opine as to the appropriateness of the  
20 elements included in those—in the suits filed by the  
21 nuclear utilities.

22 Q. So, your job was to beat them up on their  
23 damages case?

24 A. Exactly.

25 Q. All right. Are you peer review published?

1           A. Yes, I am.

2           Q. Would you highlight, say, the most recent  
3 publications?

4           A. Sure. I've been a frequent conference speaker  
5 at the American Nuclear Society, the Center for  
6 Research and Regulated Industries, at Rutgers'  
7 University and elsewhere and have written, recently,  
8 about, for example, a portfolio theory and supply to  
9 generation assets and spoke at a conference on that  
10 topic.

11          Q. What does it mean to be peer review published?

12          A. It means that others with expertise in the  
13 field will review the paper to ensure that it's  
14 appropriately researched, prepared, written and meets  
15 the basic standards for scholarship.

16          Q. What are some of the journals or publications  
17 where you've published?

18          A. For example, during my Ph.D. studies, I was a  
19 major participant in a research program called  
20 Cooperative Denuclearization. This was a series of  
21 peer reviewed articles prepared at the Kennedy School  
22 of Government at Harvard, where I did my studies,  
23 looking at cooperative ways the U.S. and the former  
24 Soviet Union could act together in their nuclear  
25 sectors.

1 Q. And would you identify the areas where you  
2 have been retained in this case on behalf of Blue  
3 Castle?

4 A. In this case, I've been retained to opine on  
5 four issues. One is the economic feasibility of this  
6 project. The second is the need for power in Utah and  
7 the region, more broadly. The third is the consistency  
8 in the assumptions made and the business model proposed  
9 by Blue Castle with those used by other nuclear  
10 developers and, finally, to opine on the portfolio  
11 effects and the embedded optionality in the project as  
12 proposed.

13 Q. All right and we'll get to those individually.  
14 Would you describe the preparation you've done for  
15 today's testimony in terms of materials reviewed and  
16 sources consulted?

17 A. Sure. I reviewed my own expert report and I  
18 reviewed the materials consulted, at least the  
19 important ones. I also reviewed the expert report of  
20 Dr. Mark Cooper.

21 Q. And, in terms of the analysis in developing  
22 your own report, what kinds of sources did you look to?

23 A. A lot of it relies on my own economic model.  
24 So, I have a model of levelized energy cost that I've  
25 used in many different projects over the years. So, I

1 rely on that. I relied on the economic model provided  
2 by Blue Castle Holdings. I also relied on some  
3 generally used sources, for example, having to do with  
4 portfolio theory and options theory.

5 Q. All right and, as part of your work at KPMG,  
6 generally, and in this case, specifically, have you  
7 stayed current in terms of ongoing developments in  
8 nuclear energy in the United States?

9 A. Yes. That's a central part of my work.

10 Q. Would you summarize for us the recent  
11 developments in nuclear energy just in the United  
12 States?

13 A. Sure. In the United States, nuclear energy is  
14 a very interesting position. We have, for the first  
15 time in a decade, in several decades, several new  
16 nuclear plants under construction, five different units  
17 right now, which exceeds the number of new nuclear  
18 units under construction, as I say, since the 1980's or  
19 early 1990's.

20 At the same time, there are challenges, financial  
21 and economic challenges, faced by certain of the  
22 existing nuclear plants, the smaller ones, the one-of-  
23 a-kind plants, ones in remote areas of the United  
24 States, where they cannot rely on high prices of  
25 natural gas and high prices of power and, therefore,

1 they're re-evaluating the financial viability of those  
2 plants.

3 Q. Can you give me an example of plants that are  
4 re-evaluating financial viability?

5 A. I think it's safe to say that all plants,  
6 whether nuclear or non-nuclear, in an ongoing effort,  
7 evaluate their economic or financial viability. That's  
8 part of the business. There have been several nuclear  
9 plants, very recently. In fact, even since I wrote my  
10 expert report in this case, four plants have decided to  
11 shut down. One, in particular, Kewaunee, for financial  
12 reasons.

13 Q. Kewaunee is where?

14 A. It's in Wisconsin. Three others, primarily,  
15 for non-economic reasons. There's the Crystal River  
16 plant in Florida, the San Onofre plant in California  
17 and Vermont Yankee.

18 Q. And what are the non-economic reasons for  
19 those plants' closures?

20 A. They are technical in nature, primarily. In  
21 the cases of Crystal River, there's a problem with  
22 containment. In the case of San Onofre, there's a  
23 problem with the steam generators that were replaced  
24 recently. Vermont Yankee is a much more complex  
25 matter. There was a lot of political opposition and

1 litigation in Vermont and it's also been, for a long  
2 time, a troubled plant in terms of its technical  
3 operation.

4 Q. Troubled in what way?

5 A. Just in terms of its operational profile,  
6 reliability, capacity factors. It's not performed up  
7 to the standard set by the rest of the U.S. nuclear  
8 fleet.

9 Q. In terms of vintage, where does Vermont Yankee  
10 rank?

11 A. It's one of the older plants in the United  
12 States and, in fact, I think it's important to  
13 emphasize that, while one can look at the—for many  
14 years, we had 104 operating plants and soon—or, now, we  
15 have 99 and, so, one can look at that and say, wow.  
16 That's a major decrement in nuclear power in the U.S.  
17 and I draw a really different conclusion; which is that  
18 we still have 99 operating plants which are operating  
19 as well as they've run in their entire history and they  
20 make nearly twenty percent of our electric power. So,  
21 that's a real, I think, success story for the sector.

22 Q. And five under construction.

23 A. And five units under construction, that's  
24 correct.

25 Q. Would you identify where those units are?

1           A. Sure. One is at the Tennessee Valley  
2 Authority. One is in South Carolina, and that's South  
3 Carolina Electric & Gas, and one is in Georgia and  
4 that's Georgia Power. Two units each in the case of  
5 South Carolina Electric & Gas and Georgia Power.

6           Q. And Georgia, right. When you talk about unit,  
7 you mean a reactor?

8           A. Correct.

9           Q. Now, you mention an area that we're going to  
10 talk about in terms of portfolio and optionality. Does  
11 that go to the nature of the investment attractiveness  
12 of nuclear energy?

13           A. It does, for sure. A simple one-time  
14 calculation of net present value making a single set of  
15 assumptions can be very misleading in terms of the  
16 value of a nuclear or any projects.

17           Q. Okay. Are you familiar with Part 52 of  
18 Section 10 of the Code of Federal Regulations?

19           A. Yes, I am.

20           Q. And what is it?

21           A. Part 52 is an alternative to the older part 50  
22 licensing procedure. Part 52 was an effort, in the  
23 mid-1990's, to create a more streamlined approach to  
24 nuclear licensing and one which would include embedded  
25 optionality in a site. So, as we've heard described in



1 early testimony, there's the opportunity to get an  
2 early site permit and, then, to so-called bank that  
3 permit for an initial period of 20 years and that could  
4 be extended for up to another 20 years beyond the first  
5 period.

6 Q. And, in your opinion, how does Pat 52 aid, if  
7 it does at all, the development of new nuclear in this  
8 country?

9 A. I think there are two sides to that question.  
10 One is that there were, I think, there was excessive  
11 optimism in the sector regarding what Part 52 and some  
12 other initiatives, for example, the loan guaranty program  
13 I described, what benefits they could bring to the  
14 nuclear sector and how quickly new nuclear deployment  
15 would proceed in the United States. I think there was  
16 a little bit of hype around the nuclear renaissance as  
17 it unfolded in the first decade of this century.

18 Part 52 was part of that. There was an  
19 expectation that this one-stop licensing would make it  
20 significantly easier to license and, therefore, this  
21 would help unleash a significant resurgence in the  
22 nuclear sector. I think we've seen a major nuclear  
23 renaissance. It's been overseas, primarily, in places  
24 like China. In the U.S., it's been much more muted and  
25 measured and, so, Part 52 does aid new nuclear

1 development by embedding this optionality of licensing  
2 by design on the part of a vendor, and licensing a site  
3 on the part of a developer and, then, allowing those to  
4 come together in a combined license.

5 There's a certain simplicity and beauty to that.  
6 I think that embedded optionality is an important part  
7 of the nuclear sector going forward, certainly an  
8 important part of the business model of Blue Castle  
9 Holdings, as I understand it.

10 Q. That was actually my next question. Is that  
11 how you understand the Blue Castle model?

12 A. It is. It is how I understand it and I think  
13 it's really an important lens through which one needs  
14 to view the issue of economic feasibility.

15 Q. Now, in terms of optionality, what does that  
16 approach allow a developer to do in terms of—think  
17 about it, I guess, as decision points. You know, you  
18 get an ESP. You don't have to keep going, in other  
19 words.

20 A. That's right. The phrase I use, typically, is  
21 off-ramps and, so, a developer may not want to commit  
22 several or many billions of dollars at times zero and  
23 say we're absolutely committed, right this minute, to  
24 develop this large, complex project and it's not just  
25 nuclear. It's any kind of project. They want to be

1 able to retain the option to proceed with development  
2 or go to something different as events in the world  
3 unfold.

4 Q. And the ESP, under Part 52, allows for that?

5 A. Yes. That's a really critical part of that  
6 Part 52 process where the early site permit can be  
7 obtained and, then, banked for a lengthy period of time  
8 as the world changes and the world changes very  
9 rapidly.

10 Q. And, so, in terms of economic conditions, how  
11 does that affect the developer's ability to gauge those  
12 conditions or hedge against them?

13 A. Sure. The idea of an ESP as a real option to  
14 build means that, for a lengthy period of time, for 20  
15 years, maybe 40 years, the developer can hold onto the  
16 site, this licensed site, and can, as major drivers,  
17 economic and financial drivers change, can decide to  
18 proceed to the next stage of development or to take one  
19 of those off-ramps and say we want to do something  
20 different or nothing at all.

21 Q. Would you identify or describe the concept of  
22 portfolio theory?

23 A. Sure. Portfolio theory is most commonly  
24 encountered in the world of finance and, so, we'll meet  
25 with—any of us may meet with our financial advisor to

1 talk about retirement savings and a really important  
2 part of creating a portfolio for retirement is ensuring  
3 diversity of assets in your retirement account. You  
4 don't want all your eggs in one basket. It's really  
5 foolhardy to have all of your savings in a particular  
6 asset class and, certainly, not in a particular company  
7 and, so, portfolio theory developed from that base of  
8 understanding the importance of asset diversity in a  
9 portfolio of different assets and applying that concept  
10 to real things like portfolios of generation assets.

11 Q. Such as? When you talk about generation  
12 assets, what do you mean?

13 A. So , if I'm a utility company or a power  
14 generator, I don't want all my eggs in one basket, in  
15 other words. I don't want all my generation to be  
16 fossil. For example, ninety-eight and a half percent  
17 of Utah's generation, right now, is fossil powered. I  
18 think a rational planner, profit maximizing asset owner  
19 or developer, would look at that and say that's,  
20 really, imprudent. Just as you don't want 98.5 percent  
21 of your retirement savings in a single stock or bond,  
22 or even a particular asset class like equities or fixed  
23 income, so it is foolhardy for a particular utility or,  
24 frankly, for a state to have all of its eggs so  
25 concentrated in one basket.

1 Q. And is that issue even further driven by  
2 ongoing uncertainty concerning climate change issues,  
3 emissions issues that you've heard some testimony about  
4 today?

5 A. Absolutely. So, there's some really key  
6 drivers to the value of different assets in your  
7 portfolio and your assessment of their cost, levelized  
8 cost. So, that's taking all the cost, over time, and  
9 smoothing it over time. You can look at the levelized  
10 cost of a lot of different source of energy, but those  
11 calculations are driven by factors which are unknown  
12 and unknowable at any point in time.

13 We can have an opinion as to the direction they  
14 may trend over time, but we don't know exactly how they  
15 will trend and those key factors, which affect the  
16 value of generation, include the prices of natural gas,  
17 macro-economic growth, which leads to growth in the  
18 demand for power and, also, the capital and other costs  
19 of competing sources of energy and the trajectory of  
20 global climate change and any legislation we may have,  
21 over time, regarding carbon emissions.

22 Q. Such as stricter EPA regulations on emissions.

23 A. Well, that's right. Even very recently we've  
24 seen, within the Obama Administration, some very major  
25 policy initiatives which would really tend to make life

1 difficult, financially and otherwise, for fossil  
2 generators, particularly for coal, over time.

3 Q. Would you talk about the concept of risk  
4 adjusted returns in terms of within the umbrella of  
5 energy economic analysis?

6 A. It's a really key concept, risk adjusted  
7 returns, because you can look at two assets and say,  
8 ah. This one, over time, has had ten percent returns  
9 and this one has had five percent returns. I want to  
10 go for the one with the ten percent returns.

11 Well, the reality is that, maybe, the one with the  
12 higher return has posed higher risk and, indeed,  
13 there's, usually, correlation between the risk posed by  
14 a particular asset and the return that investors demand  
15 to invest in that asset and where this really—I think  
16 where the rubber hits the road, in terms of a  
17 generation portfolio, is the somewhat counter-  
18 intuitive, but very real effect, as follows. That is,  
19 if you have an asset which is uncorrelated with your  
20 existing portfolio, even if it's more expensive, on  
21 average, than the rest of the portfolio, because it's  
22 uncorrelated, it can bring down the risk adjusted cost  
23 or increase the risk-adjusted returns of the whole  
24 portfolio.

25 Q. Put that in concrete terms. Give us a

1 concrete example.

2 A. The example that is used in one of the key  
3 textbooks in this sector is--it's the salad analogy,  
4 which is very interesting. So, you have a salad made  
5 mostly of lettuce, but with some other things added.  
6 Lettuce varies dramatically, day-to-day, at the market.  
7 It could be a dollar a pound. It could be three  
8 dollars a pound. It varies dramatically, but it's  
9 fairly cheap, overall. Typically, it's still cheap.

10 Strawberries. You like strawberries in your  
11 salad. It's what's in the book. Strawberries are very  
12 expensive. Maybe they're four dollars a pint, but the  
13 price is really known. They don't vary at all--barely,  
14 and, so, you take this very expensive box of  
15 strawberries and you put it in your salad over time.  
16 It's way more expensive than the lettuce in your salad,  
17 but on a risk-adjusted basis, it will bring down the  
18 cost of your salad, on average.

19 Q. How so? How does that work?

20 A. Because some days, you're going to the market  
21 and you're spending three dollars per pound for your  
22 lettuce and, some days, yeah. Some days, it's cheaper  
23 but, some days, it's very expensive. So, on average,  
24 your salad can be, potentially, very costly because of  
25 this uncertainty, this risk. Some risk and some

1 uncertainty in the price of lettuce, but you know the  
2 price of strawberries. Even though it's high, it  
3 brings down the risk-adjusted price of your salad.  
4 Your salad could be very expensive. You go to the  
5 market several weeks or months or years in a row. The  
6 price of lettuce could be quite high, but you know the  
7 price of strawberries. It's known. It's high, yes,  
8 but it's known and it lacks—basically, a zero variance,  
9 co-variance with the price of lettuce.

10 Q. Doesn't have the volatility.

11 A. It doesn't have the volatility with respect to  
12 the changes in weather and other things that drive  
13 lettuce. It's an uncorrelated asset. That's why you  
14 might want to have stocks and bonds in your retirement  
15 portfolio.

16 Q. Because they don't rise and fall together.

17 A. Exactly.

18 Q. Let's put that in terms of a fuel base  
19 portfolio. If you've got coal, gas, nuclear and,  
20 maybe, some wind and solar, which, of course, has no  
21 fuel cost at all, but describe that in terms of how  
22 those things work together. Coal and gas tend to rise  
23 and fall together?

24 A. Coal and gas are fairly uncorrelated in terms  
25 of the fuel price itself. Unfortunately, though,



1 they're very highly correlated in terms of the  
2 regulatory risk that they are subject to; mainly, the  
3 risk that will have—and as I honestly think we will,  
4 over time—a fairly aggressive climate change approach,  
5 maybe a carbon tax, maybe some sort of cap and trade  
6 regime. We don't know what form it will take but, over  
7 time, there's a likelihood there will be some sort of  
8 control on greenhouse gas emissions and, therefore,  
9 both natural gas and coal, both being fossil fuels,  
10 will be subject to the self-same regulatory risk.

11 Q. How does nuclear fit into that equation  
12 compared to coal and gas?

13 A. It's an uncorrelated asset. It's the  
14 proverbial strawberries that are not correlated in  
15 price with the lettuce in your salad, or stocks versus  
16 bonds or bonds versus stocks. The nuclear is  
17 relatively uncorrelated in terms of this really major  
18 driver; namely, the potential for climate change  
19 legislation.

20 Q. Would you—you've got the binder in front of  
21 you of exhibits. Would you turn to Exhibit 60?

22 A. Yes. I have that.

23 Q. Would you tell me what that is, please?

24 A. This is a print-out of the financial model  
25 that Blue Castle Holdings prepared as part of their

1 analysis and provided to me for my review.

2 Q. And if you would help me, sort of, break down  
3 what is it that Blue Castle attempts to do in this  
4 document and how does it inform your review or your  
5 opinions?

6 A. This is a very standard kind of financial  
7 model that's done not just in the nuclear sector, but  
8 across the electric power sector and, indeed, across  
9 the entire investment spectrum, whether it's energy or  
10 any other investment, and it's a cash-flow analysis  
11 and, in this instance, the sources of revenue would  
12 appear at the top and, then, subtracted off from that  
13 are various sources of cost and, then, at the bottom,  
14 there are various adjustments and, then, at the very  
15 bottom would be a net present value; which is to say  
16 the value today of the stream of cash flows over time.  
17 So, this is a very standard kind of financial model  
18 that's used—again, not just a nuclear of energy, but  
19 across the world of financial investments.

20 Q. And, so, when you reviewed this in preparation  
21 for your report and your opinions, do you, sort of, run  
22 your own analysis about the reasonableness of any  
23 assumptions that are made in the numbers that are used  
24 there?

25 A. For me, the touchstone of reviewing a model

1 like this, and of evaluating of financial viability of  
2 a project, it's really to look at the reasonableness of  
3 the assumptions and that is to say not do they, in each  
4 and every case, comport with what I, myself, would  
5 select in any particular model, but do they fall within  
6 the range of generally accepted assumptions that are  
7 used in models like this, not just by myself, but by  
8 others in the sector as well.

9 Q. And did you conclude or reach any conclusion  
10 concerning the reasonableness of the assumptions Blue  
11 Castle has made?

12 A. I did reach a conclusion; which is, in my  
13 opinion, the assumptions made by Blue Castle, embedded  
14 in this financial model, fall within the range of  
15 assumptions that I've made in very similar analyses and  
16 that I've seen others in the sector make in their own  
17 cash flow and discounted cash flow analyses.

18 Q. Are there any particular assumptions or  
19 factors, features in this model, that, sort of, stand  
20 out over others in terms of feasibility for this  
21 particular project, in your opinion?

22 A. Well, I think there are a few pieces that  
23 speak to feasibility. One is, is the model—does it  
24 follow generally accepted approaches or is it, somehow,  
25 strange or unusual, off-normal, idiosyncratic? And, in

1 my opinion, there's nothing here that would be  
2 described in those terms. It's a plain, vanilla, sort  
3 of, financial model. There's nothing unusual about it.  
4 So, I think, measuring feasibility in terms of abiding  
5 by the generally-accepted norms of financial planning  
6 and analysis, this, clearly, falls within that range.

7 I think there's no assumption, which I saw, which  
8 I thought was outside the norm that I would consider  
9 for my own analysis or that I've seen used elsewhere.  
10 So, I think feasibility inheres not merely in the  
11 bottom line of something but, also, in a set of  
12 assumptions going in and taken in their totality, do  
13 these assumptions fall in ranges that are reasonable or  
14 that other people will use and I think this, clearly,  
15 meets those standards for feasibility.

16 Q. Okay. Now, when you're looking at feasibility  
17 of this project or, perhaps, any proposal for new  
18 energy, whether it's nuclear or anything else, what  
19 role does expected demand for power play in your  
20 analysis?

21 A. It's, certainly, one ingredient in  
22 feasibility. The demand for a product or a good or  
23 service is, certainly, a key element, I think, in any  
24 judgment of the economic feasibility of a proposed  
25 project.

1 Q. And, based on your analysis, have you reached  
2 an opinion as to the economic feasibility of the  
3 proposed Blue Castle project?

4 A. I have.

5 Q. And what is that?

6 A. My opinion is that the growth in demand in  
7 Utah, driven by macro-economic and demographic growth,  
8 taken in aggregate in the coming decades, more than  
9 justifies the addition and capacity proposed by Blue  
10 Castle Holdings.

11 Q. And let's talk about additional current  
12 sources of fuel. Right now, in Utah, it's, pretty  
13 much, a fossil fuel-based generating source. Is that  
14 right?

15 A. That's correct.

16 Q. And let's talk about prices for fossil fuels,  
17 in particular, gas prices. You would agree with me  
18 that they are, currently, quite low?

19 A. They are.

20 Q. Gas is really cheap right now.

21 Q. Why is that?

22 A. It's really due to one factor, primarily, and  
23 that's not conventional gas production. So, this is  
24 production of natural gas from shell formations,  
25 particularly in Pennsylvania, Texas and some other

1 places. A very expansive field of gas. For example,  
2 and this is just one example, in the Marcellus Shale  
3 Formation in the Appalachian part of the United States  
4 and some modern production techniques, which would  
5 include hydraulic fracturing, sometimes called  
6 fracking, and horizontal drilling. Combined together,  
7 those create a significant new supply of natural gas.

8 Unfortunately, that's a new supply. It runs the  
9 risk of being, in fact, in some observance, already is  
10 a glut of supply and, so, we're seeing the pendulum  
11 possibly begin to swing the other way of withholding  
12 some of this new supply from the market, right now, and  
13 also the increase in interest in exporting natural gas.

14 Q. I wanted to ask you about that. What is the  
15 status of exporting American natural gas in terms of  
16 permits?

17 A. I think there are two really key factors to  
18 consider with natural gas price as with any commodity  
19 price. One is that no one knows where it's going  
20 tomorrow. Anyone who thinks he or she knows is either  
21 delusional or, if they really do, they're a billionaire  
22 and they've retired to the Cayman Islands, right? So,  
23 it's a given that no one really knows the direction of  
24 any commodity price.

25 The other is that there are all kinds of market

1 anomalies. Calling something a commodity, I think,  
2 tends to submerge some of these market anomalies from  
3 the discourse and, so, in the United States, natural  
4 gas is very cheap. Not a whole lot is exported. In  
5 the world, it's really costly right now. In Japan,  
6 natural gas is \$14.00 per million BTU's. You're  
7 talking quadruple the price as it is in the United  
8 States. In Europe, it's \$9.00 or \$10.00 per million  
9 BTU's. You're talking triple the price as that same  
10 resource is in the United States and, so, there's a  
11 tendency—there will be, and already is a tendency to go  
12 and export this U.S. resource which will tend to make  
13 U.S. prices rise to meet the world price and, so, right  
14 now, we have, I believe, three different LNG, liquefied  
15 natural gas, export licenses have been granted by the  
16 U.S. Department of Energy.

17 Q. How recently was that?

18 A. One was just in recent weeks and one was a  
19 couple of months before that. So, we're talking two of  
20 the three just in this calendar year and I believe  
21 there are 18 pending. So, this could, potentially, be  
22 a market mover in terms of the price of natural gas in  
23 the United States, market mover meaning to increase the  
24 price of natural gas.

25 Q. Yes and issues concerning emissions, clean

1 air, climate change issues as to natural gas have yet  
2 to be addressed? I think we already know where coal is  
3 in that regard. Natural gas, kind of, next on the  
4 chopping block?

5 A. So, if there is, if we do have any kind of  
6 comprehensive greenhouse gas legislation in the United  
7 States, natural gas will be in the cross-hairs just  
8 about as much as coal on a per unit of carbon dioxide  
9 equivalent release into the environment and, so, the  
10 headline is, well, natural gas emits only half as much  
11 CO2 as from burning it to produce electric power as  
12 coal and, while that may be true, natural gas also  
13 leaks when it's produced and stored, transported, and  
14 methane, which natural gas is mostly methane, is a  
15 really potent greenhouse gas, 20 or 30 times the effect  
16 on climate change per molecule as carbon dioxide and,  
17 so, I would anticipate a fairly stringent regulatory  
18 regime surrounding natural gas as part of any  
19 comprehensive greenhouse gas emissions legislation.

20 Q. You understand the term base load power, what  
21 that means?

22 A. Yes, Sir. I do.

23 Q. What are the current sources of base load  
24 power in this country?

25 A. The current sources are nuclear, which is the



1     only carbon free source of base load power that we  
2     have. It's the only dispatchable source of carbon free  
3     power that we have.

4             Q. What do you mean by dispatchable?

5             A. Dispatchable means you can flip and switch and  
6     it's there. Can't really do that with the wind or  
7     solar. They are important. They should be part of the  
8     blend, the mix, the portfolio, but it can't be all of  
9     it and, so, they can't really even be more than twenty,  
10    thirty percent of it for a whole variety of technical  
11    reasons and, so, nuclear is a really important source  
12    of base load power. Coal is an important, but really  
13    decreasingly important, source of base load power and  
14    natural gas.

15            Q. And you mentioned fracking. We'll use that  
16    term because I think we all get it. Controversial, to  
17    say the least.

18            A. It is controversial. There's no doubt about  
19    it. There are states with moratoria in place on  
20    fracking, including New York State and New Jersey, my  
21    home state, where there's no fracking, at all. There  
22    are significant concerns about groundwater or surface  
23    water contamination, concerns about simply transporting  
24    the gas that's produced through fracking through small  
25    pipes which are, currently, not regulated in some

1 jurisdictions and, so, it's a very controversial source  
2 of energy. There's no doubt about that.

3 Q. What effect could that controversy have on the  
4 price of natural gas?

5 A. It's uncertain. I mean, that's, really, the  
6 issue we're dealing with. It, of course, has the  
7 potential significantly to increase the cost of natural  
8 gas. We don't know by how much. We don't know when  
9 and, so, that's why it's really important that a  
10 generation planner and owner/operator; an entire state,  
11 like Utah; an entire energy planning organization, like  
12 the WECC, why it's really important to have a balance  
13 of generation sources, which is to say fuels, in the  
14 mix, rather than having all the eggs in the fossil fuel  
15 basket.

16 Q. Would you define the term levelized cost?  
17 What does that mean?

18 A. Levelized cost, which I touched on a little  
19 earlier in my testimony, is a measure of the cost of  
20 the technology, in this case energy technology, which  
21 takes all the direct costs of the generation--asterisk  
22 direct. I'll come back to that in a moment--and sums  
23 them up, over time, and, then, smears them over,  
24 averages them over the projected life of that asset.

25 Q. Okay and is that a, sort of, standard analysis

1 used to evaluate cost of new production, whether it's  
2 coal, gas, nuclear?

3 A. It is a standard yard stick. It's one of  
4 several. It's, of course, like any yard stick. It's  
5 not the only one. There are some other measures out  
6 there and it's, really, also important to emphasize  
7 that it's incomplete in many respects.

8 Q. How so?

9 A. So, in looking at the cost of generation, it  
10 doesn't necessarily—in fact, it doesn't look at the  
11 cost of some associated costs. For example, renewables  
12 tend to be very intermittent. The sun doesn't shine  
13 all the time. The wind doesn't blow all the time and  
14 they tend to be very remote from population centers  
15 and, so, first of all, we need a lot of back-up power,  
16 stand-by power, spinning reserves or other kind of  
17 reserve power for those renewables and you need a  
18 significant transmission system investment to bring the  
19 power to market where the people live.

20 So, for example, Germany is relying more heavily  
21 on renewables. It needs to double its investment in  
22 the transmission grid, in the coming years, just to  
23 handle the transmitting the renewable energy, mostly  
24 wind, some solar, from the northern part of Germany to  
25 the southern part of Germany, where a lot of the

1 industry is.

2 Q. So, let me make sure I understand correctly.  
3 You said, in terms of wind and solar, those costs are  
4 not included in the typical levelized cost analysis?

5 A. That's correct.

6 Q. So, that's one of its weaknesses?

7 A. It's a tremendous weakness of levelized cost;  
8 which is it tends to penalize those sources of power,  
9 like coal and nuclear, where the cost of transmission  
10 is fairly minimal relative to renewables where the cost  
11 of transmission and back-up power tend to be more  
12 significant.

13 Q. So, if you—if levelized cost isn't necessary—  
14 well, it's not the only, maybe not the best, what other  
15 sorts of models or analyses do you look at to compare  
16 sources so that you're doing apples-to-apples?

17 A. Sure. It's, probably, the single best yard  
18 stick out there for apples-to-apples, but it's  
19 important to note it's an imperfect one, but there are  
20 others out there as well. I mean, one can, certainly,  
21 look at a discounted cash flow for a particular project  
22 and flow different technologies in and say which one  
23 comes out better or worse.

24 There's, of course, there are significant  
25 downsides to any point estimate. You need to look at a

1 range of parameter values, of assumptions, to see how  
2 reasonable any of them might be. One can also look just  
3 at the capital cost and that's a commonly used yard  
4 stick. Unfortunately, again, it really penalizes some  
5 source of energy which tend to be more costly, up  
6 front, because of very high capital cost, even if, over  
7 time, they've had very low operational, maintenance and  
8 fuel costs.

9 Q. Let's talk about that. Obviously, no secret,  
10 nuclear has high capital costs. It costs a lot to  
11 build a plant.

12 A. It does.

13 Q. And that's what you're talking about in terms  
14 of capital cost is to get the thing up and running?

15 A. That's right.

16 Q. And, then, in terms of production costs,  
17 however, that's a different category, isn't it?

18 A. It is. It is and, so, nuclear is costly in  
19 terms of capital costs. There's no doubt about that.  
20 However, it has very low ongoing operations,  
21 maintenance and fuel costs.

22 Q. Why is that?

23 A. Because uranium is cheap. The fuel is cheap  
24 and the amount of energy that can be extracted through  
25 fission is orders of magnitude more from the energy

1 that can be extracted from combustion. We're talking  
2 about a difference of sixty million, a factor of sixty  
3 million difference per atom of combustion--of fission  
4 relative to combustion. So, it's, really, a different  
5 piece altogether. So, nuclear requires a big, upfront  
6 investment in the capital but, then, it's, basically,  
7 very, very low cost for the remainder of its life  
8 which, also, by the way, is very, very long.

9 Q. I was just going to ask that. Your typical  
10 plant is licensed for how long?

11 A. So, the new licenses are for 60 years. The  
12 older licenses were 40, with re-licensing for an  
13 additional 20. Either way, you're looking at a 60-year  
14 asset. I would have every expectation that a new  
15 nuclear plant, being built now or in the near future,  
16 would have a 60-year initial period. Then, another 20  
17 or 40 or 60 years after that. There's no fundamental  
18 limit to the life of these assets.

19 You know, for example, solar panels, solar  
20 photovoltaics. There's a very predictable curve of how  
21 their production goes down over time. It's a really  
22 major financial impediment to investing in new solar.

23 Q. Okay. Are there--the scenarios of comparing  
24 generation sources, nuclear, coal, natural gas, what  
25 sort of factors do you evaluate to determine scenarios

1 where they are or are not competitive. I mean, what  
2 are the features you are looking at to determine  
3 comparativeness, again, on an apples-to-apples basis?

4 A. So, it's important to agree on a yard stick  
5 that you can use to get an apples-to-apples comparison.  
6 So, a levelized cost of energy approach are,  
7 sometimes, called levelized unit energy costs. These  
8 are, really, the same concept. That's a really common  
9 yard stick and, so, you agree on a yard stick and,  
10 then, you determine one of the key drivers and, so, the  
11 really important drivers would include things like  
12 natural gas price, would include the cost of carbon,  
13 the price of carbon in some kind of greenhouse gas  
14 emissions.

15 Q. And all of that is uncertain, isn't it?

16 A. These are tremendously uncertain, which is why  
17 it's really important, and back to some earlier  
18 questions, it's really important to build-in  
19 optionality into a project or these off ramps so as the  
20 carbon or the price of natural gas or macro-economic  
21 growth. That's another major driver, as these things  
22 become clear or more clear over time and some of this  
23 uncertainty is resolved, a project can either proceed  
24 or take one of these off ramps.

25 Q. What has the—you mentioned you're advising

1 Japan in connection with energy matters. Is that  
2 correct?

3 A. Yes, Sir. It is.

4 Q. Tell me what's going on in Japan post-  
5 Fukushima.

6 A. It's a difficult situation. It's—of course,  
7 there are the immediate problems of the Tsunami, the  
8 earthquake, 19,000 people dead from those natural  
9 calamities. So, there's the human cost from that, but  
10 in terms of the electric power market and the financial  
11 economic impacts, I think it's worth noting those  
12 things because those are the areas in which I'm  
13 advising the government of Japan.

14 As a result of the Fukushima accident, which  
15 directly affected three units that had a nuclear  
16 accident, the entire nuclear fleet of Japan was shut  
17 down. Fifty-four reactors provided something like a  
18 third of the electric power generation in Japan and, as  
19 a result, Japan has had a significant set of impacts  
20 over the past two and a half years since that policy  
21 was put in place.

22 Among other things, there's a significant shortage  
23 of electric power. The thermostats, in the summer, are  
24 set at 85 degrees in all office buildings throughout  
25 Japan.



1 Q. And you've been there during that time.

2 A. Yes. Yes, I have been and, so, you swelter at  
3 the office. The government—actually, the government  
4 issued an edict prohibiting, sort of, but strongly  
5 discouraging jackets and ties in the work place.

6 The Japanese industry has been affected by the  
7 shortage in power. Japanese greenhouse gas emissions  
8 in 2012 were 39 percent above the Kyoto targets which,  
9 by the way, Kyoto, where the major treaty governing  
10 greenhouse gas emissions was signed, happened to be in  
11 Japan. Japan takes this very seriously and the absence  
12 of nuclear, as part of their portfolio of generation  
13 assets, has really made itself felt in very tangible  
14 and unfortunate ways in Japan.

15 Q. Where do you anticipate that resolving or how  
16 would you anticipate that resolving? Are they going to  
17 turn them back on?

18 A. This is another source of uncertainty.  
19 Perhaps it's a theme we have today. We really don't  
20 know. The Japanese government would like to. The Ave  
21 government is committed to that policy, but we don't  
22 have a crystal ball. We don't really know what will  
23 happen. If I had to guess, I would say, maybe, some  
24 will be turned back on. By no means will we see 54  
25 turned back on. There are only forty some-odd

1 candidates that could be, realistically, turned back on  
2 and, so, in any event, it's a significant impact, much  
3 higher electric power prices, much higher price of  
4 natural gas both in Japan and, potentially, with a  
5 ripple effect throughout the world as the world  
6 equilibrates for this much higher natural gas price  
7 that's seen in Japan due to Fukushima.

8 Q. What has been the response of the U.S. nuclear  
9 industry to Fukushima, as well as the German decision  
10 to shut down its nuclear fleet?

11 A. So, Fukushima is, I think, in all fairness,  
12 it's been a recent head wind for the global nuclear  
13 sector. Japan, clearly, I've described their decision  
14 to shut down their entire fleet for a period of time.  
15 I think it's likely that some will restart, as I've  
16 described.

17 Germany made a similar policy decision. They're  
18 the only other country that really had significant  
19 nuclear and decided to shut down their nuclear fleet  
20 and, so, Germany has decided to shut down their nuclear  
21 fleet. They will rely, much more heavily, on nuclear  
22 power imported from France. Ironic, perhaps. They  
23 need to rely, much more heavily, on renewables from the  
24 North Sea; wind power and solar power throughout  
25 Germany. The price to the consumer is rising, very

1 significantly, in Germany as a result.

2 There have been some policy decisions to increase  
3 the robustness of nuclear plants, both existing and new  
4 ones, to accidents that may go beyond the design basis  
5 of nuclear plants. So, planning for lack of offsite  
6 power for a lengthier period of time and, so, these are  
7 working their way through the global nuclear regulatory  
8 regime, if I could call it that, but done at the  
9 national level and, so, the lessons learned from  
10 Fukushima are being built into the regulatory regime  
11 and plants, globally, and I think the nuclear sector is  
12 really good at doing that.

13 I think it's one of the best industries. It and  
14 aerospace are, typically, cited as the two best  
15 industries in terms of harnessing the lessons learned  
16 from past problems and improving performance going  
17 forward.

18 Q. Let's talk about expected power demand. You  
19 said that has informed your opinion. First of all,  
20 have you reached an opinion as to anticipated demand in  
21 Utah and its region as to whether anticipated demand  
22 justifies new nuclear power?

23 A. I have. So, I reviewed the 2011 WECC report,  
24 which looks at—

25 Q. Let me stop you there. What is the WECC?

1           A. That's the Western Electricity Coordinating  
2 Counsel. So, it's the power market for the western  
3 part of the United States.

4           Q. Okay.

5           A. And, so, they have a very macro view of the  
6 electro-power market going forward. It's broader than,  
7 I think, any of the individual IRP's, for example, that  
8 we've heard discussed in earlier testimony today. I  
9 also looked at the governor's energy policy from 2012  
10 and, so, at a macro level, I do have a view that Utah  
11 is a fast growing state whether you're looking at 1.8  
12 or 1.6 or 2 point some-odd percent growth. It's one of  
13 the very fastest growing states in the union, basically  
14 doubling in population by 2050, something like ninety-  
15 five projected population growth and, even if you  
16 believe, fervently, in demand-side management and  
17 conservation and renewables, there's no doubt, in my  
18 mind, that, at a macro level, there's a really  
19 significant demand for new generation capacity in Utah.

20           Q. Does it appear, to you, that Utah's current  
21 generation portfolio, heavily fossil-based, as you've  
22 described, is capable of meeting that demand or are we  
23 going to have to import power into Utah?

24           A. It seems likely that there will be a need to  
25 import power, certainly the ability to export fifteen

1 percent, which has been the recent pattern. Those days  
2 are limited and we've already heard testimony to the  
3 effect that some of the exporters are, now, keeping  
4 that power in Utah. So, certainly, Utah can buy some  
5 time, in terms of new generation, due to the economic  
6 down turn, due to the ability to decrease exports, but  
7 those things go only so far and, so, as you look  
8 farther into the future, there's no doubt assets  
9 retire. They wear out and they need to be replaced and  
10 Utah will need new base load power. There's no doubt,  
11 in my mind, about it.

12 When considering an asset with a 60-year lifetime,  
13 like a new nuclear plant, what's happening this minute,  
14 at a moment in time, what's even foreseen in an  
15 integrated resource plan, which is, really, a  
16 regulatorily driven document that goes out a decade or  
17 more, that, too, is of limited utility in thinking  
18 through what an entire state or region will need over  
19 the next half century or more.

20 Q. I should have asked this earlier about the  
21 Blue Castle model that you reviewed. Were there any  
22 factors, important in your mind, left out aside from  
23 the assumptions made? Is there anything missing that  
24 you think should have been there? For example, it  
25 includes decommissioning. That's something you would

1 expect to find in this kind of a model.

2 A. That's correct. So, there was no major item  
3 left out that I could identify. Looking at the model,  
4 again, as I've already opined, there's nothing that's  
5 anomalous about it, including leaving out anything  
6 major. I think, as in any model, it's really difficult  
7 to include, explicitly, what are, sometimes, called  
8 black swan events, right? Most swans are white. Once  
9 in a while, you might see a black swan and, so, this is  
10 a term of art in the world of risk analysis of  
11 something which is really unforeseen and, so, yes.

12 One can look at any model and say, hm. That  
13 doesn't really consider the black swan event of  
14 whatever it might be and those black swan events, in my  
15 mind, might include, for example, a really major  
16 disruption to world supply of fossil fuels and other  
17 oil prices, for example. That's one that, in the  
18 energy world, is, sometimes, looked at, explicitly  
19 modeled. You know, one percent likelihood of a major  
20 disruption in the world of fossil fuel supply. That  
21 particular black swan event, I think, would  
22 significantly help new nuclear, for example, but that's  
23 not included here.

24 Q. Right. Okay and have you—what is your opinion  
25 concerning the Blue Castle model and this project, in

1 particular, in terms of its investment attractiveness?  
2 Is it postured such that it is or presents, because of  
3 this, again, with the backdrop of portfolio theory and  
4 the optionality, does it provide an attractive  
5 investment opportunity?

6 A. I think it does. So, to me, it's really  
7 important to think about what the proposition is at  
8 hand. Is the proposition that Blue Castle Holdings  
9 will walk into an investment bank in New York,  
10 tomorrow, and say will you please put \$12 billion into  
11 this envelope on the table because we're going to build  
12 this project tomorrow? I don't think--first of all,  
13 that's for purely illustrative purposes and I don't  
14 mean to be glib, but at one extreme, that is a business  
15 model of would you please, investor, please give me the  
16 money, now, to deploy this technology, literally  
17 tomorrow or in the very near future, because you can  
18 earn a guaranteed return or an extremely high  
19 likelihood based on the factors, this very minute, by  
20 making that investment.

21 That's not, as I understand it, the Blue Castle  
22 model and I'm sure the Blue Castle Holdings executives  
23 can articulate it far better than I, but their model is  
24 based on resolving this uncertainty and de-risking the  
25 power market in Utah over a period of years and, so, to

1 some extent, the things that might be viewed as  
2 negative to the bone, natural gas is really cheap right  
3 now. Well, nuclear has some headwinds in the market  
4 right now. It's not the renaissance that, maybe, the  
5 media portrayed looking back five to ten years ago.

6 Those things could be viewed as negative. On the  
7 other hand, in a model that's based on de-risking the  
8 market, over a period of years, in an unfolding set of  
9 circumstances where risk is removed and the need for  
10 power and the price of alternatives is revealed, over a  
11 period of years, it makes it a very attractive model  
12 and I dare say it's not unique to Blue Castle. It's a  
13 commonly used model, now, for those investors  
14 considering technologies like new nuclear which are  
15 costly, up front, in their capital cost, but which  
16 could reap significant financial benefits over the  
17 long-term.

18 Q. So, it's, sort of, a self-propelling kind of  
19 idea; which is to say, the further along in the process  
20 they get, say to the ESP, a whole bunch of risk has  
21 been taken out for investment.

22 A. Well, that's right and, so, as each source of  
23 risk or uncertainty is reduced or eliminated, the value  
24 proposition that Blue Castle can take to investors  
25 increases both in value and the likelihood of moving



1 forward to the next step.

2 Q. And to what extent does portfolio theory  
3 inform your opinion as to investment attractiveness?

4 A. Well, I think it's a central element. No one  
5 wants to be reliant just on natural gas, even if  
6 natural gas looks very cheap now, and even if you are  
7 of the opinion that it's likely to remain cheap for the  
8 foreseeable future, we don't know what's likely to  
9 happen over the next 60 years and it's not just natural  
10 gas, but it's the price of carbon and some other major  
11 drivers. We don't know what's likely to happen and,  
12 so, as these sources of risk and uncertainty are  
13 resolved, the value becomes more evident—again, the  
14 value focusing on the whole portfolio and the  
15 contribution nuclear can make to a diversified  
16 portfolio.

17 Q. Right and you may have covered this, but under  
18 the investment attractiveness notion, real option  
19 value, real optionality, how does that play into the  
20 discussion?

21 A. Sure. Option theory is another one of these  
22 topics where one's eyes can glaze over. I freely  
23 admit. The way I view optionality is, really, it's  
24 very concrete. My kids, sometimes, like the lunch they  
25 can buy at school and, sometimes, they don't like it at

1 all and refuse to eat. So, I don't know, any day,  
2 whether they are going to buy lunch or school, or not,  
3 but I know they will eat a peanut butter sandwich every  
4 day.

5 So, my wife and I pack, every day, a peanut butter  
6 sandwich in each kids' lunch box so they have the  
7 option to each peanut butter if whatever is on the menu  
8 that day happens not to suit their fancy and that's  
9 really the notion of an option; that is, you're willing  
10 to pay something, willing to pay real money to give  
11 yourself the option or the alternative or the  
12 possibility of exercising something, tomorrow or at  
13 some point in time, where you don't know whether you  
14 will or not. It could be great. It could be not so  
15 good.

16 You just don't know, but you are willing to invest  
17 money, up front, because you want that option open to  
18 you, going forward, and that's a really central part of  
19 the Blue Castle model, this notion that you might not  
20 be willing to invest 12 billion dollars, or some chunk  
21 of money, to build a nuclear plant this minute, but  
22 you're, certainly, willing to invest some number on it,  
23 I don't know whether a hundred million dollars, but  
24 some number is the right number to keep that option  
25 open going forward.

1 Q. Okay, got it.

2 MR. WRIGHT: Nothing further, Your Honor.

3 THE COURT: Thank you. It's, now, noon. So, why  
4 don't we take a break until 1:00. This seems like a  
5 good time to take that break, a natural break. Court  
6 will be in recess, then, until 1:00. Thank you.

7 BAILIFF: Please rise.

8 [Recess.]

9 THE COURT: Good afternoon, ladies and gentlemen.  
10 Please be seated. We'll be back on the record in Heal  
11 Utah, et al. v. Kane County Water Conservancy District,  
12 et al. This is Emery County Case 1207009. Counsel for  
13 all three parties are present. Dr. George was on the  
14 stand. If you would come back up, please, Sir. Cross-  
15 examination, Ms. Swensen?

16 MS. SWENSEN: Yes.

17 CROSS-EXAMINATION OF DR. GEORGE

18 BY MS. SWENSEN:

19 Q. Hello, Mr. Graber.

20 A. Dr. George.

21 Q. Dr. George. I am completely sorry. That was  
22 a [inaudible]

23 A. That's all right.

24 Q. Let's just switch tactics, then. Dr. George,  
25 what is your hourly rate in this case?

1 A. Five hundred twenty-five dollars an hour.

2 Q. And how much have you been paid by Blue Castle  
3 to date?

4 A. To date, something like five thousand dollars.

5 Q. You testified, earlier on direct, that you've  
6 had experience in the Nuclear Navy and various roles  
7 providing financial support to DOE, etc. What  
8 percentage of your consulting work has been for  
9 entities evaluating the economic feasibility of nuclear  
10 power?

11 A. Probably around forty percent over the years.

12 Q. Okay. Which nuclear facilities, in  
13 particular, have you dealt with?

14 A. Well, the four DOE loan guarantees. So,  
15 that's four facilities in Georgia, South Carolina,  
16 Maryland and Texas. I've assisted utilities in  
17 examining a number of different other facilities. For  
18 example, I worked for Exelon Corporation when they were  
19 looking at building a nuclear power plant in Texas.  
20 I've advised the Minister of Energy of Lithuania on a  
21 new nuclear project in Lithuania. I've done a lot of  
22 work in Canada looking at new nuclear, in Ontario,  
23 especially. I've looked at new nuclear in Japan, in  
24 the U.K., Germany, Italy, the United Emirates, Jordan,  
25 Saudi Arabia, Southeast Asia, Poland. So, a fair

1 amount of work in Scandinavia, especially Finland. So,  
2 a lot of different places.

3 Q. And with respect to limited to the United  
4 States, where we're dealing with the nuclear projects  
5 currently under construction. I believe you testified  
6 that there are four, to your knowledge, four units.

7 A. Well, there are five units. There's the TVA  
8 unit at Watts Bar, which is the continuation of  
9 construction that really started a very long time ago  
10 and, then, four-

11 Q. When did that start?

12 A. Sometime in the late 1980's or early 1990's.  
13 I don't know exactly.

14 Q. Before the ESP process was in place?

15 A. Yes. Yes, before the 10 C.F.R. Part 52  
16 process was created.

17 Q. Uh-huh [affirmative]. I didn't mean to  
18 interrupt you. Go ahead with the other.

19 A. Sure and, so, the four units or two plants  
20 currently moving forward, setting aside the TVA, are  
21 two units at Vogtle and Georgia and two at Summer in  
22 South Carolina.

23 Q. And, as part of your consulting or other  
24 duties, have you reviewed the financial profiles of  
25 those units being constructed?

1 A. Yes, I have.

2 Q. And were you involved with either of them,  
3 with either Summer or Vogtle, in the pre-ESP stages?

4 A. So, I supported the Department of Energy,  
5 Office of Loan Guaranty Programs, review of the loan  
6 guaranty application, which includes both financial  
7 projections for both of those projects, Vogtle and  
8 Summer. That's somewhat divorced from the regulatory  
9 interaction to get the early site permit and,  
10 ultimately, the-

11 Q. Approximately what year did that take place  
12 for-well, let's take them one-by-one-for Summer? When  
13 were you reviewing their federal loan guaranty  
14 applications?

15 A. Both of them were at approximately the same  
16 time, which was in 19-excuse me, 2007, 2008, somewhere  
17 in there.

18 Q. Have you been involved with either of those  
19 projects since that time?

20 A. No. I have not.

21 Q. As part of your testimony, you were describing  
22 Part 52, correct? And can we just refer to that as the  
23 ESP process, because I tend to mix-up 50 and 52. Is  
24 that accurate or is that-

25 A. Well, it's referring to the whole by one of

1 its pieces, but there's nothing wrong with it.

2 Q. Okay. Well, we can make it specific to Part  
3 52, if that's better, but you testified with respect to  
4 that part, that it has embedded optionality, in your  
5 words, because it allows you to bank the permit for 20  
6 years, plus an additional 20 upon application. Is that  
7 accurate?

8 A. Yes, that's accurate.

9 Q. And when we're talking about that part of Part  
10 52, are we talking about an ESP application? Let me  
11 re-phrase. Would an ESP application permit the  
12 applicant to bank it, essentially, for 20 years and re-  
13 apply for an additional 20?

14 A. Yes.

15 Q. And that is your understanding what Blue  
16 Castle is currently aiming to get, an ESP permit,  
17 correct?

18 A. Yes.

19 Q. Okay. You used the term nuclear renaissance,  
20 which I know is in the literature, to some extent, as  
21 well, correct?

22 A. That's correct.

23 Q. And I believe your testimony is that it's  
24 really happened overseas more than domestically. Is  
25 that accurate?

1 A. That's accurate.

2 Q. And is there an international corollary to the  
3 ESP internationally? Does it vary by country?

4 A. It varies by country. So, every country has  
5 its own approach.

6 Q. Okay. So, you, as part of this business  
7 model, the idea of being able to bank it or have off  
8 ramps, I think was a term that you used, the idea is  
9 that Blue Castle, should they be successful in getting  
10 an ESP, could hold onto that and the assets for up to  
11 40 years, correct?

12 A. In principle, that's right. I don't know  
13 exactly what they have in mind and, so, likely, a  
14 scenario for—yes.

15 Q. That is the advantage of the embedded  
16 optionality within the ESP, correct?

17 A. That's correct.

18 Q. It, essentially, allows you to hold on and  
19 wait to see how various economic factors might shake  
20 out, correct?

21 A. That's correct.

22 Q. And that's part of what de-risking this whole  
23 proposition means, in this case?

24 A. Yes, that's correct.

25 Q. As long as we're talking about risk, let's



1 talk about portfolio theory and you'll indulge me if I  
2 misspeak. I understand it's a very technical area.  
3 You submitted a report in this case prior to you  
4 testifying here today, correct?

5 A. Yes.

6 Q. And, in the discussion of a portfolio theory,  
7 do you recall you stated you have not calculated any of  
8 the parameters discussed below. Can you explain what  
9 you mean by the parameters?

10 A. Sure. So, I give an equation which defines  
11 portfolio risk and discuss what some of the factors are  
12 that contribute to that risk and, so-

13 Q. So, on direct-pardon me.

14 A. And, so, I didn't calculate what each of those  
15 individual parameters was in the case of the Blue  
16 Castle project.

17 Q. And, in fact, I think you also testified, on  
18 direct, that you haven't calculated the optimal mix of  
19 energy sources in a particular portfolio, correct?

20 A. That's correct and, in fact, it's not  
21 possible, in general, to do such a calculation because-

22 Q. Because it would have to be specific to a  
23 particular utility or whoever's portfolio you were  
24 forecasting?

25 A. That's correct. That's correct.

1 Q. In essence, basically, what we're saying is  
2 it's economically good not to be overly dependent on  
3 one or two types of power generation in the context of  
4 a portfolio analysis. Is that accurate?

5 A. That's correct.

6 Q. And it's better to have multiple types of  
7 power generation with various fuel needs and various  
8 emissions or waste impacts, correct?

9 A. That's correct.

10 Q. Let's refer you to what's been marked as  
11 Exhibit 68. Is it still up there?

12 THE COURT: No. I think Mr.—

13 MS. SWENSEN: This is the exhibit [inaudible]

14 THE COURT: I think Mr. Searle took it with him  
15 when he got off the bench.

16 MR. WRIGHT: Did you walk away with the evidence?

17 MR. SEARLE: Yes, I did.

18 MR. WRIGHT: See those stamps?

19 MS. SWENSEN: We can ask for all of those,  
20 actually.

21 MR. WRIGHT: Let's make sure we've got 71, 69, 70,  
22 68. They're all there.

23 [Inaudible discussion.]

24 MS. SWENSEN: Thanks, David.

25 A. Yes. I have Exhibit 68 right here.

1 Q. Okay. Have you reviewed this document before?

2 A. No, I have not.

3 Q. This was not a part of your analysis for this  
4 case, correct?

5 A. Correct. It was not.

6 Q. You heard testimony, earlier today, about the  
7 preferred portfolio contained within this document,  
8 correct?

9 A. Yes, I did.

10 Q. Are you familiar, at all, with the process by  
11 which an entity like PacifiCorp goes through  
12 constructing a preferred portfolio?

13 A. I am, in general, though it differs from one  
14 state to the next. So, the regulatory requirements,  
15 which drive integrated resource planning, differ from  
16 state to state.

17 Q. When you, in your testimony, described a  
18 portfolio analysis, is that the type of—the approach  
19 that we just discussed, not being overly dependent on  
20 one or two types and having various fuel needs, various  
21 waste impacts. Is that the type of thing that a  
22 utility takes into account in constructing their  
23 preferred portfolio?

24 A. They may, to some degree, but it's usually not  
25 an explicit portfolio theory, as I describe it. It is

1 not an explicit requirement in integrated resource  
2 planning.

3 Q. Could you turn to page 9, Arabic Number 9?

4 A. Yes.

5 Q. Do you see the bottom paragraph states  
6 PacifiCorp selected top performing portfolios on the  
7 basis of system costs using Monte Carlo simulations of  
8 each portfolio over a 20-year planning horizon. It  
9 states the Monte Carlo runs captured stochastic  
10 behavior of electricity prices, natural gas prices,  
11 loads, thermal availability and hydro availability.  
12 The relative average cost among portfolios and the  
13 upper tail cost among portfolios are used to evaluate  
14 cost and risk metrics among candidate portfolios and  
15 used to identify top performing resource portfolios  
16 that inform the company selection of the preferred  
17 portfolio.

18 A. Yes.

19 Q. Does that seem consistent with your  
20 description of portfolio analysis today?

21 A. No.

22 Q. Explain why not?

23 A. What's being described here is a Monte Carlo  
24 analysis, which is different from a portfolio analysis.

25 Q. Uh-huh [affirmative]. Can't a Monte Carlo

1 analysis be part of the input to a portfolio analysis?  
2 Isn't a-

3 A. So, the two can be used, to some degree,  
4 interchangeably. So, it's true that a utility or any  
5 asset, owner, operator, investor might choose to  
6 consider portfolio effects through an explicit  
7 portfolio model, which is the one I described in my  
8 report. They might also use a Monte Carlo simulation  
9 to consider what the right portfolio or mix of assets  
10 is, but those are different tools. You might use a  
11 yard stick or a tape measure. That might be similar,  
12 in some respects, but they also differ in some  
13 respects.

14 Q. And, yet, they would both yield a measurement,  
15 wouldn't they? A yardstick or a tape measure?

16 A. Well, they would, but they are used for  
17 different purposes.

18 Q. Uh-huh [affirmative]. Are you aware of a  
19 Monte Carlo analysis that's been done for Blue Castle?  
20 That wasn't anything you reviewed?

21 A. I reviewed this kind of cash flow analysis.

22 Q. I understand that but, specifically with  
23 respect to the Monte Carlo analysis?

24 A. I may have heard some reference to it, but  
25 it's not something I reviewed or relied upon.

1 Q. And not part of the basis for your opinions  
2 today?

3 A. Right.

4 Q. Fair enough. Looking at, again, in the  
5 preferred portfolio, on page 11 of the same exhibit,  
6 Exhibit 68 that we're dealing with, you see, in the  
7 table, that they have various resources listed,  
8 correct?

9 A. That's correct.

10 Q. Does it appear that they have diversified  
11 beyond one or two sources?

12 A. It would so seem.

13 Q. Did you calculate the net present value of the  
14 proposed nuclear plant with or without the embedded  
15 option?

16 A. I didn't replicate the calculation that Blue  
17 Castle performed.

18 Q. That was what Blue Castle performed and  
19 provided to you?

20 A. That's correct.

21 Q. Is it part of your conclusion that the project  
22 is economically viable?

23 A. It is my opinion that it's economically  
24 feasible.

25 Q. But is that conclusion based, in part, on the

1 net present value calculations done by Blue Castle?

2 A. That would form one part of my opinion, sure.

3 Q. It does. So, if there was a problem with  
4 that, then, it's a problem with your opinion?

5 A. No. I don't think that's a logical  
6 conclusion.

7 Q. If there are problems to the underpinnings to  
8 your opinion, you don't consider that problematic?

9 A. I said it's one of the underpinnings in my  
10 opinion.

11 Q. It's one of the influence. There might be  
12 other bases that could support your same conclusion?

13 A. A variety.

14 Q. Of course. So, let's look at Exhibit 60 in  
15 your binder.

16 A. Six zero?

17 Q. Six zero, thank you. I have just a very  
18 simple preliminary question. You testified about this  
19 exhibit on your direct, correct?

20 A. I did.

21 Q. And this is not—so I understand, this is not  
22 something that you created. It's something that you  
23 reviewed to make sure that the general assumptions  
24 included were consistent with your understanding of the  
25 industry, correct?

1 A. That's correct.

2 Q. What does EPNM stand for?

3 A. Where am I looking?

4 Q. Second line from the top, Blue Castle project  
5 EPNM valuation.

6 A. I don't know what EPNM stands for.

7 Q. Okay. Is it fair to say that this is,  
8 essentially, a discounted cash flow analysis?

9 A. Yes.

10 Q. Okay and, as such, it's essentially looking  
11 at—and, again, correct me if I'm wrong, but you're  
12 looking at, essentially, the present value of the  
13 revenue streams that could be expected once the plant  
14 is in operation. Is that accurate?

15 A. That's accurate.

16 Q. So, a basic assumption is that this table  
17 starts at the time that the plant begins operating,  
18 which I understand is an approximation and could vary  
19 in the exact date.

20 A. That's correct.

21 Q. That's the assumption of the table?

22 A. Yes.

23 Q. So, in this discounted cash flow analysis,  
24 does it include any of the costs that preceded  
25 operation? Cost of construction, for example?



1           A. So, there would be a line item and, in fact,  
2 there is. Interest on total debt reflects the debt  
3 service on the capital investment required to build the  
4 plant. So, yes. It is reflected here.

5           Q. So, you're testifying that the line for-I just  
6 lost it. The interest on total debt, that the note  
7 indicates is the initial long-term debt and debt due to  
8 capital cost during outages?

9           A. Yes.

10          Q. Have you broken down what portion of that  
11 reflects the cost of construction?

12          A. No. I would anticipate it would be the vast  
13 majority of that number.

14          Q. But did you compare that number to your  
15 awareness of the cost of construction in the other  
16 projects which you've been involved with?

17          A. This debt service for a dual unit nuclear  
18 plant is of the same rough order of magnitude as many  
19 others I've seen. It's based on an assumption of  
20 building the capacity that they plan to build and  
21 financing it through debt and paying off the debt over  
22 a lengthy period of time and this kind of debt service  
23 is fairly typical for a dual unit nuclear plant.

24          Q. So, this debt service, when you say, this is  
25 the amount that they anticipate taking out in loans?

1           A. It's—so, yes. This would be loans. That is  
2 financing for loans.

3           Q. So, is it Blue Castle's—as you understand it,  
4 is it Blue Castle's business plan to finance the entire  
5 construction through loans?

6           A. I don't know what debt to equity ratio is  
7 built-in here, but in the business—

8           Q. Wouldn't that be something that you would want  
9 to evaluate for the economic viability of the project,  
10 the debt to equity ratio?

11          A. That is not really a dispositive factor in  
12 whether something is economically viable.

13          Q. I didn't ask whether it was dispositive.  
14 Isn't that a relevant factor, really?

15          A. I don't think, for determining whether a  
16 project is financially attractive, determining, up  
17 front, what portion of it will be debt versus equity is  
18 an important factor.

19          Q. Well, that's changing the question a little  
20 bit. Are you only assessing whether it might be  
21 attractive or whether it's, in fact, economically  
22 feasible? Are you equating the two?

23          A. I don't think there's a significant  
24 difference, conceptually, between might be attractive  
25 under a range of scenarios and financially feasible or

1 economically feasible.

2 Q. So, when you—if you took the line items, here,  
3 for each of the years that we have in question, and it  
4 looks like we have two, three, four, five, six years,  
5 correct?

6 A. On this page and, then, it continues out on  
7 the following pages to the end of the calculation,  
8 which you see it goes through 2083.

9 Q. Which is through the life of the—uh-huh  
10 [affirmative].

11 A. So, a sixty year life.

12 Q. And pardon me just one moment. So, you would  
13 expect, then—I don't think I still understood whether  
14 there's an answer whether you would expect that the  
15 entire cost of construction is bound-up in the debt  
16 expected to be incurred or not.

17 A. I would expect it, the way they've constructed  
18 this spreadsheet, I would anticipate it's all included  
19 here.

20 Q. That if we totaled-up all of the interest on  
21 total debt, that that would capture the total capital  
22 expended in getting the plant to operation?

23 A. It would. The major alter—

24 Q. Isn't that just the interest?

25 MR. WRIGHT: Your Honor, can he finish his answer?

1 THE COURT: Yeah. You're cutting him off. So,  
2 let him finish his answer.

3 Q. I'm sorry. I apologize, Dr. George.

4 A. So, your debt service would include the  
5 principal and interest payments. So, it's like a  
6 mortgage. If they were anticipating significant  
7 equity, you would expect to see a line for equity  
8 returns as well. I don't see that line. So, I think,  
9 for purposes of this projection, they assumed pure debt  
10 and, then, yes. In that instance, summing-up the  
11 interest on debt would sum-up to the capital cost.

12 Q. Okay and just so I understand, when you say  
13 that there's no expectation of equity, explain what you  
14 mean by that in the context of this, obviously.

15 A. Sure. In financing a new project of any sort,  
16 there are two sources of capital. One is equity. So,  
17 that's money out of your own checkbook, and the other  
18 is debt, which is money you borrow from a bank or from  
19 lenders through the capital markets or through some  
20 other mechanism and, usually, there will be a mix or  
21 some blend between the two, but it really depends on  
22 the project and many projects that are built, power  
23 plant projects, are almost debt and some have varying  
24 degrees of equity, up to forty or even fifty percent  
25 equity and, so, in constructing a cash flow projection,

1 you would include, depending on what the capital  
2 structure is; that is, how much debt and how much  
3 equity, you would have a line item for repayment to  
4 debt and repayment to equity, which is the basis of my  
5 answer to that.

6 It's not really a significant factor. You just  
7 need to include it in your model. You're paying back  
8 either your lenders or your owners but, either way, you  
9 just include a line item in your projection and, here,  
10 the line item that I see is interest on total debt.

11 Q. Uh-huh [affirmative]. I think I understand a  
12 bit better now and, so, when you said that it was—your  
13 testimony is it's not unusual to not include a line  
14 item, for example, for equity if it's being financed  
15 entirely through debt. That would be consistent with  
16 the practices with which you're familiar, correct?

17 A. Yes.

18 Q. And I think that my question that I tried to  
19 pose earlier and, probably, did not very artfully, but  
20 was it a part of your evaluation, part of your analysis  
21 to consider the amount of debt, basically, that Blue  
22 Castle was considering taking on relative to its  
23 overall assets?

24 A. No. That's not part of the evaluation and, in  
25 fact, it's my opinion that, again, the capital

1 structure of a project is not an important element in  
2 judging the economic viability or feasibility of that  
3 project. I've seen successful projects financed with  
4 almost purely debt, with almost pure equity, or some  
5 blend.

6 Q. Uh-huh [affirmative]. Okay. So, did you, as  
7 part of your analysis, apart from the discounted cash  
8 flow analysis, did you review any account of Blue  
9 Castle's available assets and financial profile?

10 A. I did not.

11 Q. Did you consider the effect of advance cost  
12 recovery statutes on any of the nuclear plant projects  
13 that you've evaluated?

14 A. I did. That's, certainly, part of the  
15 analysis.

16 Q. And there isn't any such legislation that you  
17 were asked to assume applicable to this case, correct?

18 A. That's correct.

19 Q. Did Vogtle have advance cost recovery in  
20 place?

21 A. It did.

22 Q. Did Summer?

23 A. It did.

24 Q. And do you think that those were factors in  
25 their being developed?

1           A. I think the important factor for Vogtle and  
2 Summer was that they were developed within rate base.  
3 Really, the dividing line, as I see it, in financing  
4 nuclear plants is are you in a jurisdiction where  
5 generation is part of the regulated vertically  
6 integrated utility or is it not? Is it in some kind of  
7 merchant power or re-structured, liberalized, reformed  
8 market structure?

9           Thirty-two states, including Utah, fall into the  
10 former and 18 states fall into the latter category;  
11 that is, they have some kind of market reform which  
12 pulls generation out of rate base. I think nuclear is  
13 eminently financeable anywhere generation can be within  
14 rate base. I think it's a little more challenging when  
15 it's not in rate base, when it's in one of these 18  
16 states that have liberalized the market. I don't think  
17 the key factor is whether there is advanced recovery of  
18 construction cost or not.

19           Q. But that was present in both the Summer and  
20 the Vogtle sites under construction, correct?

21           A. Yes.

22           Q. Did the entities, to your knowledge, did the  
23 entities building Vogtle take advantage of the federal  
24 loan guaranties, promotion tax credits and other  
25 benefits under the Energy Policy Act of 2005?

1           A. They applied for, and were selected for, a  
2 loan guaranty, but have not, today, closed on that loan  
3 guaranty.

4           Q. And how about Summer?

5           A. They haven't gotten as far along in the  
6 process. In fact, it's very unlikely they'll make use  
7 of the loan guarantee.

8           Q. Currently, there are no such benefits  
9 available to Blue Castle, right?

10          A. That's correct, but that's not a negative  
11 factor, I would say, given the mixed reaction, in the  
12 end, the loan guaranty program had in the nuclear  
13 sector.

14          Q. Regardless, it's an option that was available  
15 to the four units newly under construction that is not  
16 available to Blue Castle, correct?

17          A. That's correct.

18          Q. Did you, in your analysis for this case, did  
19 you consider the average financial profile of the  
20 owners or operators of the existing nuclear plants?

21          A. No, I didn't.

22          Q. I think that's consistent with what you just  
23 testified, that that isn't, necessarily, relevant to  
24 your analysis.

25          A. It's not only irrelevant to the analysis, it's



1 also unknowable, right now, and it's inconsistent with  
2 an optionality-based business model. Blue Castle is  
3 not a utility. It's not going to spend \$12 million  
4 tomorrow, or whatever the number is, to build a new  
5 nuclear plant.

6 Q. How long has the embedded optionality been  
7 available that's under Part 52?

8 A. I'm sorry. I don't understand the question.

9 Q. How long has it been possible—when was an ESP  
10 first an option?

11 A. Well, 10 C.F.R. Part 52 was enacted somewhere  
12 in the mid-1990's.

13 Q. Uh-huh [affirmative] and, under that, I think  
14 we've heard testimony that there have been exactly four  
15 ESP's granted. Is that consistent with your  
16 understanding?

17 A. I don't know the number.

18 Q. Okay. Consistent with—well, let me just ask  
19 it bluntly. You've concluded, in your report, that  
20 Blue Castle Holdings may continue to be a long-term  
21 partner of the project, correct?

22 A. That's correct.

23 Q. Do you also envision a scenario where Blue  
24 Castle would not retain any ownership interest in the  
25 project?

1 A. That's, certainly, conceivable.

2 Q. And it's consistent, in fact, with what you  
3 just explained to me about the discounted cash flow  
4 analysis, correct?

5 A. It's hard to say whether they would exclude an  
6 equity line because they don't retain ownership or for  
7 some other reason.

8 Q. Okay. Are you aware of the average financial  
9 profile of the owners and operators of existing nuclear  
10 plants?

11 A. I am, certainly, in general terms.

12 Q. In general terms, they are all large utilities  
13 or consortiums of utilities, aren't they?

14 A. That would be the typical profile, sure.

15 Q. And, if we were to do the comparison of their  
16 cash from operations and their asset base to Blue  
17 Castle's, it would not be comparable, correct?

18 A. It's not comparable, but it's an unreasonable  
19 comparison. Blue Castle doesn't intend to be the  
20 owner-operator of the plant.

21 Q. But for any of those—but what Blue Castle is  
22 proposing is taking it through at least the de-risking  
23 phase up through an ESP, correct?

24 A. Correct.

25 Q. For all of the entities currently operating

1 with an ESP, didn't they go through the same process?

2 A. Well, they did, but that doesn't mean they  
3 have the same business model. The ones that have gone  
4 through the process elsewhere have, typically, been  
5 major utilities that have done this as the first step  
6 of many along the way toward developing new nuclear.

7 Q. Have you, personally, in your experience in  
8 the United States, dealt with any situation where there  
9 was a non-utility entity who proposed obtaining a  
10 permit and, then, selling some or all of the interest  
11 to interested utilities?

12 A. I have dealt with a few companies of that  
13 sort.

14 Q. What nuclear plants did they end up building?

15 A. So far, none.

16 Q. Okay. Let's talk about natural gas prices for  
17 a little bit, which I think the overall—you stated  
18 there are two key factors. One is they are  
19 unpredictable and, two, that there's market anomalies,  
20 correct?

21 A. That's correct.

22 Q. But you admit that natural gas is, currently,  
23 the least expensive fossil fuel, right?

24 A. That's correct.

25 Q. And at current prices, it is the most

1 competitive fuel for new generation capacity, right?

2 A. If you assume they stay where they are, that's  
3 correct.

4 Q. Current prices. That's my assumption. You  
5 discussed, in your direct and in your report, the  
6 possibility of shale gas production and increases in  
7 exports as potentially increasing or, we can say, at  
8 least changing the future price of natural gas,  
9 correct?

10 A. Yes.

11 Q. Your exact wording in the report, and I'm  
12 going to it because I just want to know what, exactly,  
13 you're going to say today, is neither of these  
14 contingencies can be deemed unlikely, in the mid to  
15 long-term. Translate the double negative for me. Are  
16 you saying it's likely that they will increase or just  
17 that it's unknown?

18 A. I'd say it's unknown. We don't know.

19 Q. Okay. You cite a special comment from Moody's  
20 in support of the uncertainty of future gas prices,  
21 right?

22 A. Yes.

23 Q. Do you recall the date, approximately, of that  
24 article?

25 A. I don't, offhand.

1 Q. I'm handing you what's been marked as Exhibit  
2 72. Does this appear to be a copy of the Moody's  
3 Special Comment on New Nuclear Generating Capacity to  
4 which you referred?

5 A. Yes.

6 Q. And does the date at the top, May 2008,  
7 refresh your recollection?

8 A. Yes.

9 Q. Does this article make any projection of  
10 future gas prices?

11 A. No. I don't believe so. I would need to read  
12 through to see if they do and, in fact, of course, in  
13 2008, natural gas prices are very different from what  
14 they are now.

15 Q. Certainly. This article also doesn't analyze  
16 the likelihood of shale gas production continuing, does  
17 it?

18 A. Yeah, it doesn't.

19 Q. Nor the export of natural gas increasing?

20 A. It does not.

21 Q. You are citing it more just for the general  
22 uncertainty?

23 A. Yes.

24 Q. Is that accurate?

25 A. Yes.

1 Q. This article also states that new nuclear is  
2 very costly, potentially over \$7,000 per kilowatt. Did  
3 you consider that cost figure in your analysis?

4 A. Certainly. It's part of the range of capital  
5 costs that I consider in my analysis, here and  
6 elsewhere. I think it's an outlier on the upper end.  
7 I think a much more reasonable range is significantly  
8 lower than that.

9 Q. In your experience, does that cost, the \$7,000  
10 per kilowatt cited by Moody's here, how does that  
11 compare to the cost per kilowatt of new scrubbed coal-  
12 fired plants?

13 A. It's, certainly, significantly higher.

14 Q. Would you disagree with Moody's assessment of  
15 it's twice as much?

16 A. I would not.

17 Q. And how would it compare to new, combined  
18 cycle natural gas plants?

19 A. Even more costly.

20 Q. As much as three times as much, according to  
21 Moody's. Is that accurate?

22 A. That's accurate.

23 Q. You wrote, in your report, that the apparent-  
24 and I believe it's consistent with what we've been  
25 discussing, that the apparent economic advantage of

1 gas-fired generation may be short lived and, as I  
2 understand your opinion, to the uncertainty about  
3 future prices, correct?

4 A. That's correct.

5 Q. Isn't it economically rational to use gas now,  
6 while it's cheap, and allow time for alternatives to  
7 develop?

8 A. No. It would be really irrational to do that  
9 because you're building very long-lived assets and you  
10 need to have a view about the cost of fuel over a very  
11 lengthy period of time and, so, it's not rational to  
12 build something, now, because the fuel is very cheap if  
13 you think there's a reasonable expectation it might be  
14 considerably more expensive going forward.

15 Q. So, you wouldn't include it as an option, at  
16 all, in a portfolio?

17 A. Oh, sure. I would include it as an option in  
18 a portfolio, of course. Would I have ninety-eight and  
19 a half percent of my generation be fossil fueled? I  
20 don't think so.

21 Q. Okay. You have dismissed the ability of  
22 alternative or clean energy technologies to compete  
23 with nuclear, in part, because of their high costs and  
24 relatively low capacity or availability, right?

25 A. I think I would take issue with the use of the

1 word dismissed. I don't dismiss them at all. I think  
2 they need to be part of the portfolio.

3 Q. But, in terms of their ability to compete with  
4 nuclear, picking one over the other, those are  
5 disadvantages that you cite?

6 A. I, certainly, cite those disadvantages, sure.

7 Q. Did you consider the evidence that renewable  
8 technologies are still experiencing significant  
9 advances in efficiency and cost reduction?

10 A. That's a really interesting question and it,  
11 really, points to, I think, a key issue in this case  
12 and it's the critics of nuclear completely dismiss the  
13 possibility of learning curve effects in nuclear, that  
14 the cost, for example, as we learned from the  
15 experience of building a nuclear in China, that the  
16 cost will come down, as it has in virtually every  
17 technology, over time. Yet, the critics believe that  
18 that learning effect will be really strong in every  
19 other alternative to nuclear and I think one needs to  
20 be realistic and skeptical for all technologies. I  
21 think that's an important attitude to have, but I think  
22 it's really inconsistent to view it present for  
23 renewable, but not present for nuclear.

24 Q. I agree. I think that it's reasonable to say  
25 that there is a learning curve for each technology and,



1 particularly, let's say evolving technologies, but  
2 along with those lines, have you done any comparison to  
3 see if the cost of the nuclear construction has  
4 decreased over time?

5 A. I have and, in places where nuclear plants are  
6 being built, like China, the cost has come down.

7 Q. Hm. Does China have any significant  
8 differences like, maybe, state-sponsored building of  
9 the nuclear plants?

10 A. Sure.

11 Q. In the U.S., have you seen any evidence that  
12 the cost of construction for new nuclear has gone down?

13 A. We have two projects ongoing, right now, they  
14 are in the process of building. I don't think we know  
15 yet. We don't have the data to know whether the cost  
16 will go down, over time, or not.

17 Q. Sir, are you familiar, then, with the  
18 construction costs in Vogtle? That's one of the two  
19 you just referenced, right?

20 A. Yes.

21 Q. Have they stayed on budget?

22 A. No.

23 Q. In fact, haven't they already had at least one  
24 lawsuit brought about the cost overruns?

25 A. So I understand.

1 Q. How much are they over budget?

2 A. I don't know the latest number.

3 Q. Hundreds of millions?

4 A. Something in that order.

5 Q. So, when you say that recent experience  
6 suggests a leveling-off of overnight capital costs, is  
7 that consistent with Vogtle?

8 A. Estimates. So, there's been a leveling-off of  
9 estimates.

10 Q. Ah.

11 A. We don't know what the actual, in the end,  
12 what the capital cost will end up being for Vogtle or  
13 Summer.

14 Q. That's a very good distinction. So, you're  
15 saying that the estimates continue to level off, while  
16 the actuals may still be running hundreds of millions  
17 over?

18 A. It's important to emphasize Vogtle and Summer  
19 are first of a kind, right? They're running at  
20 parallel. The nuclear sector, in many respects, is  
21 waiting to see what happens with those and, so, the  
22 nuclear renaissance isn't as much dead. It's just on  
23 hold as the sector waits to see how the events unfold  
24 in South Carolina and Georgia.

25 Q. Are you aware of statements by the Georgia

1 PSC, recently, about the cost overruns with Vogtle?

2 A. No, I'm not.

3 Q. You mentioned China. Is Blue Castle modeling  
4 its business plan after the Chinese approach the  
5 nuclear construction in any way?

6 A. Certainly not explicitly. I don't think  
7 there's an assumption that, you know, for example, we  
8 would suspend the rule of law in Utah since China lacks  
9 the rule of law. I mean, there are significant  
10 differences.

11 Q. That's a pretty big difference, yeah.

12 A. That would be a big difference. So, I mean, I  
13 think it's important to emphasize, I think, Blue  
14 Castle, as am I, we're very sensitive to significant  
15 differences between China and the United States.  
16 Nonetheless, the technology is the same. An AP1000  
17 being built in China is, basically, the same as an  
18 AP1000 being built in Georgia or South Carolina and,  
19 so, as the learning curve effects are realized in  
20 China, so, too, we would expect to see those learning  
21 curve effects be realized in the United States.

22 Q. But you would not expect the economics to be  
23 comparable given one is a state subsidized construction  
24 and one is private, correct?

25 A. Certainly, the overall economic model is very

1 different. The profit model, the political, legal  
2 regulatory underpinnings, labor issues, they are all,  
3 obviously, very different but, on the one really key  
4 issue, one of the driving factors is—and one of the  
5 refrains, I think, of people who oppose new nuclear  
6 construction is the unknown or ever-increasing capital  
7 cost, meaning a disbelief in a learning curve effect.  
8 I think, in that particular very critical issue, I do  
9 think China is a very good model and place for us to  
10 consider the learning curve effects for new nuclear  
11 that I'm fairly confident we will see in the United  
12 States.

13 Q. So, when you say the learning curve effects in  
14 China that would be applicable here, again, we're  
15 talking about the economics of it? That's your opinion  
16 focus today, right? Is on the economic and financial  
17 feasibility of the project?

18 A. Yes, but a key ingredient in the economics is  
19 the up-front capital costs, the construction costs as  
20 you learn to stage materials better, to do construction  
21 to the top of the containment, to plan your work  
22 better, to have a bigger set of more competitive  
23 suppliers for your parts and components and systems.  
24 Those things contribute to learning curve and to lower  
25 costs, capital costs, for the same technology built

1 elsewhere.

2 Q. Is it your testimony, today, that China has a  
3 more competitive market when it comes to the vendors  
4 for construction?

5 A. I don't know that I would say it has a more  
6 competitive market than the United States. I do know  
7 more nuclear plants are being built in China and, so,  
8 the vendor base is, probably, larger and more diverse  
9 than the United States and, certainly, when we build  
10 the same design plant that is being built in China, we  
11 can also make use of the, again, the learning curve  
12 effects, the lower costs that come from the serial  
13 production of these components in China.

14 Q. Perhaps, before we go further down the road of  
15 the China comparison, have you presented, today, or in  
16 your report any data about a leveling-off of costs  
17 based on the China experience?

18 A. No, not explicitly the China experience, but I  
19 do think the learning curve effect is an important  
20 ingredient. I mean, when-

21 Q. Have you presented any data about the learning  
22 curve effect in China?

23 A. In this report, no.

24 Q. In your testimony today, have you?

25 A. No, other than what I've just described

1 orally.

2 Q. I'm asking for any quantification of the  
3 learning curve effect and its decrease in the cost you  
4 could expect with a nuclear project.

5 A. No, I have not.

6 Q. Okay. Does China have the same safety  
7 standards that the U.S. does with respect to nuclear  
8 facilities, their construction and operation?

9 A. I think they have the same goals that the U.S.  
10 has, but they've got a different regulatory regime and  
11 a different approach.

12 Q. You have a reference to—you've made reference  
13 today to a levelized cost analysis, correct?

14 A. Yes.

15 Q. Did you, personally, do a levelized cost  
16 analysis in this case?

17 A. I have plugged these parameters into my  
18 levelized cost model to judge the reasonableness, yes.

19 Q. Have you disclosed the results of your  
20 levelized cost model?

21 A. In my report, for example, I say, using the  
22 capital cost from the EIA, that new nuclear has a  
23 levelized cost of eight to twelve cents per kilowatt  
24 hour. That's the result of my own work with my  
25 levelized cost model that I've done for a variety of

1 clients over the past several years.

2 Q. Does that incorporate all costs, as we've  
3 discussed before, the difference between the cost of  
4 overnight capital costs, the construction permitting,  
5 licensing, or is this just production costs.

6 A. It includes everything, but it covers a really  
7 wide range because there's a wide range of reasonable  
8 assumptions.

9 Q. Did you take into account the value of the  
10 water being consumed?

11 A. It's included only—it is included, but it's  
12 included, indirectly, through the O&M cost, the typical  
13 nuclear O&M cost, which is part of the model.

14 Q. So, in other words—just trying to clarify  
15 here—the amount that they actually paid for the water,  
16 not any assessment of what the water could have been  
17 sold for, for other purposes, or anything like that,  
18 correct?

19 A. It reflects the typical price of water, which  
20 is one of many components in O&M cost for nuclear  
21 pricing.

22 Q. As paid by nuclear plants anywhere in the  
23 country, correct?

24 A. That's correct.

25 Q. I know you claimed, in your report, that you

1 had seen no early retirement of nuclear plants, but I  
2 believe you testified, right off the bat this morning—  
3 or, this afternoon, pardon me, that, in fact, you are  
4 aware of several retirements, correct?

5 A. Yes.

6 Q. And, in fact, five reactors have closed, so  
7 far, in 2013, correct?

8 A. That's correct.

9 Q. It stated, in your report, that, in your  
10 opinion, virtually all U.S. nuclear reactors would  
11 receive a license extension. Do you see any reason to  
12 amend that statement as you sit here today?

13 A. No.

14 Q. The fact that five have closed doesn't change  
15 it?

16 A. Well, some that have closed had license  
17 extensions.

18 Q. Uh-huh [affirmative]. So, the license  
19 extension isn't, in itself, a very good gauge of  
20 whether or not the plan continues operating?

21 A. It's not a gauge of whether, in fact, it  
22 continues to operate. It, certainly, is a good gauge  
23 of whether the owner-operator thinks it should continue  
24 to operate. Otherwise, the owner-operator would not  
25 invest in the licensing.



1 Q. Are you aware, also, of cancelled construction  
2 plans for nuclear plants in the last year?

3 A. Sure. There have been several.

4 Q. Do you—but that doesn't affect your opinion  
5 that nuclear power is economically viable, correct?

6 A. That's correct.

7 Q. So, while you opined that license extensions  
8 and power upgrades are strong evidence of economic  
9 viability, as I think I understand your testimony, you  
10 would not say that decommissioned and cancelled  
11 construction plans are evidence of the lack of economic  
12 viability. Is that accurate?

13 A. I think decommissions, they are unique  
14 situations. Each one is special unto itself. I think  
15 cancelled plants, I think, they warrant additional  
16 consideration. They, certainly, reflect the  
17 perception, on the part of some utilities in some  
18 places, that they would prefer, for the moment, not to  
19 build the nuclear plant that they had announced they  
20 were considering and that can reflect a whole range of  
21 things, but it might include the fact that they already  
22 have a lot of nuclear plants. They don't need to  
23 diversify their portfolio further in that state or  
24 region through nuclear.

25 Q. One of the specifics that I know you mentioned

1 you had dealt with was Exelon in Texas, correct?

2 A. Yes.

3 Q. And you're aware that they recently cancelled  
4 their plans for developing a new nuclear facility,  
5 correct?

6 A. That's correct.

7 Q. And they already had an application pending.  
8 Is that accurate?

9 A. I believe so, yes.

10 Q. And are you aware of the reason they cited for  
11 withdrawing their application?

12 A. I believe they cited economic viability.  
13 They've been—I think Exelon has been pretty vocal that  
14 they believe a low natural gas price is a major issue  
15 for building new nuclear right now.

16 Q. Your opinion related to sufficient demand is  
17 based, largely, on various projections of population  
18 growth and the assumed related increases in energy  
19 demand, correct?

20 A. That's correct.

21 Q. And in your opinion that there is sufficient  
22 growth and demand in Utah justifying the Blue Castle  
23 project, did you take into account any ongoing projects  
24 by utilities in Utah, or the region, to increase their  
25 energy generation capabilities?

1           A. Certainly, in general terms, yes, but not at  
2 the level of the IRP discussion that we heard this  
3 morning, for example.

4           Q. Explain to me a bit more. When you say in  
5 general terms, you took it into account, what do you  
6 mean?

7           A. Sure, that the notion that utilities owning  
8 generation in Utah can consider different, new sources  
9 of generation, including new coal, renewables and  
10 nuclear, among others, as well as natural gas and, so,  
11 my opinion is based on, in my view, that it would—first  
12 of all, there's no real credible opportunity for new  
13 coal in Utah or, frankly, anywhere in the U.S.; that  
14 coal alternatives, with carbon capture and  
15 sequestration are, as far as I can tell, dead on  
16 arrival in terms of the market; and that renewables are  
17 quite limited in the degree to which they can be  
18 deployed in Utah. We heard, this morning, about the  
19 limitations on wind as a resource in Utah and, of  
20 course, solar is very, very costly right now.

21           Q. But let's take that bit-by-bit. Well,  
22 actually, I think we can take it larger, but your  
23 initial answer was but you didn't look at it to the  
24 level of what are utilities in Utah and the region  
25 specifically developing, correct?

1           A. Correct. I didn't at the level of individual  
2 plants, which I think we heard about at considerable  
3 length this morning—

4           Q. Correct.

5           A. -particular retirements and particular new  
6 projects, no.

7           Q. Nor did you analyze the effect of existing  
8 conservation programs that are in effect in the region,  
9 did you?

10          A. Well, certainly, conservation forms a back-  
11 drop to my opinions. There's no doubt that  
12 conversation can play a role, demand-side management,  
13 energy efficiency, but these are at the margin. You're  
14 talking a few percentage points of the entire load.

15          Q. But, so, that's my question. Did you actually  
16 quantify or use other people's quantifications of the  
17 effects of these ongoing alternatives and conservation  
18 demand-side management programs would have on demand?

19          A. Did I run a model? No. Do I strongly have  
20 the opinion that conservation will not be sufficient to  
21 meet the demands of the power in Utah, with a doubling  
22 population through 2050, I strongly have that opinion.

23          Q. Certainly not by itself. I think no one has  
24 testified as to that, but I'm talking about in the  
25 context of your portfolio analysis. You did not, for

1 example, I think you testified that you did not examine  
2 the preferred portfolio put forth by PacifiCorp in its  
3 most recent IRP, which shows a mix of these, among  
4 other, options, correct?

5 A. That's correct. Did not review the IRP's.

6 Q. All right. I think you put it well. You  
7 testified, earlier, that, possibly, a theme today could  
8 be uncertainty, correct?

9 A. That's correct.

10 Q. And, along those lines, just so we're clear on  
11 the scope of your opinions, you are not opining, today,  
12 on the likelihood of whether this project will be  
13 approved, licensed or built in the future, are you?

14 A. That's correct.

15 Q. And, in fact, the Moody's article that we  
16 discussed, the comment that we discussed, earlier,  
17 acknowledges that, given the long time frame for  
18 construction, new market and technology risks might  
19 render a new nuclear plant uneconomic over the course  
20 of construction, correct?

21 A. There is no doubt that rational investors can  
22 look at nuclear. They can look at any other generation  
23 technology and, based on their degree of risk aversion,  
24 their existing portfolio, their preferences for  
25 different kinds of generation fuels, that they could

1 conclude, reasonably, that any of these is not  
2 economical for them, in their portfolio. There's no  
3 doubt about that.

4 Q. Okay.

5 MS. SWENSEN: I think that's all I have. Thank  
6 you, Dr. George.

7 THE COURT: Ms. Valdes, any questions?

8 MS. VALDES: No questions. Thank you, Your Honor.

9 THE COURT: Re-direct, Mr. Wright?

10 MR. WRIGHT: Yes, Your Honor, briefly.

11 RE-DIRECT EXAMINATION

12 BY MR. WRIGHT:

13 Q. Dr. George, you were asked about loan  
14 guaranties, federal loan guaranties, in connection with  
15 the Vogtle and Summer plants, in particular, I think.

16 A. Yes.

17 Q. Would those be considered subsidies or forms  
18 of subsidies?

19 A. Well, I think the general answer is yes.  
20 People view them as subsidies, but I will tell you that  
21 the utilities, themselves, once they saw the fine print  
22 and the strings attached and the terms and conditions,  
23 they viewed them not as subsidies, but as burdens. So,  
24 South Carolina Electric and Gas walked away or,  
25 basically, has walked away.

1 Q. I was going to ask you that very next  
2 question.

3 A. Yes and George Power, [inaudible], has not  
4 closed on the loan guaranty.

5 Q. All right and what are the strings attached  
6 that come with those loan guaranties that caused South  
7 Carolina to say no thanks?

8 A. Well, it would be hard to point to a  
9 particular one, but a variety of strings were attached.  
10 One is the need to pay a significant fee, up front.  
11 So, there's a big ante, a very costly payment to keep  
12 open the option. This is, again, optionality, but it's  
13 very costly to keep the option of a loan guaranty open.  
14 The cost of capital isn't a lot cheaper than the  
15 really low cost of capital that's out in the markets  
16 right now.

17 Q. Is that because interest rates are so low?

18 A. Interest rates are very low. You can go and  
19 finance these plants from the market very  
20 inexpensively. So, the need for government financing  
21 is low. Plus, there's a requirement for parental  
22 guaranties and all sorts of legal and other strings  
23 that the utilities find distasteful.

24 Q. In terms of other sources of fuel—of power,  
25 I'm sorry, what other kinds of subsidies have the

1 alternatives, for example, enjoyed in this country?

2 A. Well, I think, there, the case that the  
3 government programs or subsidies is actually a lot  
4 stronger because they, significantly, reduce the cost  
5 to the investor and the consumer of the technology.  
6 So, wind and solar, for example, they exist, almost  
7 solely, due to subsidies, about a third of the cost,  
8 the installed cost, for wind and solar is from explicit  
9 government either investment tax credits or production  
10 tax credits. So, just a really massive subsidy, plus  
11 the requirement that they be part of so-called  
12 renewable portfolio standards and, in direct, but  
13 nonetheless very real and costly subsidy.

14 Q. What about other established forms, any of the  
15 fossil fuels, either indirect or direct subsidies,  
16 price supports, that sort of thing?

17 A. Sure. There's no doubt that, if you define  
18 subsidy broadly enough, a lot of technologies are  
19 subsidized to a very high degree or have been over  
20 time. Certainly, the petroleum industry has been the  
21 beneficiary of a lot of either direct or, maybe, more  
22 frequently in recent decades, indirect subsidies to  
23 keep open shipping lanes in the Middle East and things  
24 of that sort. These are very costly undertakings for  
25 public policy which a reasonable observer could say is



1 a form of indirect subsidy.

2 Q. And when Blue Castle retained you to evaluate  
3 its proposals and look at its assumptions in its model  
4 and provide an opinion here, today, did we ask you to  
5 opine as to the feasibility of a nuclear project in  
6 Utah to the exclusion of all other possible sources of  
7 electricity, new electricity?

8 A. By no means. I mean, implicit in my requested  
9 testimony and, I think, in the Blue Castle business  
10 model is that nuclear would be one element of a diverse  
11 portfolio going forward.

12 Q. And you're not here to opine that, say, a new  
13 natural gas plant is not economically feasible?

14 A. The notion of economic feasibility is non-  
15 exclusive. That is to say, once you consider the need,  
16 the really strong economic imperative to have a diverse  
17 portfolio, that the economic feasibility which is the  
18 best is the need to have several in the portfolio. So,  
19 by no means in saying that nuclear is feasible in Utah,  
20 according to the Blue Castle business model, that, by  
21 no means, excludes anything else. In fact, it embeds,  
22 within it, the assumption that it would be part of a  
23 very broad, diverse portfolio.

24 Q. Okay, thank you. Nothing further.

25 THE COURT: Re-cross on those items?

1 MS. SWENSEN: One re-cross. One quick question,  
2 Dr. George.

3 RE-CROSS-EXAMINATION

4 BY MS. SWENSEN:

5 Q. What you just testified, that economic  
6 feasibility is a non-exclusive statement, essentially,  
7 correct?

8 A. Yes, correct.

9 Q. So, it doesn't exclude anything else, correct?

10 A. That's correct.

11 Q. However, the Blue Castle project would  
12 exclude, for example, other uses of the significant  
13 water involved, correct?

14 A. I have no opinion on the water aspects of the  
15 project. I don't know whether it would exclude other  
16 people or not.

17 Q. Well, let's assume that it's being used.  
18 Then, it would, certainly, exclude other uses of that  
19 water, wouldn't it?

20 MR. WRIGHT: Objection, Your Honor. This is way  
21 outside the scope of his expertise. It's, certainly,  
22 outside the scope of re-direct.

23 THE COURT: It is. What do you say for that?

24 MS. SWENSEN: I believe that it has to do,  
25 directly, with what he just testified, that it doesn't

1 exclude anything else and that he considered the cost  
2 of water in the financial profiles of the various  
3 nuclear plants.

4 THE COURT: I don't think that's exactly-

5 MS. SWENSEN: Which part?

6 THE COURT: What you're asking about is the  
7 specific cost of water on this project. Isn't that  
8 what you're asking about?

9 MS. SWENSEN: No. What I'm asking about is  
10 whether, in fact, when this water is put to use in this  
11 project, whether he's considering that it could be used  
12 for other purposes.

13 MR. WRIGHT: But we're not here talking about  
14 every other purpose that water can be used for. We're  
15 talking about power generation. It's easier to talk  
16 about one kind of project.

17 MS. SWENSEN: That's true, but when he said  
18 nuclear power, this project is not exclusive of other  
19 options.

20 THE COURT: I think he meant other power options.  
21 I think he's looking at portfolio.

22 MS. SWENSEN: All right.

23 THE COURT: At least that was my understanding.  
24 I'm not trying to put words in Dr. George's mouth.

25 MS. SWENSEN: Let me re-phrase that.

1 THE COURT: Re-phrase the question.

2 Q. Have you considered whether this project, the  
3 Blue Castle project, would trade-off with any other  
4 potential energy generation projects?

5 A. In terms of what?

6 Q. In terms of, for example, the use of water.

7 A. I have no opinion on the water. I don't know  
8 if there's a constraint, for example, on the water  
9 resource, which means that, if Blue Castle used the  
10 water, somebody else can't use other water. So, I have  
11 no opinion on that.

12 Q. And, also, no opinions. So we're clear, on  
13 the value of the water, as we said, does not come into  
14 play in your analysis?

15 A. So, my analysis includes water as part of  
16 operations and maintenance cost, on average, across the  
17 U.S. I will say, since water is such a tiny part of  
18 O&M, and O&M is such a tiny part of the levelized cost  
19 of energy, it doesn't matter how expensive the water  
20 is. I will tell you the conclusion is the same.

21 MS. SWENSEN: Thank you.

22 MR. WRIGHT: Nothing further.

23 THE COURT: Ms. Valdes, anything else?

24 MS. VALDES: Nothing, Your Honor.

25 THE COURT: I have one question, Dr. George.

1 Maybe I misunderstood this. You indicated, just in the  
2 last few moments, that—you're talking about subsidizing  
3 alternative energies that they have required to be part  
4 of an IRP. Is that right?

5 A. So, not necessarily within an IRP, but there's  
6 a different policy instrument, in many states, which is  
7 called a renewable portfolio standard or RPS and,  
8 sometimes, the State will say there needs to be 20 or  
9 30 percent renewables or low carbon energy within the  
10 portfolios of energies sold in that state and, so, for  
11 example, Utah has defined this, broadly, to include any  
12 low carbon and to include nuclear, explicitly, at a  
13 twenty percent level, but other states define what's  
14 permitted and what the level is differently.

15 THE COURT: Thank you. I appreciate that.

16 A. You're very welcome.

17 THE COURT: Anything on that from anybody?

18 MR. WRIGHT: No, Your Honor.

19 THE COURT: Thank you, Dr. George. I appreciate  
20 your time today.

21 DR. GEORGE: You're welcome.

22 THE COURT: Next witness, Mr. Wright?

23 MR. WRIGHT: Yes, Your Honor, the applicants call  
24 Rob Graber.

25 THE COURT: Rob Graber?

1 MR. WRIGHT: Robert, sorry.

2 ROBERT GRABER called as a witness by the  
3 defendants, being first duly sworn, was examined and  
4 testified on his oath as follows.

5 THE COURT: Please have a seat, Mr. Graber.

6 DIRECT EXAMINATION

7 BY MR. WRIGHT:

8 Q. Hi, Rob. Would you give us your full name,  
9 please?

10 A. Robert Ben Graber.

11 Q. And let's start with your educational  
12 background, please.

13 A. I have a master's degree in nuclear  
14 engineering, a bachelor's degree in mechanical  
15 engineering and an MBA in economics from the Stern  
16 School of Business at New York University.

17 Q. And tell me about your professional experience  
18 prior to joining Blue Castle.

19 A. I spent most of my life or most of my career  
20 on the commercial side of the nuclear industry,  
21 approximately twenty some-odd years with General  
22 Electric as an economist and, prior to that, I spent  
23 five years with Chase Manhattan, Vice-President at  
24 Chase Manhattan, in their energy economics division,  
25 advising the bank on matters of utilities and nuclear

1 fuel markets.

2 Q. Okay and after that?

3 A. After that, in 2002, I joined Tom Retson and  
4 was the founder of Energy Path and we have been in  
5 business since that time and I am a principal and co-  
6 owner of the business.

7 Q. And Energy Path is what? What does it do?

8 A. Energy Path is a nuclear consultancy that  
9 advises clients, internationally, on economic and  
10 financial matters related to nuclear power and market  
11 matters also. We do planning and strategic analysis as  
12 well.

13 Q. And you joined Blue Castle when?

14 A. Well, it was about 2007, I think. At the same  
15 time, I came along with Tom Retson and Energy Path and  
16 Aaron Tilton, together, co-founded Blue Castle, at that  
17 time, a transition-

18 Q. Transition, right, and, then-okay, and what is  
19 your role at Blue Castle?

20 A. I'm the Senior Vice-President and Chief  
21 Economist.

22 Q. And what does that mean? What do you do for  
23 Blue Castle?

24 A. I manage or I do all the analysis and manage  
25 the economic business model. I want to separate the

1 economic business model from the actual management  
2 business model which the economic business model  
3 underpins how we manage this business and I manage that  
4 economic model and also engage in any economic studies,  
5 including the PacifiCorp IRP to which we are  
6 stakeholders. So, I do all matters of finance and  
7 economics with the company. That's what I'm  
8 responsible for.

9 Q. All right. Would you describe your—you said  
10 that Blue Castle is a stakeholder in the PacifiCorp  
11 IRP. What do you mean by that?

12 A. In 2013, Aaron Tilton advised me to become a  
13 stakeholder. He advised us to start attending the IRP  
14 meetings. At that time, the 2013 IRP was approximately  
15 two-thirds done when we entered the process. We signed  
16 in and became valid stakeholders in the process.

17 At the time we got in the 2013 IRP process, we  
18 were, really, by that time, most of the cases had been  
19 run. Most of the portfolio work had been done. So, we  
20 really didn't have as much impact at that time.  
21 However, we are just beginning the 2015 and we are  
22 going to be very active stakeholders in the 2015 IRP  
23 process. In fact, I just missed a meeting, yesterday,  
24 because I was here. I couldn't attend the first  
25 meeting of the 2015 IRP.



1 Q. All right and let's get a clear understanding  
2 of exactly what the PacifiCorp IRP is. What is its  
3 purpose?

4 A. It's a mandated—every two years, they do  
5 integrated resource planning which is required. It's a  
6 regulatory requirement which advises both the  
7 management of PacifiCorp and their Public Service  
8 Commission as to how the utility plans to meet the  
9 customer requirements over a 20-year process.

10 Q. All right and our role in the trial in this  
11 matter is to provide opinions concerning project or  
12 economic feasibility?

13 A. Yes.

14 Q. Okay. The first thing I would like to do is  
15 have you turn to Exhibit 60 in the binder, please.

16 A. Okay. I think this is upside down. Okay,  
17 yes, I have it.

18 Q. Okay. You heard Dr. George testify concerning  
19 his use of this spreadsheet, correct?

20 A. That's correct.

21 Q. The first thing I want to ask you is what  
22 does—excuse me, what does EPNM stand for up there in  
23 the title?

24 A. Yes. Tom Retson described, yesterday, that we  
25 had done a study for the TIAC in 2005.

1 Q. A study for what?

2 A. TIAC, the Texas Institute. It was the major  
3 study we did prior to joining Aaron Tilton in Blue  
4 Castle. So, at that time, we developed a model, a very  
5 explicit model, which did cash flow analysis for a  
6 nuclear plant. It was, as far as I know, probably, the  
7 most explicit model for nuclear plants that's,  
8 probably, ever been devised because it deals,  
9 specifically, with every aspect of a nuclear plant in  
10 order to develop a valid cash-flow statement which is  
11 what Exhibit 60 is.

12 Q. Okay.

13 A. We provided this to Glen George when he  
14 testified.

15 Q. Right and, so, I'm not sure I understand, yet,  
16 what EPNM—

17 A. I'm sorry. It's the Energy Path Market Model.

18 Q. Okay.

19 A. It's the cash flow model generated from a  
20 nuclear plant. So, it values the nuclear plant because  
21 it uses discounted cash flow methods and present value  
22 analysis, in this case, to determine the value of a  
23 nuclear plant.

24 Q. Okay and, so, it's just—the EP part, the  
25 Energy Path, that's just, sort of, the proprietary

1 nature of it?

2 A. Yes. Our company is Energy Path.

3 Q. Okay, got you. Now, in your analysis of the  
4 question of economic feasibility, you looked at energy  
5 demand.

6 A. Yes.

7 Q. And where did you look? What were your  
8 sources to determine the need for energy in Utah and  
9 the surrounding area?

10 A. Well, we chose two sources. I think Glen  
11 George—Dr. George referred, this morning, to WEC. WEC  
12 is, actually, one sub-region of the National Electric  
13 Reliability Counsel's—

14 Q. Also known as NERC.

15 A. NERC, correct, and we looked a little closer  
16 into WEC. We looked at the direct sub-region in which  
17 Utah is located. It's called the Basin. So, we  
18 looked directly at that one rather than just look at  
19 all of WEC. We also used the PacifiCorp IRP as a  
20 source of demand, looking at what PacifiCorp viewed as  
21 incoming demand.

22 Q. And what were you able to determine based on  
23 the WEC portion of the analysis, that NERC piece that  
24 you looked at, in terms of demand?

25 A. Utah is a very fast growing state and, so, the

1 basic sub-region is influenced, a lot, by Utah. In  
2 fact, four of the five fastest growing states in the  
3 United States are in the Western United States, not in  
4 the WEC region, but they are in the west. So, we  
5 looked at the base and sub-range and—I'm sorry. Would  
6 you repeat that question?

7 Q. I just wanted to—I was asking you about what  
8 you determined based on your review of the WEC sources.

9 A. Yes. There is a—because Utah is growing so  
10 rapidly, Basin sub-region is growing quite rapidly and  
11 there is going to be a need for new capacity, almost  
12 immediately, in Utah. What NERC does is look at  
13 forecast, demand and, then, looks at what has been  
14 reported by all load-serving entities or electric  
15 utilities that can meet that demand and they project it  
16 into the future and get an idea of how much capacity is  
17 going to be needed over the next ten years.

18 Q. Would you turn to Exhibit 62?

19 A. Yes.

20 Q. Would you tell the Court—obviously, this is  
21 rather self-explanatory, a graph showing states and  
22 their growth by rank. Is this something that you  
23 prepared?

24 A. Yes.

25 Q. And what was your source?

1           A. This was the census report, the 2010 census  
2 reel from the U.S. 2010 population growth estimates and  
3 it shows that Utah is the third fastest growing state.

4           Q. And its neighbors, Nevada, Utah, Idaho, are  
5 fast-growing as well?

6           A. Yes. That's what I said. Four of the five of  
7 the fastest growing states are here, in the west.

8           Q. And this might help orient the Court as to  
9 what WEC looks at. Would you look at Exhibit 63?

10          A. Yes. I tried to show the eight sub-regions,  
11 the eight regions within NERC. These regions are  
12 chosen because of the fact that the load-serving  
13 entities tend to serve loads in the regions,  
14 themselves, and there is some flow across each one of  
15 these regions and I've identified where the Blue Castle  
16 site is within that.

17          Q. Okay. Now, turn to Exhibit 63—I'm sorry, 64.  
18 Is this another graph that you assembled?

19          A. Yes. This follows from the NERC analysis. It  
20 shows that Utah has the fourth fastest growing electric  
21 demand in the United States and, again, we see the  
22 predominance of western states at the level of the  
23 fastest growing states. Utah is, roughly, around 1.6  
24 percent, according to NERC.

25          Q. And where is Blue Castle's target market?

1           A. Blue Castle's target markets are Basin, of  
2 course, because that's where we're located. Also, the  
3 Cal South market, which is Southern California, and the  
4 Rock Market, which is the Rocky Mountain area. So,  
5 where it says WEC, for instance, Rock, that would be  
6 the Rocky Mountain sub-region within WEC. These are  
7 all markets, as you mentioned, these are all markets  
8 for Blue Castle. So, we tend to focus on them.

9           Q. Now, did you look at the question of needed  
10 capacity, projected out into the future, for purposes  
11 of determining economic feasibility?

12          A. Yes.

13          Q. And what did you conclude in terms of that  
14 need?

15          A. Well, there's a substantial need. I say  
16 there's a—yeah, I'd go with a substantial. I'm sorry.  
17 There's going to be a need for—there's a need, almost  
18 immediately, in 2014 in the Basin region. Following,  
19 quickly, in 2015—I think it's, actually, an exhibit.

20          Q. We're going to turn there next.

21          A. Okay.

22          Q. Let's go ahead and go. Go to Exhibit 65.

23          A. Yes. This shows the—

24          Q. First, tell me your source for this exhibit.

25          A. This, again, is NERC.

1 Q. Okay.

2 A. And I've indicated, by the ovals, which  
3 regions, within NERC, are BCH markets, including Basin,  
4 of course, and I've also showed, on this chart, given-  
5 NERC breaks it down into expected resources, which are  
6 identified by the load-serving entities as being  
7 available to make load in those regions and potential  
8 resources is loads that could, possibly, come online to  
9 help meet load as well. So, these dates, on these  
10 lines, indicate the need for at least the beginning of  
11 where new capacity will be needed.

12 Q. I see, within those sub-regions.

13 A. That's right.

14 Q. Okay. Now, you've talked about the PacifiCorp  
15 IRP. What does PacifiCorp anticipate in terms of  
16 generating capacity versus demand, going forward?

17 A. They are already breaching their reserve  
18 margins.

19 Q. What do you mean by that?

20 A. Well, they have—in order to maintain adequate  
21 capacity to serve load, you don't just build enough  
22 capacity to serve load. You need to have a cushion in  
23 there in case there's a spike in demand or a break-down  
24 of a generating resource. So, they use a thirteen  
25 percent reserve margin.

1           When PacifiCorp, or any utility, falls below its  
2           reserve margins, it indicates—it's an indicator of a  
3           need to augment capacity and that starts in 2013 and,  
4           so, the PacifiCorp IRP process was to see how they were  
5           going to fit resources in that particular—

6           Q. Turn to Exhibit 66 and this depicts the  
7           PacifiCorp shortfall based on the 2013; in other words,  
8           the most recent PacifiCorp IRP?

9           A. Yes. Yes. This is the—the gap is what they  
10          need to fill and, so, you can see, immediately, that it  
11          goes to something like 2,000 megawatts are going to  
12          have to be identified by 2022.

13          Q. And assuming no new generating capacity gets  
14          online or able to satisfy this, does PacifiCorp,  
15          simply, have to go outside, somewhere, and buy the  
16          power?

17          A. Yes.

18          Q. Would you tell the Court what a Monte Carlo  
19          analysis is?

20          A. Yes. As a matter fact, EPNM is a Monte Carlo  
21          simulation. A Monte Carlo simulation simply recognizes  
22          risk and uncertainty in a forecast and what it does is  
23          it takes variables that we don't—we have uncertainty  
24          associated with them and it puts—it enters them as  
25          probability curves within a cash flow analysis. So,



1 everything that we don't understand, for instance we  
2 don't understand the price—we don't know the price of  
3 natural gas. We don't know exactly what load demand  
4 will be. We don't know whether there's going to be  
5 carbon—and, so, all those are entered into the model.

6 Q. Wait, finish that thought. We don't know  
7 whether there's going to be carbon—

8 A. Carbon legislation.

9 Q. Right.

10 A. We don't know how many coal plants are going  
11 to be closing as a result of EPA regulations and, so,  
12 all of this leaves a lot of uncertainty. So, this  
13 uncertainty is led into the model which, then, runs,  
14 let's say, 1,000 to 5,000 times sampling each of the  
15 uncertainties and developing a value of the plant and  
16 this value, because the input was probabilistic, the  
17 output is a stochastic or probabilistic curve showing  
18 the potential range of values that will be—are likely.

19 Q. Explain, if you would, please, how the Blue  
20 Castle model is attempting to deal with this  
21 uncertainty and structure itself around meeting the  
22 demand that is out there?

23 A. Okay. The economic model--which we've heard  
24 several times today, not just from me. We've heard it,  
25 several times, from other witnesses—is a real options

1 model. In this case, it's a sequential options model.

2 Q. What do you mean by that?

3 A. I mean by that that the—in order to—instead of  
4 just looking at making an investment in a nuclear plant  
5 and, then, finding out—determining the value of the  
6 plant, what we do is we break-down the investment  
7 process from ESP, COL and, then, construction. Each  
8 one of those has an option value. The plant has  
9 optionality because, as long as the plant is not built,  
10 there are options available to the developers of the  
11 plant and those options have significant value and we  
12 value each one of the phases of investment, the ESP,  
13 the COL, and if the model indicates that there is  
14 enough value created by the optionality, then, it  
15 justifies the investment and, as we go along, of  
16 course, we continue to update the model with  
17 information from the future and attempt to resolve  
18 these uncertainties that are amongst—that continue to  
19 influence the decision-making that we do.

20 Q. Okay.

21 A. In other words, the option value of the plant,  
22 the construction value, is the last of the investments  
23 we make and it has its own value and the next value  
24 down ends on the value in front of it. We, actually,  
25 go backwards from the fact that we know what the

1 construction value is. We, then, know what the COL,  
2 which is depended on the construction value and,  
3 finally, the ESP is depended on the COL value and that  
4 is what we call sequential.

5 Q. Would you explain—there's been testimony about  
6 what portfolio theory is and how it works. We don't  
7 need to re-cover that, but how has portfolio theory  
8 factored-in to the Blue Castle model, the Blue Castle  
9 business plan?

10 A. We have not used portfolio theory.

11 Q. So, that's not what we're looking at. In  
12 other words, we're not looking at developing multiple  
13 sources, Blue Castle is not.

14 A. No. We have taken a portfolio view, meaning  
15 that we have looked at the risk and the cost together  
16 instead because what's going on here and what is  
17 changed is that, prior to looking at all this risk and  
18 uncertainty, as Dr. George stated this morning, almost  
19 all decisions about what capacity additions to make  
20 were based on the lowest cost generating resource.  
21 That has changed drastically. It has changed,  
22 drastically, since energy markets became highly risky  
23 after the OPEC oil embargo, after natural gas was de-  
24 regulated. Suddenly, volatility started appearing in  
25 energy markets.

1 Q. Let's talk about that. There was testimony,  
2 earlier, about a spoke in natural gas prices that  
3 occurred around 2000.

4 A. Uh-huh [affirmative].

5 Q. Roughly? Would you talk about—you mentioned  
6 de-regulation, but what happened, about that time, that  
7 caused gas prices to rise.

8 A. Well, actually, it is not entirely widely  
9 known what caused that to happen, but it is—studies  
10 that have been done have shown that these markets were  
11 being, effectively, speculated or gamed and you may  
12 remember, about that time, Enron—

13 Q. Yes.

14 A. -was failing and Enron was, clearly, gaining  
15 markets and, so, the de-regulation of the natural gas  
16 markets opened-up possibilities this might happen and  
17 it came in 2000. This began to—the volatility of  
18 natural gas, now being de-regulated, began to show up.

19 Q. Okay.

20 A. And the reason—well, there's one other thing.  
21 The reason for that is because the demand for natural  
22 gas increased, very rapidly, after the OPEC oil embargo  
23 and the lack of petroleum was lost as a generating  
24 resource. Natural gas was the one resource that we  
25 developed and, then, as a result of that, they

1 developed the combined cycle gas turbine and that was  
2 the [inaudible] to use and, so, as demand was met by  
3 these combined cycle generating turbines, natural gas  
4 began to use more—they used more and more natural gas  
5 and it became a highly unstable market.

6 Q. Okay and you heard Dr. George testify about  
7 the current low prices for natural gas and some of the  
8 reasons behind that: a big spike in supply based on  
9 ability to get it out of the rock that we didn't have  
10 previously.

11 A. Yes.

12 Q. In terms of fracking and other things that  
13 have become more common. So, it has increased the  
14 supply.

15 A. Yes.

16 Q. Now, let's talk about risk analysis. There's  
17 been quite a bit of discussion. How is Blue Castle  
18 evaluating risk in connection with developing this  
19 project and, specifically, pursuing the ESP?

20 A. Yes. Well, I mentioned, before, the EPNM is  
21 the model that we use and it's, basically, a list-based  
22 model to determine the value of the generating in this  
23 case and—I'm sorry. [inaudible]

24 Q. We're just talking about risk analysis and how  
25 Blue Castle—

1           A. Oh and, so, we keep saying risk analysis, but  
2 there is a—in real option analysis, which is looking at  
3 the value of the optionality, our sequential option  
4 analysis is all summed-up. All this uncertainty that  
5 we are talking about is summed-up in the word  
6 volatility. Volatility is, basically, used in a real  
7 options analysis to, basically, symbolize, oh, we don't  
8 know and, in order to get that volatility, you have to  
9 simulate the operation of the nuclear plant and  
10 determine how its value changes for each of the 1,000  
11 to 5,000 samples that it takes and it develops this  
12 probabilistic value curve and, so, that's the use of  
13 the EPNM. Then, we do a real options analysis using  
14 that volatility to determine—yeah.

15           Q. Okay and, so, Exhibit 60, the EPNM thing you  
16 just mentioned, that's a, sort of, I guess you could  
17 think of it as kind of a snapshot of a nuclear power  
18 plant in operation?

19           A. Yes.

20           Q. With ongoing expenses, income, all those  
21 factors. That's the spreadsheet.

22           A. I'd like to clarify that a little.

23           Q. Please.

24           A. There was some confusion this morning. The  
25 cash flow statement that you see there are operating

1 cash flows. The interest line—the line that showed  
2 interest in there was only for the purposes of  
3 calculating the tax shield. It was, then, put back in.  
4 If you, then, look at the cash flow statement, you  
5 will see interest added back in. This has nothing to  
6 do with the capital. The cash flow is what pays back  
7 the capital from the nuclear plant, or any asset, you  
8 know, financial asset are the operating cash flows.

9 So, we look at the operating—in this case, they  
10 are called capital cash flows because we do take into  
11 account that tax shield. So, then, we look at the  
12 value that determines, with a discounted cash flow,  
13 that determines the value of the nuclear plant. To get  
14 its net present value, you would, then, subtract out  
15 that investment.

16 Q. Subtract out which investment?

17 A. The investment in the plant.

18 Q. Okay. All right. I want to talk, a little  
19 bit in more detail, about the real options approach and  
20 how Blue Castle employs it. Just broadly speaking,  
21 real options means what?

22 A. In about, I want to say, almost 50 years ago,  
23 there was a break-through in the financial markets and  
24 it was discovered how—a new way for—not a new way, but  
25 they learned how to price investors' risk so they could

1 hedge this risk in their securities and that was  
2 culminated in the development of the Black Scholes  
3 Model, the Black Scholes Equation, which enabled  
4 investors to price the option. The options are,  
5 basically, put some calls, for instance.

6 Q. Can you put that in a concrete example for us?

7 A. Yes. If I was in an investor and I wanted to  
8 invest in a stock, but I did not want to take the risk  
9 associated with ownership of the stock, I would pay a  
10 relatively small fee. The Black Scholes Equation would  
11 be used. It would determine what the value of the  
12 option is. It's relatively small and, then, I would  
13 have the option to—I would have the right to exercise  
14 that option, but I would not have the obligation.

15 So, if the stock went down, or it didn't get to  
16 the level that I base my call on, the call option, I  
17 would, simply, throw it away. I've lost only the small  
18 amount of money that I put down to buy the option. If  
19 it pays off, then, I won. I, essentially, will be able  
20 to buy a stock at a lower price than it currently is at  
21 the time the option expires.

22 Q. Right.

23 A. Now, as a result of that, shortly thereafter,  
24 it was discovered, by several very brave economists,  
25 that real assets, meaning real assets like financial



1 assets—not financial, like generating assets, assets  
2 that are not part of the financial markets, also  
3 possess options and, so, all the theories and all of  
4 the applications in financial markets became applicable  
5 in options markets and that's why we call them real  
6 options because it's not a financial option. It is a  
7 real asset that is used.

8 It's not a perfect fit, but what it does is  
9 exactly the same thing. It determines, for instance,  
10 the ESP. It would tell us that, for a very small  
11 investment, which is, basically, compared to the entire  
12 cost of—

13 Q. Let me stop you there. That's what you're  
14 comparing it to?

15 A. Yes.

16 Q. The cost of a completely built and operating  
17 plant is billions. We're talking about investment to  
18 get an ESP at 40, 50 million dollars.

19 A. Right because the optionality, again, just  
20 like the financial, you pay a very small amount and you  
21 control—you had your risk. You control this option,  
22 okay? If you do this on a real option, the ESP,  
23 essentially, is the amount that you are willing—it's a  
24 very small amount relative to the amount of value you  
25 control in ownership of the asset without having to—in

1 other words, you can make a decision, right up front,  
2 to build a nuclear plant and spend 16 to 18 billion  
3 dollars. That would be fool-hardy, right?

4 Q. Uh-huh [affirmative].

5 A. So, we're not going to do that. We are,  
6 effectively, saying we may know the uncertainty is  
7 producing the option value in the plant. Then, there's  
8 option value because we have options. We can either  
9 cancel the plant. We could delay the plant. We could  
10 scale the plant or we could do many things. All of  
11 those provides us with value through the option we have  
12 and, so, we, then, take that analysis and determine  
13 what is justified, today, to spend on an ESP and we ran  
14 it through all the calculations and determined that the  
15 amount of the ESP was economically justified.

16 Q. And it's Blue Castle taking that risk.

17 A. Absolutely.

18 Q. In other words.

19 A. We are entrepreneurs.

20 Q. Yeah. You haven't asked the State of Utah to  
21 jump in on this.

22 A. Absolutely not.

23 Q. PacifiCorp hasn't jumped in. They're not  
24 taking any risk on this.

25 A. No.

1 Q. But PacifiCorp could end up benefitting as an  
2 option to buy power if it ever gets that far.

3 A. Yes. The big difference, I think—I think this  
4 is very important. The big difference of what we are  
5 doing in our business model is that we are selling the  
6 option. We are not going to build the plant, okay?  
7 That is not our goal. Our goal is to sell—now, we  
8 would take a role. We may, very easily, take a role in  
9 the ultimate, but what is unique about nuclear plants,  
10 as opposed to most other generating assets, is this  
11 backability.

12 The entity that buys the real option cost will  
13 have the right, but not the obligation, to construct a  
14 nuclear plant on the Blue Castle site over this 20 to  
15 40 year period, which is unique to nuclear plants. So,  
16 there's a lot of value because a lot can happen in 20  
17 to 40 years. There's a wide range and the utility—not  
18 only does the utility benefit from all the de-risking  
19 that we've done, but they also, for a very small cost  
20 relative to the cost of the plant, can control the  
21 asset and uncover the uncertainties that we are  
22 managing right now.

23 Q. Okay and you make the decision concerning  
24 options, as you take each step, about where to go once  
25 the step is complete.

1           A. That's right. As soon as the ESP is  
2 completed, we will determine the state and nature at  
3 that time, as they say. We will determine what  
4 uncertainties still exist and if, in fact, we are  
5 justified, economically justified, we will enter into  
6 the COL process.

7           Q. Now, you're aware—you were here for the prior  
8 testimony yesterday?

9           A. I was here the whole time.

10          Q. Yes. Blue Castle is currently leasing the  
11 water rights involved for purposes of this project from  
12 Kane and San Juan County Water Conservancy Districts.

13          A. Uh-huh [affirmative].

14          Q. And, so, at any point along this process, if  
15 the project is stopped for one reason or another, or  
16 cannot proceed for one reason or another, what happens  
17 to those water rights?

18          A. Returns to the counties. It's not being used.

19          Q. And, in fact, under the leases, can be used,  
20 on short-term basis, if the districts wanted to pursue  
21 that option. Do you recall if that's a term in the  
22 lease? You may not have seen that.

23          A. Yeah. Aaron Tilton is.

24          Q. Okay. Now, in terms of capital costs, when  
25 you're looking at comparing new generation, capital

1 costs is, obviously, a consideration.

2 A. Uh-huh [affirmative].

3 Q. Nuclear power plants are very expensive.

4 A. Very expensive, correct.

5 Q. And—but once you get beyond capital costs, O&M  
6 and fuel; in other words, just the cost to get the  
7 electricity out of the plant and in the grid, how does  
8 nuclear compare?

9 A. Well, it's probably—it is the lowest  
10 production cost resource. It's very stable. It can  
11 produce a lot of income for the utility. The fuel cost  
12 and the O&M cost, both variable and fixed, are the  
13 lowest of any thermal generating asset in the United  
14 States. I think the figure is about \$24.00 a megawatt  
15 hour and the gas and coal are somewhere around \$34.00 a  
16 megawatt hour.

17 Q. Okay and, again, that's just to, you know, get  
18 the power out of the plant?

19 A. That's the marginal cost of power, yes. That  
20 is the marginal cost.

21 Q. Okay. So, despite the uncertainty—or, maybe  
22 because of the uncertainty, I would like you to explain  
23 your opinion that this project is economically  
24 feasible. Given high capital costs and we don't have a  
25 crystal ball, what persuades you that the project

1 should continue through the ESP stage?

2 A. Well, I wouldn't go so far to say economically  
3 feasible. It's economically feasible to maintain the  
4 option.

5 Q. Okay.

6 A. That's what I would say.

7 Q. Okay. Why?

8 A. Because it makes economic sense to do so.

9 Q. Explain. How does it make economic sense? Go  
10 ahead.

11 A. Because of the fact that—in the case of  
12 nuclear, as opposed to natural gas, the major risk  
13 component of nuclear power is, clearly, in the  
14 construct cost, up front. The risk of natural gas is  
15 afterwards. After you've constructed the plant, you,  
16 then, have to manage a fuel risk. Those are risks, but  
17 they are very qualitatively different and this is the  
18 key answer, I think. You can always stop the  
19 production—the construction of a nuclear plant. You  
20 have options. You can cancel it, delay it. So, that  
21 risk is, basically, in your hands and available to be  
22 managed.

23 In a gas plant, the risk comes after you've sunk  
24 the costs, after the plant is already built, and you're  
25 committed to natural gas. At that point, you are

1 clearly subject to the global—or, at least, right now,  
2 the U.S. markets and that is a risky bet and we think  
3 that we have enough belief that there is enough  
4 uncertainty in what's going to happen to natural gas  
5 and I say that because coal plants are closing and  
6 natural gas plants are being built. There is going to  
7 be an LNG market. There are three terminals—

8 Q. LNG means?

9 A. Liquefied natural gas. Whereas, people are  
10 quite used to there being a global petroleum market.  
11 Meaning there's one global price, basically, accounting  
12 for differences and location. There's, basically, one  
13 price, globally, for petroleum. There's no such thing  
14 as a global LNG market because these markets are  
15 separate from one another and the prices in which they  
16 are established are completely different mechanisms.

17 In one case, in Japan, I think Dr. George  
18 mentioned the price was \$14.00 and, actually, \$15.00,  
19 just recently, where our gas, here, is \$3.50,  
20 approaching \$4.00. In Europe, it's \$11.00. Well, as  
21 long as these markets are not capable of reaching one  
22 another—in other words, the producers cannot reach the  
23 consumers—then, those anomalies will prevail, but what  
24 is happening is we are developing the capacity for  
25 producers to meet consumer demand in these other

1 markets through the liquefied natural gas markets in  
2 which we liquefy natural gas, load it onto tankers,  
3 just the same way as they do petroleum, you know, and  
4 reach these other markets.

5 Now, a producer of natural gas, who is getting  
6 \$3.50 in the U.S., is going to be looking at Europe and  
7 Japan, realizing that even accounting for the cost of  
8 liquefying and the transportation cost is, probably,  
9 going to make a lot more sense to get it over there  
10 and, in fact, we are building LNG terminals. We are  
11 already approved. One, just recently and there's  
12 between 12 and 18 waiting.

13 I want to point out that the amount of—the  
14 terminal capacity, right now, just the capacity, right  
15 now, to exporting gas is already eight percent of the  
16 U.S. market. Imagine what happens, now, when you bring  
17 on 18 more LNG terminals. You get up to a substantial  
18 amount of gas. So, even though we're producing a lot  
19 of shale gas, there's also going to be a lot of demand  
20 occurring for that gas now, in new markets, that our  
21 producers are pursuing.

22 Q. Which is to say the United States is getting  
23 into the natural gas export business.

24 A. Yes. That's the value of the shale gas,  
25 predominantly.



1 MR. WRIGHT: Can I have just a moment, Your Honor?

2 THE COURT: Sure. Take your time.

3 Q. PacifiCorp IRP is in front of you, I think,  
4 Rob.

5 A. Yes. I've looked at it. I think I've, pretty  
6 well, got the page numbers memorized.

7 Q. All right. In the IRP, PacifiCorp talks about  
8 nuclear, but it doesn't include it as part of one of  
9 its preferred sources, correct?

10 A. Yes, correct. I want to point something out  
11 about their draft preferred portfolio. There are no  
12 other thermal resources, either, over the 20 year  
13 period. They're not building anything. In fact—

14 Q. When you say thermal resources, though, I want  
15 you to be clear what you mean.

16 A. Non-renewables, those that could be  
17 dispatched. They call them thermal resources because—  
18 well, actually, I'll let Dr. Diaz tell you why they're  
19 thermal resources. In any case, they're dispatchable.

20 Q. Dispatchable means?

21 A. You can turn them off and on.

22 Q. Base load. The power is there.

23 A. We have a wind plant. It's not dispatchable  
24 because the wind may not be blowing any time you need  
25 the power.

1 Q. Right.

2 A. So, you can't dispatch it. I want to also  
3 clarify the nuclear component within the PacifiCorp  
4 IRP—if you go back to the 2003 IRP, there is no nuclear  
5 component. Not a supply option, okay? As we go  
6 forward into 2007, we began to see nuclear come into  
7 the IRP as a supply option and, again, it was 2025 at  
8 that time and, now, it is fully indebted and, now, they  
9 are not only looking at nuclear, they are using data  
10 from the Vogtle plant to try to get its parameters as a  
11 supply option and I've actually mentioned, as was  
12 pointed out this morning, that it assumes that any  
13 nuclear plant will be built on the Blue Castle site.  
14 So, we've gone from not even considering nuclear in  
15 2003, to at least admitting that it is going to be a  
16 supply option after 2030.

17 Now, because the integrated resource plan,  
18 basically, doesn't hardly—it goes out just a little  
19 beyond 2030. You're not going to see much nuclear in  
20 there because the IRP model that they use to determine  
21 the portfolios will cut it off. It won't allow it to  
22 go into the portfolios before then and, in fact, this  
23 is another example of how uncertainty—because  
24 PacifiCorp is, in fact, doing—has embraced risk and  
25 uncertainty within their IRP. It wasn't always that

1 way.

2 In a 2013 IRP, they have done a job that, if I  
3 described it to you, you would blush. I mean, they had  
4 to run nearly a thousand cases because that's how they  
5 do the IRP. They've got 19 cases of potential  
6 assumptions that drive the model and determine which  
7 supply option is the best.

8 Q. Would you stop for a second? I'd like you to  
9 explain that. When you talk about assumptions and they  
10 run these models and take these samples, what does that  
11 mean, exactly?

12 A. Yes. They use curves for all of the  
13 uncertainties: natural gas, load demand and all the  
14 other uncertainties in the model and they arrange all  
15 of these assumptions in what are known as cases. So,  
16 they have these 19 cases. One of those cases, by the  
17 way, is case 18, which is the one that is the—assumes  
18 very high natural gas prices. It assumes high carbon  
19 prices. It assumes, you know, conditions that could,  
20 actually develop.

21 So, it turns out that nuclear is that—it comes  
22 into that portfolio if it were chosen, but what  
23 happened is that there is so much uncertainty, in the  
24 IRP process, that the models, now, come back and say  
25 don't build anything. They say it's better, now, to go

1 ahead and use demand side management, mainly front  
2 office transactions, which is the purchase of the  
3 wholesale power. They do have some wind. They have no  
4 thermal. They're building a gas plant, right now,  
5 which I think it will be finished in 2014, and no gas  
6 after that.

7 So, here, we have an electric utility that,  
8 basically, is not planning to build any thermal  
9 resources over the next 20 years and the reactor  
10 portfolio has all of these front office transactions,  
11 which are non—they are supply options because they do  
12 the same thing a generating asset would do, but they  
13 are not hard assets and, basically, you know, that  
14 could change overnight and these integrated resource  
15 plans can change on a dime depending on what they know  
16 at the time they do the IRP.

17 So, the draft preferred portfolio is almost  
18 entirely consisted of non—these electric utilities not  
19 building anything and, there, you have the influence of  
20 uncertainty in the Monte Carlo process that they used  
21 to determine the risk, the portfolio. They do the cost  
22 and the risk. That was not done previously. They did  
23 the cost.

24 Again, we have gone from determining the lowest  
25 cost generating asset as being the one we want to build

1 to one which accounts, now, for risk and Dr. George  
2 described that just a little while ago. You may have a  
3 very cost effective asset, but it could be very risky  
4 and, so, the draft preferred portfolio found the least  
5 risk, the most competitive least risk option,  
6 collection of assets that would meet their growing load  
7 demand.

8 Q. Okay.

9 MR. WRIGHT: Nothing further, Your Honor.

10 THE COURT: Thank you. Let's take a short break.  
11 We'll come back on the record about 10 minutes. Let's  
12 make it—yeah, let's come back at ten minutes after  
13 3:00. Court will be in recess.

14 [Recess.]

15 THE COURT: Please be seated, ladies and  
16 gentlemen. We are back on the record in Emery County  
17 Case Number 1207009, Heal Utah, et al. v. Kane County  
18 Water Conservancy District, et al. Counsel for both  
19 parties is present and Mr. Graber is on the stand.  
20 Cross-examination?

21 MS. SWENSEN: Yes, Your Honor.

22 THE COURT: Ms. Swensen?

23 MS. SWENSEN: Thank you.

24 CROSS-EXAMINATION OF MR. GRABER

25 BY MS. SWENSEN:

1 Q. Good afternoon.

2 A. Good afternoon.

3 Q. You're a Senior Vice President at Blue Castle,  
4 right?

5 A. I am indeed.

6 Q. Can you hear me all right? Can you hear me  
7 all right? I told them I'm not doing this correct.

8 A. Yeah. It's really hard to hear you.

9 Q. Yeah. I'll try and lean in a bit more.

10 A. That's fine.

11 Q. Okay and you're a stockholder as well?

12 A. Yes.

13 Q. How much of the company do you own?

14 A. A substantial amount as Energy Path.

15 Q. And you've described, in your report and  
16 today, that part of your responsibilities there are  
17 modeling the economic and financial aspects of the  
18 proposed project, correct?

19 A. Correct.

20 Q. As part of that, have you forecasted the  
21 anticipated share value if Blue Castle gets an ESP?

22 A. We have made some attempts at that. Aaron  
23 Tilton has asked me, on occasion, but it's really Aaron  
24 that handles that part of it. I do some modeling for  
25 him, but Aaron is actually looking at the company

1 management and the company value. He's managing that.

2 Q. Do you recall what the forecasted share value  
3 would be?

4 A. No. The problem is I haven't done it recently  
5 and I would hesitate to give a figure because Mr.  
6 Tilton is the owner of that number.

7 Q. When did you last do that forecast?

8 A. A year and a half ago, approximately.

9 Q. A year and a half ago? Do you think it's  
10 changed, substantially, since then?

11 A. Yes. I think it has because there's been  
12 value added to the plant.

13 Q. And, when you say value added, you mean the  
14 additional work that, for example, Mr. Evans described  
15 this morning?

16 A. Yes.

17 Q. Is there anything else?

18 A. The value of the stock, again, will depend on  
19 energy markets, ultimately, and what the plant is  
20 worth.

21 Q. So, that makes sense. When you say, then,  
22 that you believe that the value may have changed, since  
23 you last did a forecast a year and a half ago, are you  
24 also claiming that the market conditions have become  
25 more favorable for nuclear since that time?

1 A. The market, no. I would not say so.

2 Q. And, so, when you say the added value that you  
3 believe has come into play in the interim year and a  
4 half, is there anything, besides the work that Mr.  
5 Evans described, that has added value to the—

6 A. I must add, again, that we are using a real  
7 options model. Therefore, the value of the  
8 organization is a probability curve which has a most  
9 likely value and values out on the curve. So, when we  
10 try to pin down a number here, it's very difficult to  
11 do because, again, we are taking all this risk and  
12 uncertainty into account. We believe—we wouldn't be  
13 doing this if we didn't think we were adding value to  
14 the company—I mean, to the enterprise.

15 Q. So, really, as I understand your testimony  
16 from direct as well, what we're talking about—when you  
17 say it's hard to pin down a specific number, it's  
18 because we're just talking about different shades of  
19 probability, essentially.

20 A. That's correct.

21 Q. Right? And, as we move further along the  
22 timeframe for development of the proposed nuclear  
23 plant, you would anticipate decreased uncertainty as  
24 costs also increase, correct?

25 A. Yes.



1 Q. That's part of the de-risking or the option-  
2 based approach that you're taking?

3 A. Absolutely and, obviously, the additional  
4 certainty translates into more value for investors, the  
5 existing investors.

6 Q. Correct. You testified that, based on, I  
7 think, the 2011 IRP and, possibly, the 2013 as well,  
8 but you saw—no, it was the 2011, pardon me, that there  
9 was substantial need reflected, almost immediate, as  
10 early as 2014, for PacifiCorp in particular, correct?

11 A. The 2011 IRP?

12 Q. Uh-huh [affirmative].

13 A. Re-state the question, please.

14 Q. I heard you testify, today, that, based on the  
15 2011 IRP, that you saw a substantial need, an almost  
16 immediate need, as early as 2014, in terms of their  
17 resources.

18 A. Are you referring to the 2013 IRP? You say  
19 2011.

20 Q. I'll allow you to clarify. When you testified  
21 that there was a substantial—

22 A. Yeah, I'm just referring to the 2013.

23 Q. 2013, fine, that you see a substantial need  
24 which will need to be met as early as 2014, correct?

25 A. Yes.

1 Q. So—but there's no scenario under which Blue  
2 Castle can provide energy as early as 2014, right?

3 A. Absolutely not.

4 Q. And utilities, such as PacifiCorp, will have  
5 to commit to additional sources to prevent that  
6 shortfall in the interim, correct?

7 A. That is the purpose of the IRP, to identify  
8 those resources.

9 Q. I agree completely, to project these are the  
10 anticipated shortfalls going forward as far as 2032 and  
11 this is how we plan to meet them, correct?

12 A. Correct.

13 Q. And to meet all of those shortages that they  
14 forecast, they have put in place a plan for how they  
15 will address them, correct?

16 A. That is correct.

17 Q. And in the time frame that they are  
18 considering, up to 2032, they do not consider nuclear a  
19 viable option, correct?

20 A. They have made an assumption that nuclear is  
21 not a viable option before 2032. That's an assumption  
22 they made in their IRP process.

23 Q. And, in fact, in the preferred portfolio, it  
24 goes out to 2032, correct?

25 A. It does, but the primary focus, if you look at

1 the beginning of the document, you'll see that they  
2 tend to focus on the next ten years for planning  
3 purposes.

4 Q. Because those are the most immediate needs.

5 A. Right.

6 Q. But in the next, let's say, in the next ten  
7 years, is it possible that Blue Castle will begin  
8 producing energy?

9 A. In ten years, it will be 2023. There is a-  
10 yes. That is the time frame upon which we would  
11 expect. That would be one of the most rapid time  
12 frames we would expect.

13 Q. That would be fairly optimistic, correct?

14 A. I believe that it's doable, but yes. I would  
15 call it more like 2025, perhaps. Between 2023 and  
16 2025.

17 Q. So, but when—to be clear, to your  
18 understanding, when PacifiCorp says that they have  
19 concluded that nuclear is not a viable option for their  
20 service area before 2030, that is not because they  
21 don't think Blue Castle can produce energy before that,  
22 correct?

23 A. That's right. You have to—PacifiCorp is not  
24 what we call a nuclear utility by any stretch. Nuclear  
25 is fairly new to them and, so, they are learning how to

1 take it into account as they begin to consider it as a  
2 resource option.

3 Q. Let's look at Exhibit 60, the EPNM discounted  
4 cash flow analysis, which I have to grab. At the risk  
5 of beating a dead horse here, I, honestly, have just a  
6 clarification.

7 A. Sure.

8 Q. Is it fair—you prepared this, correct?

9 A. Yes.

10 Q. Okay. I know that Dr. George testified,  
11 earlier, that he had reviewed it, but that it was  
12 prepared by Blue Castle and, by Blue Castle,  
13 specifically, it's you, right?

14 A. That's right. This is one run of the Monte  
15 Carlo analysis. We run five thousand of these.

16 Q. Because that's the nature of the Monte Carlo  
17 analysis—

18 A. That's right.

19 Q. -to take into account as many different  
20 scenarios and various risk adjustments as you could,  
21 correct?

22 A. Right, but we needed to supply Glen George  
23 with—so he could see how we were doing our accounting.

24 Q. Okay. So, this is—did you supply him with any  
25 other scenarios that you had produced under the Monte

1 Carlo analysis?

2 A. No.

3 Q. Just this one. How did you pick this one?

4 A. Well, basically, completely, we are more  
5 interested in Dr. George seeing the cost because  
6 there's revenues in here also, and I don't think Dr.  
7 George is really interested. He's interested in how  
8 we're accounting for the costs of the nuclear plant and  
9 whether this type of accounting actually makes sense.

10 Q. And that's, specifically, what I would like to  
11 clarify is there was some discussion—I think you  
12 indicated, in your direct, that we were, perhaps,  
13 confusing terms a little and, so, I would like to  
14 clarify, for certain. The line item that is entitled  
15 the interest on total debt.

16 A. Uh-huh [affirmative].

17 Q. You indicated that that was, perhaps,  
18 mischaracterized as containing all the previous costs,  
19 correct?

20 A. All the what?

21 Q. All the costs.

22 A. You mean the investment cost?

23 Q. Yes.

24 A. That's not true.

25 Q. It does contain all the capital costs?

1 A. No. It only has the interest on debt.

2 Q. Okay. That is my question, then.

3 A. That is not—that line, in there, is in there  
4 for one reason and one reason alone.

5 Q. The tax shield you mentioned.

6 A. The tax shield calculation. You'll notice  
7 it's added back in.

8 Q. So—but my question is—and I admit. I don't  
9 understand the ins and outs of the tax code and I don't  
10 think that we need—I'm sure you do better than I do,  
11 but I don't know that we need to get into that. For my  
12 purposes, what I'm trying to understand is does that  
13 line item also—I understand the inclusion of it was for  
14 purposes of the tax shield, but if we, as I discussed  
15 with Dr. George, added up all of the years, across this  
16 model, for the interest on total debt, would that  
17 reflect the construction costs, the licensing—

18 A. Yes. It would indicate the interest that's  
19 being paid and the borrowed money to build the plant.

20 Q. Thank you and the—is there—

21 A. Again, I want to point out. This is not  
22 accounting for the capital cost. If there were no  
23 taxes, that line wouldn't even be in there. This is  
24 only for the tax calculation. This is an operating  
25 cash flow statement. It has nothing, at all, to do

1 with investment or the capital cost of the plant.

2 Q. Okay, that's fair.

3 A. As a matter of fact, you will see, down below,  
4 where I have subtracted the investment to get the fee.  
5 That investment includes all the debt, all the equity  
6 that was used to build the nuclear plant.

7 Q. So, that would be the line—just as I set this  
8 down—the line just before. NPV, I assume, is net  
9 present value?

10 A. That's correct.

11 Q. And PV operations, is that present value of  
12 operations?

13 A. That's correct. That's the discounted cash  
14 flow of all of those—where it says capital cash flow,  
15 just a few lines above those—

16 Q. Yep.

17 A. -that is all the cash flow that's being  
18 generated by the account.

19 Q. Under this scenario?

20 A. Yes, under this chosen scenario from the Monte  
21 Carlo loan.

22 Q. And, then, the line just in between those that  
23 you referenced, it says investment.

24 A. That's correct.

25 Q. And it's, roughly, eight billion.

1 A. For one plant, right.

2 Q. For one unit?

3 A. One unit.

4 Q. Okay, eight billion for one unit. That would  
5 be the estimate under this scenario of the cost?

6 A. Yeah, at this time, yes.

7 Q. Okay.

8 A. When this was done.

9 Q. And, under the various scenarios for the Monte  
10 Carlo simulation that you ran, did the investment line  
11 vary?

12 A. Yes.

13 Q. And, when you say that it varied, I assumed  
14 that, at times, it was more than 16 billion for both  
15 reactors?

16 A. Yes. It had varied because one of the  
17 uncertainties that went into the model is the  
18 constructed cost of the nuclear—or, the overnight  
19 capital cost or the constructed cost.

20 Q. That's exactly what I was trying to locate.  
21 So, do you recall the range, then, of the investment  
22 that you ran over the scope of the Monte Carlo  
23 analysis?

24 A. The overnight capital costs that we used were  
25 \$5,000 a kilowatt and it had a standard deviation of



1 \$500.00 a kilowatt. So, that produces—I wished I had  
2 it with me, but I'm going to estimate, now. That  
3 produces a range of overnight capital cost ranging  
4 somewhere from 6.2—I mean, sorry, \$6,200.00 a kilowatt  
5 down to about \$4,000.00 a kilowatt. That range is the  
6 range that the Monte Carlo analysis used, but it was a  
7 distribution that tended to favor the high side along  
8 with distribution.

9 Q. In other words, that it would be more likely,  
10 if we were doing confidence intervals, for it to fall  
11 on the higher end of that range of \$4,000 to \$6,200 per  
12 kilowatt?

13 A. Right.

14 Q. Okay and is it accurate to say that the main  
15 source of variation in that number has to do with the  
16 construction costs?

17 A. Yes.

18 Q. That's the major uncertainty variable in the—

19 A. Yes, the duration of the construction time  
20 determines the construction cost.

21 Q. You testified that if, at some point, using  
22 their option, that Blue Castle decided it was not  
23 economically feasible and walked away, in essence, that  
24 the water could revert to the previous owners, correct?

25 A. Yes, absolutely correct.

1 Q. But Blue Castle—so that I understand how the  
2 options work, Blue Castle, you also testified, would  
3 have 20 to 40 years to make that decision, right?

4 A. That is correct.

5 Q. That's the notion of being able to bank on the  
6 invested costs and, essentially, sit on the permit and  
7 decide whether you take it to the further step along  
8 your decision tree, correct?

9 A. That's correct.

10 Q. As part of your analysis—I don't know that you  
11 addressed it, specifically, today, but you did a  
12 levelized cost comparison of natural gas and nuclear,  
13 didn't you?

14 A. We do that routinely, yes. Again, I want to  
15 point out to you that we don't believe in LCOE.

16 Q. You don't what?

17 A. We don't believe in making decisions based on  
18 the lowest cost generating resource. Our company is  
19 dedicated, and my consulting firm, Energy Path, is  
20 dedicated to including risk and uncertainty because we  
21 believe it represents the way power markets work today.

22 Q. And the levelized cost analyses,  
23 traditionally, don't incorporate that, correct?

24 A. That is correct.

25 Q. But even if we took—and risk is, certainly, a

1 big component as we've talked about the nuclear  
2 development process.

3 A. Yes.

4 Q. Yes, but if-

5 A. As is every other resource.

6 Q. You could say that of any-yeah, that's fair,  
7 but if, comparing the levelized costs of nuclear and  
8 natural gas, which you've done, at the lower end of the  
9 confidence interval, I mean, natural gas is still going  
10 to be the lower option, right?

11 A. When?

12 Q. Well, we can refer to-I'm referring,  
13 specifically, to the analysis that you did.

14 A. Yeah. Well, then, you know that there is a  
15 substantial range.

16 Q. There is.

17 A. And those are real costs that you're looking  
18 at. They're not inflated dollars. Everything we do is  
19 in real dollars.

20 Q. These are real dollars and they're not  
21 adjusting for risk, correct?

22 A. No. You're not adjusting for the value of  
23 money.

24 Q. Okay and, in fact-

25 A. The risk is taken into account in the weighted

1 average cost capital.

2 Q. Okay, which would be included in the levelized  
3 cost analysis. So, within that, I think you were just  
4 saying that there was, certainly, a wide range for both  
5 nuclear and for gas levelized cost.

6 A. For gas. You can see the range, I think. I  
7 think I know what you're looking at. The range is  
8 substantial and it's because the volatility of natural  
9 gas is very high at thirty percent, historically.

10 Q. And if you take the mean, or the levelized  
11 cost, which is cheaper, for nuclear or natural gas?

12 A. Today, if we did just the LCOE, natural gas  
13 would be cheaper if you assume today's gas prices. If  
14 you do an LCOE analysis using natural gas inflation—I  
15 shouldn't say inflation—increases over the time, not  
16 necessarily.

17 Q. Did you take that into account when you  
18 calculated the probabilistic, levelized cost of natural  
19 gas? Is that including a forecast of natural gas  
20 prices?

21 A. Yes. It's a Monte Carlo analysis again.

22 Q. That is.

23 A. It takes samples of growth and the volatility,  
24 of the growth of natural gas and each run includes a  
25 natural gas curve.

1 Q. So, when you take the mean of that, that is  
2 taking into account the possible fluctuation due to  
3 future gas prices.

4 A. Yes.

5 Q. And you just testified that the mean for  
6 natural gas levelized cost under that analysis is lower  
7 than the mean for nuclear.

8 A. That's correct. If you don't take risk into  
9 account, that is exactly right.

10 Q. I understand. We're just looking at the  
11 levelized cost part of it—of your work. So, let's  
12 shift, then, a little bit to your testimony about  
13 natural gas prices increasing, the likelihood, and  
14 we've heard testimony, today, that, maybe, it's just  
15 uncertain. Your opinion is that they will increase,  
16 correct?

17 A. That is my opinion. That is correct. I have  
18 lived through—when we did the TIAC study, natural gas  
19 prices were so high that I couldn't get any of my  
20 colleagues to ever allow me to use anything less at  
21 that time and like six dollars a million, but here we  
22 are, in 2013, and we're down to three fifty and four  
23 dollars. So, I've learned that natural gas prices are  
24 very volatile and could turn on a dime and everything  
25 that's happening in this country right now, in terms of

1 portfolios, is not working for natural gas.

2 Q. You find, in your report, that the current  
3 historic lows for natural gas prices are due to two  
4 factors, primarily: one, the contribution of shale gas  
5 and, I think, within that, based on your testimony  
6 today, we would include any increase in supply. Is  
7 that a fair-through new technologies.

8 A. We are coming out of a recession. The demand  
9 for natural—we've had some warm winters. So, there's  
10 plenty of things that go into the demand for natural  
11 gas that determines its price. Keep in mind natural  
12 gas is the only commodity used in the electric utility  
13 industry that's a multi-use fuel. Coal isn't used  
14 anywhere but power. Nuclear—uranium is not used  
15 anywhere but nuclear, but natural gas has uses for  
16 home, residential heating, commercial heating,  
17 industrial processes, petro chemicals. So, there's  
18 competing demands besides electric utility demands.

19 Q. Sure.

20 A. So, all of those come into play to determine  
21 the price of natural gas and that's what makes it so  
22 unstable.

23 Q. You indicated, just now, that one of the  
24 reasons is some warm winters that we've had. Do you  
25 project increasing cold winters going forward?

1 MR. WRIGHT: Objection, Your Honor.

2 THE COURT: Why are you asking opinion?

3 MR. WRIGHT: He's not a climatologist.

4 THE COURT: I think the question was, probably,  
5 poorly put. I don't mean to denigrate the question,  
6 but I think what you need to do is ask him about his  
7 assumptions, if he has any. It's a foundational  
8 question.

9 MS. SWENSEN: Sure. We can do it that way. Sure.

10 Q. You just testified, and it's in your report,  
11 that one of the reasons that you believe that we're  
12 experiencing the current historic loads is warm  
13 winters, correct?

14 A. Yes. Well, no. No. I'm sorry. I shouldn't  
15 say that. One of the factors that can play into it is  
16 warm winters, but we do not do closed floor models. In  
17 other words, we would say, well, you know, here's the  
18 heating days that we project and, therefore, here's the  
19 price of natural gas. We aren't doing that at all.  
20 We're forecasting uncertainty. So, we don't know. All  
21 we know is this is the way it's behaved in the past  
22 and, if it behaves, in the future, in the same way,  
23 then, this is what's going to happen. We do not care.  
24 We don't care what's causing the price of natural gas  
25 to be what it is. All I know is how it has behaved in

1 the future and using that historic volatility to  
2 project into the future. So, I don't care what's going  
3 to happen.

4 Q. Mr. Graber, you, specifically, included, in  
5 your report, U.S. natural gas prices are, currently, at  
6 historic low levels owing to low demand (i.e., warm  
7 winter weather).

8 A. Yes. At the time I wrote that, natural gas  
9 was very, very low and one of the reasons it was said  
10 at that time, the time I wrote it, was because of warm  
11 weather. We had warm weather that year.

12 Q. That is my question, then. Is it part of your  
13 analysis of—you, earlier, opined, just a few minutes  
14 ago, that you believe that it is likely that natural  
15 gas prices will increase in the future, correct?

16 A. Yes.

17 Q. Is it part of your basis for that opinion that  
18 there will be a chance in the weather? It's a valid  
19 question based on why you state that there are current  
20 historical low levels.

21 A. Let me answer it this way. I believe, when  
22 you talk about weather, I believe that the weather is  
23 warming, if that's what you mean. I believe the  
24 weather is going to get warmer, okay? That's all I  
25 know about what the weather is going to [inaudible]



1 Again, I don't care, in my models, what's causing it.  
2 I may have written down, in there, what the factors  
3 were that caused the last winter, but over a 40 to 60  
4 year period, I have no way of knowing what the weather  
5 is going to be. I believe it's going to get warmer due  
6 to climate change and there's a lot of people that  
7 don't agree with me on that.

8 Q. And I understand you're not being presented as  
9 an expert on climate change going forward. I'm just  
10 trying to understand the bases for your opinion that  
11 they are likely to increase from their current low  
12 levels.

13 A. Yes.

14 Q. With the availability of increased supply,  
15 shale gas was discussed. I think fracking has also  
16 come up. Have you done any analysis comparing the  
17 potential increase in production to the potential  
18 increase in demand that you mentioned may come from  
19 increased exports to the international market?

20 A. No.

21 Q. No comparison of those two?

22 A. No.

23 Q. Okay. Is any part of your opinion about the  
24 economic viability of the project, taking into account—  
25 I understand the options model, but is any part of your

1 opinion based on the probability of climate change  
2 legislation?

3 A. Yes. We have put that as an uncertain  
4 variable within the Monte Carlo model. You do it by  
5 carbon taxes. You do it by the price of carbon. So,  
6 we estimate—we put it as an uncertain price of carbon.

7 Q. In your analysis, you assume that legislation  
8 is more likely after 2020 than before. Is that  
9 correct?

10 A. Yes. I think that legislation is going to be  
11 delayed on climate change.

12 Q. Why?

13 A. Lots of resistance. Lots of resistance to  
14 policies. We are moving very slow on policies  
15 regarding any aspect of global warming. The coal lobby  
16 and other organizations do not agree with me.

17 Q. You don't have any particular legislation in  
18 mind when you run your model, correct? Or do you?

19 A. No.

20 Q. You don't identify any particular cost  
21 attributable to future legislation, do you?

22 A. No and I want to point out that's the whole  
23 purpose of the real options. Because we are uncertain,  
24 we won't attach numbers. We just won't do it. We will  
25 put in the uncertainty in there, but we will not attach

1 numbers. We will not. That's why it's difficult to  
2 answer. I don't put numbers in unless they're non-  
3 variable.

4 Q. Uh-huh [affirmative], but there have to be  
5 some numbers in place. For example, you described that  
6 there's uncertainty as to the cost of construction,  
7 correct?

8 A. Uh-huh [affirmative].

9 Q. And, so, you run scenarios that would take  
10 into account various—a range of different costs for  
11 construction, correct?

12 A. Correct.

13 Q. Do you do the same type of range for potential  
14 climate change legislation, carbon tax?

15 A. Carbon tax, yes. I do.

16 Q. You did, okay. That's what I'm—so, you did  
17 attribute a particular cost attributable to future  
18 legislation. Do you remember that range?

19 A. I believe that range—let me just think a  
20 second. I believe that range went from \$8.00 per ton  
21 of CO<sup>2</sup> and I think I went up to \$16.00 per ton of CO<sup>2</sup>.

22 Q. How did you derive those numbers for your  
23 range?

24 A. That is an art, for the most part. Again, we  
25 could choose different numbers, but based upon my

1 belief that there is a resistance to put carbon taxes  
2 on, overall, I would stay at the lower end. That,  
3 basically, if you look at the [inaudible] IRP, they are  
4 using higher numbers than that, clearly, but that's the  
5 range, as an economist, I believe fits my—helps me  
6 sleep at night.

7 Q. So, a carbon tax would, essentially, in your  
8 opinion, help render nuclear more competitive as an  
9 option. Is that accurate?

10 A. Yes.

11 Q. Did you quantify how much government  
12 assistance would be necessary to render nuclear the  
13 preferable option?

14 A. When you say government assistance—

15 Q. A tax on carbon emissions or a subsidy, either  
16 one, whatever form the legislation that you are  
17 anticipating might take. I think I understand this,  
18 based on our previous discussion, but indulge me for a  
19 moment.

20 A. Oh, certainly.

21 Q. You described that you believe general  
22 marketing conditions for nuclear will improve after  
23 2020, right? But I understand that that is not  
24 necessary to you determining that this is economically  
25 viable in that it's just an option. Is that accurate?

1 A. Please repeat.

2 Q. Let's break it down because I should have.  
3 Part of your analysis, you indicate reasons that you  
4 believe general market conditions for nuclear will  
5 improve after 2020, right?

6 A. Correct.

7 Q. If they didn't, essentially, is what I'm  
8 asking, would that undermine, at all, your conclusion  
9 that this is an economically feasible project,  
10 economically viable?

11 A. It is possible that could happen, yes.

12 Q. Even though your option analysis would allow  
13 you to, essentially, drop it if things were not more  
14 favorable after 2020?

15 A. That's right.

16 Q. Why would it be not a viable option if you  
17 could still walk away?

18 A. Why would it not be?

19 Q. Why would it be—I'm sensing the tension here.  
20 You state that, if market conditions did not improve—

21 MR. WRIGHT: Objection. That's an improper  
22 comment. I don't want her commenting on my clients or  
23 my witnesses.

24 THE COURT: I don't know whose tension she's  
25 talking about.

1 MR. WRIGHT: Yeah, exactly.

2 MS. SWENSEN: I'm sorry. We can strike that.  
3 That's totally—my misunderstanding. I purely meant  
4 between my two things that I'm trying to understand.

5 Q. You've got the general market conditions. If  
6 they don't improve after 2020, you just told me that  
7 that could affect your conclusion that it's an  
8 economically viable project, right?

9 A. That is the basis of the real options model.

10 Q. But the poorly-worded tension that I was  
11 trying to identify, as I understood, that the beauty of  
12 the options model was that, if general market  
13 conditions did not improve, that Blue Castle could walk  
14 away.

15 A. Yes. When you say walk away, I think of  
16 walking away from an obligation. We're not going to  
17 walk away. We're going to make different management  
18 decisions and one of those is to cancel the plant.

19 Q. Decide not to invest further. Yes, okay.

20 A. Okay? And, yes, that is an option. That's  
21 why there's value in the plant because we have that  
22 option. That is the reason that we have value in the  
23 plant. So, we could cancel. We could delay. We could  
24 change scale. We could even, if we wanted to, change  
25 technologies.

1 Q. So, is your opinion more accurately couched  
2 that it is economically—and I think you actually state,  
3 at one point, that it's economically feasible to  
4 maintain the option, not necessarily that the project,  
5 itself, is economically feasible, correct?

6 A. That's right.

7 Q. And that takes into account that whether or  
8 not the market conditions that we've discussed, and  
9 others as well, improve, that the option would still be  
10 something that Blue Castle could exercise or not.

11 A. Yes. That's all we're doing is maintaining  
12 the option.

13 Q. Thank you. That's exactly what—I apologize  
14 for putting words in---

15 A. We're care taking it.

16 Q. Care taking, and we can, possibly, short-  
17 circuit some questions here, too.

18 A. That's fine.

19 Q. You have referenced, in your report, that the  
20 five sites currently under construction, and the recent  
21 PSC approvals of the nuclear sites being developed—or,  
22 nuclear units being developed, provide further support  
23 for your analysis, correct?

24 A. I'm sorry, but you said my report. I'm not  
25 quite sure what report you're talking about and, when

1 you say sites, do you mean the Vogtle and Summer sites?

2 Q. Good points. First, the report that you  
3 prepared for this case.

4 A. The testimony?

5 Q. Yes.

6 A. Yeah, okay.

7 Q. You considered the five sites under  
8 construction, correct? The five nuclear sites under  
9 construction, did you consider that as part of your  
10 analysis?

11 A. I don't know. I'm having a blank here. I  
12 don't know where I would do that. You could help me,  
13 perhaps.

14 Q. Sure. That's no problem. You have—we'll take  
15 it in two parts, actually. One, your opinion number  
16 three was that nuclear power plants are applying for  
17 and, in some cases, being granted licenses for  
18 construction and operation in the United States.

19 A. Right.

20 Q. Does that reflect your recollection as to—

21 A. Yes. I know what you're talking about.

22 Q. Okay. As you testify here, today, is that  
23 still a basis for your conclusion that it is an  
24 economically viable option?

25 A. Yes.



1 Q. And, similarly, you offered the opinion that  
2 state public service commissions have found recent  
3 nuclear plants offer power at competitive rates,  
4 correct?

5 A. Yes, in this case, after accounting for the  
6 risk.

7 Q. Is that still a basis for your conclusion  
8 today?

9 A. I think it supports. It's not a basis.

10 Q. Supports? So, in other words, if we went  
11 through—you've heard testimony earlier today, correct?

12 A. Yes.

13 Q. And there's been testimony about the number of  
14 plants that were de-commissioned this year, correct?

15 A. Yes.

16 Q. And there was additional testimony about at  
17 least a couple applications that have been withdrawn,  
18 correct?

19 A. Yes, COL applications.

20 Q. Yes. As I understand your testimony, that  
21 would not alter your conclusion, in any way, that the  
22 Blue Castle project is an economically viable option.  
23 Is that correct?

24 A. No. We're not the only ones using the options  
25 model. All utilities that presently have active COL's

1 are also behaving like, and we know because we talked  
2 to them, that they are using an options model as well.  
3 So, they are not committing to the construction of a  
4 nuclear plant. They're committing to completing the  
5 license and they will make their decision based on  
6 market conditions at the time that the license is  
7 granted.

8 Q. You mentioned two examples a moment ago,  
9 Vogtle and Summer, I believe, correct?

10 A. Yes.

11 Q. You've been following their progress--

12 A. Yes.

13 Q. -to some level? You're not personally  
14 involved with either?

15 A. I'm not an expert. I'm not an expert on that.  
16 I heard Dr. George, this morning, say things that I  
17 didn't know. I know—I've been following it because  
18 it's part of our industry.

19 Q. And it's part of the, as you said, support for  
20 it, though not necessarily a basis, your opinion that  
21 nuclear can be a competitive economic option.

22 A. Yes. Keep in mind that one of the primary  
23 motivations that enable the Public Service Commission  
24 to believe that a nuclear plant is the best option, in  
25 Vogtle's case, was portfolio analysis. They recognized

1 all the uncertainties the same as we do and it was on  
2 portfolio analysis the fact they had too much gas and  
3 this goes to power and light also. Way too much gas.  
4 They were overexposed and they believe that adding  
5 nuclear to their portfolio would stabilize their  
6 portfolios.

7 Q. Are you aware—please stop me when we get to  
8 the point where, as you said, you're not an expert and  
9 don't have knowledge, but are you aware of Vogtle's  
10 cost overruns that were discussed earlier today?

11 A. I am aware of them, but not as—I'm not—I don't  
12 know the figures as well as Dr. George does. I know  
13 they are overrunning and, again, from what I know, I  
14 agree with Dr. George as far as the figures.

15 Q. Were you familiar with recent statements by  
16 the Georgia PSC that, if they had to do it today, they  
17 wouldn't?

18 A. Yes.

19 Q. And that makes no impact to your conclusion?

20 A. No, it doesn't. Maybe, perhaps, I'm biased,  
21 but no. It does not. There have—nuclear plants are  
22 controversial. We're used to that and, when—anti-  
23 nuclear activists are very vocal and they can influence  
24 public service commissions and all you have to do is  
25 announce anything with those plants, at all, overruns,

1 even slight overruns, and there will be substantial  
2 pressure put on public service commissions because they  
3 are the ones that ultimately made the decision.

4 Q. But you testified that you're not aware of the  
5 extent of the cost overruns, correct?

6 A. I thought it was, I want to say, between three  
7 and five hundred million. Again, from when to when?

8 Q. And is that—I mean, you're not trying to  
9 belittle as something that just the anti-nuc activists  
10 have, as you said, any little change, they would jump  
11 all over?

12 A. No. I'm not belittling them at all. This is  
13 a democracy. They have the right to do whatever they  
14 want to do.

15 Q. Certainly. Let me ask it this way. Three  
16 hundred to five hundred million. In your mind, is that  
17 a significant overrun for a nuclear plant?

18 A. Not by historical standards.

19 Q. I'm sorry, not--

20 A. Not by historical standards.

21 Q. Explain to me what you mean by that?

22 A. Well, the cost of—we have had cost overruns in  
23 excess of three to five hundred million dollars.

24 That's all I mean by that. The—

25 Q. That it's not unusual, so to speak,

1 historically?

2 A. No. I would not call it unusual because these  
3 are first of a kind plants. I would not expect—  
4 actually, I thought—again, I shouldn't even say this.  
5 I shouldn't, but I thought that, the last I heard from  
6 Vogtle is they are now, slightly, on or had a schedule.  
7 That's what I've heard, that they are starting to get  
8 the project under control and that they are actually  
9 getting more on schedule.

10 Q. I just wanted one final point on Vogtle. You  
11 mentioned one aspect of it being not unusual, in your  
12 words, for it to be such a significant cost overrun is  
13 that it's new technology, correct?

14 A. First of a kind.

15 Q. You're referring to the reactor technology.  
16 Is that accurate?

17 A. Yes. Yes.

18 Q. And is that the same technology that Blue  
19 Castle has proposed to use for their reactors?

20 A. Yes. We are not going to break new ground on  
21 reactor technology. That is not our purpose. We will  
22 use proven standard and certified designs and we will  
23 learn from the reactors that precede us.

24 Q. And when you say proven, how many nuclear  
25 sites are you aware of that use the same reactor

1 technology?

2 A. Well, this is brand new technology. So, the  
3 AP1000 is being used—

4 Q. Just Vogtle?

5 A. -in the United States is being used at Vogtle  
6 and Summer and will be used in the next plant, which  
7 is, probably, the Turkey plant.

8 Q. That's the Florida construction. Is that  
9 right?

10 A. Yes. Yes.

11 Q. Do you recall writing an article for cost  
12 engineering in 2006?

13 A. Are you referring to the article that I wrote  
14 with Jeff Rothwell?

15 Q. Yes.

16 A. Thank you. That's what I remember.

17 Q. You recall writing that?

18 A. Those are early days of the real options  
19 analysis, yes.

20 Q. This was around the time—I don't want to  
21 misstate this, but around the time that you did the  
22 analysis in Texas, correct? It would have been shortly  
23 following.

24 A. Yes. Yes, it was because I think it's  
25 mentioned in there.

1 Q. It is and the timing is not entirely clear.

2 A. Yes.

3 Q. Okay and we referred to that earlier on. I  
4 think that was—is that with Energy Path that you did  
5 that or is that through a different company?

6 A. No. That was with Energy Path.

7 Q. Okay and let me hand you what's been marked as  
8 Exhibit [inaudible]

9 A. Thank you.

10 MS. SWENSEN [inaudible]

11 Q. Is this the article that we were referring to  
12 just now?

13 A. Yes.

14 Q. In this article, you calculated the net  
15 present value for a nuclear facility, correct?

16 A. Yes, as the static value.

17 Q. And we'll get to where you go from there. I  
18 don't want you to think that I'm going to take this out  
19 of context, but so that we can just set it up. You  
20 calculated the net present value for nuclear was  
21 negative two hundred and fifty-seven million. Is that  
22 right?

23 A. That's correct.

24 Q. And, when we say—so we're clear on negative  
25 net present value, you described that as meaning that

1 the negative value of the cash flow during construction  
2 would outweigh the positive cash flow anticipated  
3 during operation?

4 A. Correct.

5 Q. So, I have that correct, okay.

6 A. Yes.

7 Q. That's, essentially, the traditional net  
8 present value analysis, correct?

9 A. Correct.

10 Q. And, in fact, you did results of one thousand  
11 crystal ball simulations, correct?

12 A. Uh-huh [affirmative], simulations.

13 Q. And it was the results of that that found the  
14 mean net present value over those simulations was  
15 negative two hundred and fifty-seven million, correct?

16 A. That's correct. That's the starting point of  
17 any real options analysis is getting the base and mean.

18 Q. So, when you—that's what I think I wanted to  
19 get to. You opine that the solution to overcoming this  
20 enormous negative—my word, enormous, but negative two  
21 hundred and fifty-seven present value of new  
22 construction would be offering options, at various  
23 points in the project, to select not to do it. I'm  
24 trying to avoid saying walk away again, but to—

25 A. Yes.



1 Q. -choose another path.

2 A. Correct.

3 Q. Correct?

4 A. Right.

5 Q. And that's, essentially, the Blue Castle plan,  
6 correct?

7 A. Yes. This was one of the early models that we,  
8 ultimately, translated into the Blue Castle model.

9 Q. So, consistent with this model, Blue Castle  
10 would consider abandoning or choosing not to do the  
11 project at least—I want to say at least two points in  
12 time and given the examples that you made, tell me if  
13 I'm wrong, one would be after the ESP, yes?

14 A. Yes.

15 Q. Another could be if they moved further to get  
16 a COL?

17 A. Correct.

18 Q. Correct? And, then, further on, still, would  
19 be after construction.

20 A. Correct.

21 Q. And, as you and I discussed earlier, the  
22 further on you get, there's less uncertainty and more  
23 invested. Is that accurate?

24 A. Yes.

25 Q. In terms of cost that's been—

1           A. Yes because the uncertainties are resolving  
2 themselves.

3           Q. So, at the point where Blue Castle is, right  
4 now, in, sort of, that timeline that we discussed, the  
5 uncertainty for whether the plant actually goes into  
6 operation is at its highest, right?

7           A. It was actually at highest when we started—

8           Q. Day one?

9           A. —when we initiated. Today, we're further  
10 along. So, I would not agree with that.

11          Q. Would you agree that it's still high?

12          A. Yes and, incidentally, by the way, the higher  
13 the uncertainty, the more value we—our plan is more  
14 valuable the more the uncertainty.

15          Q. And when you say our plan, you mean the higher  
16 the uncertainty, the more the value there is to an  
17 option as opposed to sinking everything in?

18          A. Yes.

19          Q. Right, but—yes. And, in fact, you agree that  
20 nuclear plans represent one of the most largest and  
21 most uncertain investments, in your words, in the  
22 energy industry?

23          A. No. I can think of one that's even worse,  
24 carbon capture and storage, at this time, is even more  
25 uncertain and possibly even more expensive. I'm not

1 sure what it is.

2 Q. I think your words were one of the largest and  
3 most-

4 A. Oh, certainly, yes.

5 Q. Largest and most uncertain investments.

6 A. One of the, yes.

7 Q. If I misspoke, I apologize, but-

8 A. No. I think you spoke correctly.

9 MS. SWENSEN: That's all I have at this time.  
10 Thank you.

11 A. Thank you.

12 THE COURT: Ms. Valdes, any questions of this  
13 witness?

14 MS. VALDES: No. No questions, Your Honor.

15 THE COURT: Re-direct?

16 RE-DIRECT EXAMINATION

17 BY MR. WRIGHT:

18 Q. Rob, you used the phrase tax shield in talking  
19 about Exhibit 60.

20 A. Yes.

21 Q. Would you describe what you mean by that  
22 phrase?

23 A. Certainly. Where income taxes are valid, one  
24 of the tax savings-oh, let me state it this way.  
25 Interest is tax deductible.

1 Q. Right.

2 A. So, interest shields you from taxes so that  
3 your taxes are lower. So, there's a value to the  
4 interest tax shield.

5 Q. Right. That's what I wanted to get at is  
6 understand what you meant by shield. It just has, sort  
7 of, a negative connotation.

8 A. It shields you from taxes.

9 Q. Right, the same way your home mortgage does,  
10 home mortgage interest.

11 A. Exactly. Exactly. It shields you. You get  
12 a—that's right. You offset that against your income.

13 Q. Okay. You made a statement that wasn't  
14 followed-up on. I would like to follow-up on it. You  
15 said something to the effect that events in the United  
16 States, currently, are not working for or are not  
17 favorable for natural gas. Would you elaborate on  
18 that, please?

19 A. Yes, I will. That is an opinion, of course,  
20 and that opinion is based on the fact that coal plants  
21 are closing and they have to be augmented or they have  
22 to be replaced with natural gas plants and that is  
23 going on right now. Now, I will tell you that  
24 anywhere—and I've heard all these figures, but anywhere  
25 from 30 gigawatts to 100 gigawatts of coal plants are

1 the range of coal plants that could be shut down.  
2 That's 100 coal plants. That's 100 gigawatts. That is  
3 going to have to be replaced by natural gas. That's a  
4 demand for natural gas. I mentioned the LNG, the  
5 export markets. Those are going to be another demand  
6 for natural gas and there's a third one and I'll be  
7 darned if I can—

8 Q. That's okay. I think you made the point,  
9 nevertheless.

10 A. Yeah. I'm sorry, I had a senior moment there.

11 Q. Well, why is it that the recent plant  
12 closures, nuclear power plant closures, that fact does  
13 not cause you to change your opinion concerning this  
14 project's economic feasibility?

15 A. No. Simple. It all goes back to 1992 and  
16 this is not well understood. I don't know why we  
17 haven't got around to this. It's not well understood,  
18 but in 1992, a very significant act happened in the  
19 electric utility history. The wholesale markets for  
20 electric power were de-regulated by the Act and what  
21 happened, over that time, was—and not well known to  
22 most people—was that about seventy percent of the  
23 nuclear plants in this country were transferred to the  
24 energy subsidiaries of the regulated utilities so that  
25 they could make a lot more money in the wholesale power

1 markets which have become—so, whereas before, they were  
2 guaranteed a price by the Commission, they were  
3 guaranteed, they, now, have these nuclear plants down  
4 in power markets. They are subject to market forces  
5 and the marginal cost and what differs on the margin.  
6 So, they are, now, subject to fluctuating prices.

7 These new—Kewaunee and, for instance, Yankee are  
8 like that. So, they—

9 Q. And those are two of the ones that are  
10 closing.

11 A. Yes. They could have stayed, for instance,  
12 they could have stayed regulated plants and they would  
13 be made whole. In the wholesale power markets, now, it  
14 was originally, they were making a lot of money, but  
15 they are both very old, very small nuclear plants.  
16 They are higher cost nuclear plants to run. They don't  
17 have the economies of scale that a dual nuclear plant  
18 would have.

19 So, as a result of that, they are, now, subject to  
20 forces within these power markets and, in these two  
21 power markets, both the Midwest ISO, meaning  
22 independent system operator, and the New England are  
23 experimenting with capacity markets and these capacity  
24 markets are not functioning as they should. Those  
25 plants would have never shut down if the capacity

1 markets would have functioned as they wanted them to.

2 Q. Explain that. What is a capacity market?

3 A. The energy that you sell in a power market,  
4 dollars per megawatt hour, is almost all the recovery  
5 of energy in the plant—in the market. So, you bid into  
6 these markets, basically, to recover your cost of  
7 energy. Now, as higher cost resources get into these  
8 markets, you're sitting down here and you're making the  
9 difference, okay?

10 So, if you base everything on energy markets,  
11 then, when capacity gets short, the markets become  
12 unstable because there is—prices are being determined  
13 by one or two generators who can gain the market or  
14 keep capacity from the market. So, the purpose of the  
15 capacity payment is to make plants want to provide  
16 reserve capacity or secondary purpose is to make sure  
17 that adequate capacity is built.

18 This is a payment above and beyond the payment  
19 into the energy markets and they are not—it's more art  
20 than science at the present time and they have not done  
21 a good job of providing enough income to both of these  
22 high cost nuclear plants to keep them operating.

23 Q. So, then, back to the original question. In  
24 terms of the reasons—let me say it this way. It's the  
25 reasons why these plants are closing that cause you to

1 not alter your opinion about economic feasibility here.  
2 In other words, it's the unique factors that those  
3 plants are facing. Am I hearing you right?

4 A. Yes and low natural gas prices, today, are  
5 keeping electricity prices down. So, they are caught  
6 in markets that they, basically, are not making any  
7 money. In fact, they are losing money and that's as  
8 much a factor of power market design as it is the cost  
9 of operating these nuclear plants.

10 Q. All right and how is it that those factors  
11 wouldn't affect or be in play for Blue Castle?

12 A. How would they not be?

13 Q. That's right. If they are affecting these  
14 other, older plants that you are talking about, Vermont  
15 Yankee, for example, why wouldn't those same forces put  
16 the same pressure on Blue Castle or any other nuclear  
17 plant, right now, for example?

18 A. We are a company. We are entrepreneurs.  
19 That's a risk we take. That is one of the risks we  
20 assume.

21 Q. And, so, that plays into the options that you  
22 have as you continue to take the steps through the ESP.

23 A. Right. If we were to build those plants  
24 today, we would be subject to all of the forces that  
25 would come upon us in the future. The real options



1 model allows us to wait and see how things are  
2 developing before we make the final investment or sell  
3 the option to the ultimate buyer and, so, in so doing,  
4 we prevent—or, at least have a better idea of what  
5 power markets are going to look like but, again, I want  
6 to point out that we are not going, ultimately, to  
7 operate the plant. We have a stake, perhaps, but we  
8 are not going to be operating it.

9 Q. Right. Okay.

10 MR. WRIGHT: That's it, Your Honor. Thank you.

11 THE COURT: Cross on those things?

12 MS. SWENSEN: I have nothing further. Thank you.

13 THE COURT: You may step down. Thank you, Mr.  
14 Graber. I appreciate your time. Next witness, Mr.  
15 Wright?

16 MR. WRIGHT: Yes, Your Honor. We call Mr. Kent  
17 Jones.

18 THE COURT: Mr. Jones? Come forward, Sir, and  
19 raise your right hand and be sworn.

20 KENT JONES called as a witness by the defendants,  
21 being first duly sworn, was examined and testified on  
22 his oath as follows.

23 THE COURT: You may have a seat in the witness  
24 chair, please, Mr. Jones.

25 DIRECT EXAMINATION

1 BY MR. WRIGHT:

2 Q. Mr. Jones, tell us your full name.

3 A. Kent Leroy Jones.

4 Q. And you are the current State Engineer for the  
5 State of Utah?

6 A. I am.

7 Q. Tell me what that job requires of you?

8 A. The job is an appointed job by the Governor.  
9 It's a four-year appointment that gives me the  
10 assignments to administer, manage, apportion,  
11 distribute the waters of the State of Utah. As such,  
12 we spend time going around the state, making sure  
13 people are taking water in an appropriate manner. We  
14 have 35 river systems that we have river commissioners  
15 on that we set head gates. We put water in the  
16 ditches. We regulate water based on a priority basis.  
17 If water runs short on those systems, we look at  
18 ground water basins, try to manage them to keep them  
19 within safe yields to make sure that the rights aren't  
20 impaired there. We process applications for applicants  
21 who come in and want to use new water or to change  
22 existing water rights to different areas and we look at  
23 those applications. We try to do the best we can to  
24 allow people to put the waters of the state to  
25 beneficial use because I think that's our charge to do

1 that.

2 In addition to that, we have the responsibility to  
3 make sure the rights of others are protected.

4 Q. So, you've got that balance about  
5 appropriating new water, wherever that's available, or  
6 changing the use of existing water rights while looking  
7 at local impairment—or, local interference, I should  
8 say, to make sure that, if someone wants to use water  
9 somewhere else, they're not going to affect senior  
10 users who are already there?

11 A. That's correct.

12 Q. Would you describe your experience with—I'm  
13 dispensing with a lot of your background and stuff  
14 because the statute says, sort of, what you have to be.  
15 You've got to be an engineer and we can all agree that  
16 you're qualified to do what you do because you're doing  
17 it. Talk about your particular experience, both before  
18 you became a state engineer and since, with the  
19 Colorado River Basin, generally, the Green River,  
20 specifically. What kinds of projects have you been  
21 involved in, water uses out there in that basin?

22 A. Prior to becoming State Engineer, I was  
23 actually Assistant State Engineer for Applications and  
24 Records for about 21 years. As such, I was the State  
25 Hearing Officer and had the opportunity to travel

1 around the state and hear issues before the State  
2 Engineer on water applications and, so, we got into the  
3 Colorado River and Green River drainage areas to hold  
4 hearings, frequently, to talk about water issues out  
5 here, about what can be done and made recommendations,  
6 then, based on those hearings after working in  
7 consultation with the regional offices to make  
8 recommendations to the State Engineer for action on  
9 those proposals.

10 Q. Now, when this application—these two  
11 applications, the Kane and San Juan applications were  
12 first filed, tell the Court, when you get an  
13 application, and let's separate these from, maybe,  
14 something where a farmer wants to irrigate an  
15 additional hundred acres. We're talking about a rather  
16 significant application and a significant amount of  
17 water. Would you agree with that?

18 A. Yes.

19 Q. On these applications?

20 A. Yes.

21 Q. When these came in the door, you know, would  
22 you describe, sort of, how you and your staff  
23 approached an application involving this kind of an  
24 industrial or power use and, particularly, this amount  
25 of water? How do you attack it?

1           A. Well, I was asked by a news reporter that  
2 isn't this just a really significant application, but  
3 my response, at that time, was this is just another  
4 application. It is for a large amount of water, but we  
5 have a process that we have to go through to review  
6 these applications and each of these applications  
7 require that they are accurately completed on a form  
8 prescribed by the State Engineer. They have to be  
9 advertised and have public notification. So, we put  
10 that through the public notification process.

11           We went through a period of protest time and  
12 received protests. We had an administrative hearing on  
13 these files because of the protests. We met and had  
14 some discussions with those people who wanted to be  
15 parties and expressed concern, along with the  
16 applicants, and, kind of, went through that process.  
17 So, they are typical applications and typical  
18 processes, but there are a lot of people involved and  
19 it's a significant amount of waters.

20           Q. Now, the decisions that you made for both of  
21 these changes refer to a number of sources. They are  
22 footnoted and referenced in the text. Would you just  
23 summarize for us the general nature of the sources you  
24 look to to determine the issues required of you by the  
25 statute? Section 73-3-8 is the one I'm referring to,

1 in particular, which, kind of, as you know, contains  
2 kind of a laundry list of items you go through. Where  
3 did you look to to begin your analysis on these  
4 applications?

5 A. Once we have the administrative hearing, our  
6 responsibility, at the first point for the first  
7 action, is the regional office will start doing an  
8 investigation and review. They'll take the information  
9 from the hearings and look through that information  
10 that we received, and we did information at the  
11 hearings and we received subsequent information, after  
12 the hearings, that came in to be part of the record.  
13 So, we evaluate those. We go through the criteria in  
14 the statute to see if we have answers to those specific  
15 criteria that we have responsibility to make a decision  
16 on.

17 There were some questions about nuclear power we  
18 wanted to investigate and we did some research and  
19 looked at some statutes regarding that and regulations  
20 for nuclear power and water use associated with that.

21 We looked at water flow information on the Green  
22 River about where the proposed point of diversion was.  
23 So, we looked at data associated with that.

24 Q. Did that include the USGS gauge, for example,  
25 at Green River?

1           A. It did, yeah. We, specifically, looked at  
2 that gauge and the river flow that was at the Green  
3 River gauge to try to make a determination as to how  
4 much water would be available at that point of  
5 diversion.

6           Q. Now, the water rights at issue had been  
7 previously approved for use at a proposed coal-fired  
8 power plant. Is that correct?

9           A. That's correct, but the two applications were  
10 for different—

11          Q. Sorry, two different ones.

12          A. Two different plants, that they were approved  
13 previously. So, the State Engineer, back at the time,  
14 in the '60's, looked at those applications and reviewed  
15 them under that same criteria and made a decision that  
16 those applications should be approved at that time.

17          Q. And how did that prior approval—so, when those  
18 water rights came to you, then, for analysis for this  
19 project, how did that prior approval factor into your  
20 analysis?

21          A. Well, the Colorado River drainage, right now—  
22 Utah has been allocated a certain amount of water under  
23 the Upper Colorado River Compact and Utah's allocation  
24 represents about twenty-three percent of the water  
25 availability on the Upper Basin and we start looking at

1 the amount of water that's there and, over time, we've  
2 actually approved more applications for use in the  
3 Upper Basin than Utah's allocation. So, we're over-  
4 appropriated, on paper, but, yet, we're not using all  
5 of that water. We're only using about one million acre  
6 feet and we're entitled to about 1.4 million acre feet  
7 and, so, we started to look at that information there.

8 These applications were already approved and were  
9 part of that water that's already been approved, but  
10 not used and, so, we made the decision, because we are  
11 over-allocated, that we were not going to approve any  
12 new, larger, permanent applications in the Colorado  
13 River Basin. We're still approving some small  
14 domestics and we've got isolated homes that need water.  
15 We still approve some of those, but we are not  
16 approving new applications and, so, these represented  
17 applications that were already approved in the Colorado  
18 River Basin.

19 So, we looked at those a little bit differently.  
20 They're already approved and already a part of what  
21 we're accounting for in the Basin.

22 Q. So, it didn't represent a new appropriation of  
23 water that hadn't already been, sort of, accounted for  
24 as part of Utah's Colorado River allocation?

25 A. That's correct. It was already in our list of



1 water rights that we've already approved.

2 Q. Sort of already in the water budget?

3 A. Yes.

4 Q. Would you open the binder in front of you and  
5 take a look at Exhibit 2? Are you there?

6 A. The order of the State Engineer?

7 Q. Yes.

8 A. Yes, okay.

9 Q. And this is the order approving the San Juan  
10 portion of this project, correct?

11 A. Yes, it is.

12 Q. Turn to page 4. A couple of statements made.  
13 The second paragraph begins to date, the Upper Basin  
14 states have met all of their downstream obligations  
15 under the compact and law of the river. The Compact,  
16 of course, is the Colorado River Compact?

17 A. That's right.

18 Q. And what's the law of the river?

19 A. The law of the river is, basically, how the  
20 river is administered, okay? It's based on those  
21 compacts about how we're going to divide the water  
22 between the Upper and Lower Basin and just how that  
23 system works.

24 Q. Okay. Now, the next statement is that it is  
25 estimated that Utah water users currently deplete

1 approximately one million acre feet annually, which  
2 represents an underutilization of Utah's share of the  
3 Colorado River allocation. That's based on, I assume,  
4 totaling-up all the applications and looking at what is  
5 actually being used versus what has been approved.  
6 That's the difference of this over-appropriation that  
7 you talked about.

8 A. That's correct. Yeah. We're actually looking  
9 at the beneficial uses of water under the approved  
10 applications to make a determination on how much water  
11 is being depleted, then, by those uses and we're  
12 calculating that to be just slightly over a million  
13 acre feet.

14 Q. And how is that determined? How do you  
15 determine how much is actually being put to use?

16 A. It's done through—the Division of Water  
17 Resources actually helps us in that area where they  
18 will go out and actually map areas, aerial photos, and  
19 they pull together information about where water is  
20 being used. We'll look at water rights associated with  
21 municipalities. We have water use records. So, we  
22 just pull together a whole bunch of sources, but we  
23 look at a lot of aerial photos and see how land is  
24 actually being irrigated or what types of use we see on  
25 the lands.

1 Q. Okay. The next statement is that the  
2 underlying water right associated with the changes and  
3 approved appropriation that has not been developed.  
4 That's the use for a coal-fired plant that we talked  
5 about?

6 A. That's correct.

7 Q. And, then, the next one is approval of this  
8 change application does not constitute a new  
9 appropriation of water within the Colorado River Basin  
10 although it does constitute a new diversion demand on  
11 the Green River which is part of that basin. Would you  
12 explain what that statement means?

13 A. What that means is that the Green River  
14 actually flows its tributary to the Colorado River and  
15 there are several tributaries that come into the  
16 Colorado and Green River systems that form the Colorado  
17 River drainage and that indication, there, is that,  
18 inside that Colorado River drainage, this application  
19 is an approval within that drainage area, but because  
20 of its points of diversion, which are on the lower part  
21 of the system in that Colorado River drainage, that it  
22 doesn't have an impact, presently, on the Green River.

23 Q. Let's talk about the criteria for approval of  
24 a change application and this criteria applies,  
25 statutorily, to all changes. It doesn't matter what it

1 is.

2 A. That's right.

3 Q. The first is that—whether the proposed use  
4 will impair existing rights or interfere with the more  
5 beneficial use of water.

6 MR. WRIGHT: Your Honor, I'm quoting from 73-3-8  
7 and its sub-parts.

8 Q. Kind of speaks for itself. I think you've  
9 talked about that. The idea is, will one water user's  
10 use or diversion impair or affect another. I mean,  
11 that's, sort of, what all that means, correct?

12 A. Yeah. Yeah, that's correct.

13 Q. Okay and what about the idea of the more  
14 beneficial use of water? How do you weigh whether one  
15 use is a more beneficial use than another?

16 A. There's not, really, a good definition in  
17 statute about what is the most beneficial use or a more  
18 beneficial use of water. I think there's a case,  
19 Tanner v. Bacon, that talks about domestic might have  
20 the best priority, with irrigation following after  
21 that, as far as a preferred beneficial use of water,  
22 but there's nothing really in the statute and, so,  
23 normally, we will just look at applications based on  
24 priority date, based on as they come before us, as we  
25 look at those applications and don't give a lot of

1 preference to the actual type of use that's theirs.

2 Q. Was there an issue about the more beneficial  
3 use on these particular applications, the Kane and San  
4 Juan applications? Let me ask it this way. Was there  
5 a claim by, say, a protestant that there was some more  
6 beneficial use that should be considered?

7 A. I think it was brought up that there might be  
8 better uses for this. There might be more beneficial  
9 use, for people use or other use, other than putting  
10 this water to use in a power plant.

11 Q. And how did you evaluate that?

12 A. Yes. My assessment, it was already approved  
13 for power plant development. It was already committed  
14 to be that. It was already assigned a beneficial use.  
15 We, currently, didn't have any other competing  
16 applications for that amount of water for that type of  
17 use in that area and, therefore, it was not an issue of  
18 is there a more beneficial use of water for which to  
19 put this to.

20 Q. Okay. I skipped over to, specifically,  
21 referring to the statute we talked about already, the  
22 issue of unappropriated water, which is we're over-  
23 appropriated on paper, but under appropriated at least  
24 in terms of actual use. So, I think I've addressed  
25 that.

1           Subsection 3 is that the proposed plant is  
2 physically and economically feasible unless there's an  
3 exception for Bureau of Reclamation projects, but let's  
4 talk about physically feasible. How is that standard  
5 applied by you and your staff?

6           A. Well, as we look at applications for physical  
7 feasibility, we will look for typical things that are,  
8 maybe, in that same kind of category. Is this  
9 something that has been done or can be done and we  
10 looked at the industry. There are other nuclear power  
11 plants that are there, in existence, that are operating  
12 and we're just of the opinion, well, physically, it's  
13 got to be possible because it's done. We look at  
14 diversions on the river. It's physically feasible to  
15 be able to put a diversion on the river, to be able to  
16 pipe water over to the power plant. Other power plants  
17 have been built and, therefore, it seems to meet that  
18 standard that it would be physically feasible.

19           Q. So, it's not some sort of crazy, nobody's ever  
20 heard of, kind of use for the water. It's putting  
21 water in a power plant to generate electricity, which  
22 has been done before.

23           A. That's the way we looked at it, yes.

24           Q. So, let's use an extreme example. If somebody  
25 wants to irrigate ten acres, but they want to do it on

1 a slope that's, you know, 30 degrees or something, is  
2 that something you would look at and say you can't  
3 irrigate a 30 degree slope? That's just not physically  
4 feasible.

5 A. Unless you're in Peru. There are ways that it  
6 could be done, but we would come back and have them  
7 explain to us, okay. How? And there would have to be  
8 a series of lateral ditches and drop structures. I  
9 mean, there are ways—

10 Q. Sure.

11 A. -but we would have to come back to how can you  
12 even do that and we would ask that kind of a question.

13 Q. Okay. Let's talk about economic feasibility.  
14 How, on these particular applications, and  
15 applications in general, how do you apply or look at  
16 that test?

17 A. We would look at that. We would ask questions  
18 and a lot of this information, generally, would come  
19 out of the hearing about how are you actually going to  
20 be able to do this and, actually, to be able to  
21 construct the project, to be able to construct the  
22 diversion works and the facilities to get the water to  
23 the project and, then, to actually be able to do that  
24 project and, so, a lot of the applications we have come  
25 before us are fairly routine things that—I mean, if

1 somebody wants to build a home and put in a quarter  
2 acre of irrigation, or something, we don't think too  
3 long about that.

4 Q. About economic feasibility of that?

5 A. Right.

6 Q. Okay.

7 A. Yeah and, so, they should be able to  
8 accomplish that. Other people can do that in similar  
9 circumstances. When we get to larger-type projects, we  
10 would look, generally, at what's being proposed. We  
11 would ask questions about how are you going to be able  
12 to do this, take care of it. In these specific  
13 applications, the information came before us that they  
14 are working on an early site plan; that money had been  
15 expended into the millions of dollars; that they were  
16 paying bills and going through a process to get things  
17 developed; that they had a plan to go to investors and  
18 get investors' money to come in and help that develop  
19 that project and be able to go out, as they move  
20 through the phases, to be able to get additional  
21 investors to be able to earn and get enough money so  
22 they could actually build the whole project and that  
23 seemed to be a reasonable plan for how things could be  
24 developed of this nature. We don't expect applicants  
25 to have all the money in their pocket at the time they



1 file the application, on these larger applications, but  
2 they do need to have a reasonable plan to be able to  
3 come up with funding sources to make sure that it's  
4 economically feasible to accomplish that.

5 Q. And what impact did the fact that Blue Castle,  
6 at the time of the hearing on this matter, had already  
7 spent—I don't remember what the amount was then, but  
8 several million dollars, a few million dollars, the  
9 fact that that money had already been spent, which is  
10 not an insignificant amount. How did that play into  
11 your analysis?

12 A. It, actually, had a significant impact on—for  
13 a showing that there was a definite desire to do the  
14 project. There was a need and a drive to be able to  
15 accomplish what was being proposed. We knew that money  
16 was being expended. We knew that people were getting  
17 paid and work was going ahead. Significant studies,  
18 engineering studies and site work were being  
19 accomplished. It gave us the impression and the  
20 understanding that this was a viable project, moving  
21 ahead, realizing it would have to go through a staged  
22 money-gathering process in order to be able to  
23 accomplish the whole thing, but it gave us a lot of  
24 confidence to be able to look at that and say, well,  
25 yeah. There is a viable project here.

1 Q. And, in terms of the ultimate product to be  
2 produced, which is electricity, did you look at issues  
3 about is there a demand for power? Is there even a,  
4 you know, is there going to be a usefulness for this  
5 plant should it ever be built?

6 A. And that would be a critical part. Propose  
7 they do the project, build the project and, then, what  
8 do you have? We did look at that and we looked at  
9 increasing demands and projections that additional  
10 power was going to be needed in Utah and in the U.S.  
11 We looked at, if the power plant was built and  
12 constructed and generated power, that there was going  
13 to be a demand and a need for power in the future. So,  
14 that played into that, too.

15 Q. All right. Now, nuclear power plants, as you  
16 have heard and you, probably, knew already, to actually  
17 build one is a very expensive proposition. Does that  
18 undermine the economic feasibility, as you see it, when  
19 someone is simply asking to use the water to start the  
20 project?

21 A. I don't think that undermines it and how we  
22 looked at that was, you know, has somebody else done  
23 this. Are there plants out there? Was somebody able  
24 to accomplish this same kind of a task and the answer  
25 to that was yes. There are other plants that are out

1 there. There are plants that are developing—that have  
2 developed and are generating power and are marketing  
3 power through these power plants and, so, we felt  
4 pretty confident that there are ways that this can be  
5 done.

6 Q. In other words, nuclear power is a proven  
7 technology, a proven commodity?

8 A. It is.

9 Q. The next feature under that same subsection  
10 asks about whether the application would prove  
11 detrimental to the public welfare. How did you review  
12 these applications under that test?

13 A. Public welfare, there's not a well-defined  
14 term about what that actually means, but I think of  
15 that as the health, safety and well-being of people and  
16 the needs of the people and what is important there and  
17 we looked at can water be diverted. Can it be put in  
18 the pipeline? Can it go to the project and be used and  
19 still keep people safe?

20 We actually had a meeting with the Nuclear  
21 Regulatory Commission representatives and talked to  
22 them about that and they talked to us about the  
23 stringent process that they have to go through to make  
24 sure everything is safe and it's in compliance with  
25 federal standards and it's a federally mandated,

1 federal regulated industry that has to go through that  
2 process and they will assure that.

3 I also looked at issues like people need power.  
4 We're a power hungry nation. We like power. We're  
5 very energy dependent. Energy plants create jobs and  
6 they help bolster other jobs to provide power to be  
7 able to do other kinds of things and, so, in looking at  
8 that, we just felt there are a lot of positives about  
9 public welfare issues there that we didn't see that it  
10 was going to be detrimental to the public welfare as  
11 long as it was constructed properly and met all of the  
12 standards and requirements.

13 Q. Did it concern you that the applications were  
14 filed and, now, approved relatively early in the  
15 process; which is to say Blue Castle is a long way,  
16 still a few years out, from an approved ESP which,  
17 then, could be further out from an approved COL,  
18 combined operating license and, then, further out from  
19 an actual constructed, built plant. Did that timeline  
20 cause you concern about public welfare or beneficial  
21 use, for that matter?

22 A. It did not. In fact, as I thought about that,  
23 if you can't get water lined-up to do these projects,  
24 you're going to have a hard time doing these projects  
25 and, therefore, I would guess it would have to be one

1 of the early phases that try to get things lined-up to  
2 make sure you've got that resource so you can use it so  
3 that you can move through your other processes and get  
4 the permits you need.

5 Q. And what is your understanding about the  
6 status of those water rights in this interim, while  
7 Blue Castle continues to develop the site and work on  
8 the ESP?

9 A. These water rights are actually held in the  
10 name of the Kane County Water Conservancy District and  
11 the San Juan County Water Conservancy District. They  
12 are classed as public water supply agencies at the  
13 state, public water suppliers and, as such, the water  
14 rights that they hold for the first 50 years of the  
15 application approval is considered diligence and  
16 reasonable cause for delay for holding that to meet the  
17 reasonable future needs of the public and, so, those  
18 water rights are in good standing.

19 Now, both of these water rights are coming up on  
20 their 50-year time periods, but we give each water  
21 right holder an opportunity to be able to submit proof  
22 to us that they put water to beneficial use and we,  
23 periodically, will send notices to people and say it's  
24 time for you to submit proof that you put the water to  
25 use or file an extension to show why you haven't done

1 that.

2 Public water suppliers have a special exemption,  
3 under Utah statute, to be able to get extensions based  
4 on diligence or reasonable cause for delay, which is  
5 the criteria we have to judge, under statute, to get  
6 these extensions to move to the 50-year time period.  
7 The statute has also been amended to indicate that  
8 these public water suppliers have the option to be able  
9 to get extensions beyond 50 years under certain  
10 conditions. One is that they've constructed the works  
11 and just haven't put the water to use. It says we  
12 shall grant extensions beyond the 50-year time period.

13 It also says that, if they have constructed the  
14 works, not put the water to use, but still need that  
15 water to meet the reasonable future needs of the  
16 public, which is a 40-year projection, it says we shall  
17 grant the extensions past 50 years on that and it says,  
18 if they haven't constructed the works, but they can  
19 still show that they need the water to meet the  
20 reasonable future needs of the public, which is  
21 projected out to 40 years, then, it gives the option to  
22 the State Engineer. It says we may grant extensions on  
23 those applications and we have had several applications  
24 go through that 50-year period for public water  
25 suppliers and, as long as they can show us, in their

1 engineering reports, that there is a need for that  
2 water which would benefit, then, the people within that  
3 public water supply system, we have been granting those  
4 applications.

5 Q. Okay. The next part of the test is that the  
6 applicant has the financial ability to complete the  
7 proposed works. Would you describe how that factor is  
8 evaluated—or, how it was evaluated on these  
9 applications?

10 A. The financial ability, and I talked about  
11 that, a little bit, on the economics, but we looked at  
12 the monies that were available, monies that were being  
13 expended. We looked at the plan, actually, to be able  
14 to accomplish this project and what they were proposing  
15 to do and it appeared they were lining-up investors and  
16 that they were going to be able to go through a  
17 business process to do an initial phase, get that taken  
18 care of, obtain additional funds and just keep moving  
19 through that process until they were able to complete  
20 that project which, in my mind, makes some sense about  
21 how you have to do a project like that. Again, I  
22 mentioned we don't expect applicants to have the money  
23 in their pockets at the time they file the application,  
24 but they have to have a reasonable plan to be able to  
25 do that.

1 Q. Okay. The next portion of the test is that  
2 the application was filed in good faith and not for  
3 purposes of speculation or monopoly. In your mind, do  
4 you separate those two? It's in the conjunctive, good  
5 faith and not for purposes of speculation or monopoly.  
6 How do you evaluate those?

7 A. When we look at that, it's a pretty fine line.  
8 I think that they are very closely tied and what  
9 we're—again, our job is to make sure that the waters of  
10 the State are put to the most beneficial use and give  
11 people who need the use of water to have the  
12 opportunity to do that as much as they can and, so, the  
13 statutes, early on, don't just let people go out and  
14 take water, hold it and not use it, thereby creating a  
15 monopoly so that they own all of the water. Then,  
16 people would have to deal with—

17 Q. Have to come to them to get it.

18 A. —deal with that one entity, yeah. They only  
19 can do that or, if they're trying to tie this up and  
20 don't really have a purpose for the water, which I  
21 think is what the speculation gets into, that they're  
22 just trying to tie it up and don't really have a  
23 beneficial use for the water, which really ties, very  
24 closely, to try to monopolize that water resource and  
25 not let other people use it.



1 Q. Have you seen applications, in your career,  
2 where you thought this is speculation?

3 A. There have been some that have come before us.  
4 We had a major one on the Jordan River/Utah Lake  
5 system, that was actually filed a few years ago, where  
6 they had identified, through their engineering studies,  
7 excess water they felt was in the system and filed an  
8 application to appropriate the water that was there.  
9 They didn't have a use for it, but they said we want to  
10 appropriate all this water and, then, we're just going  
11 to—we're going to sell it to cities, or whoever wants  
12 to buy this water from us, because we've identified it.

13 As we went through there, the waters of the Jordan  
14 River and Provo River, Utah Lake and that system were  
15 all fully appropriated as of a long time ago. Some of  
16 the waters aren't being used, currently. They are  
17 under non-use applications, but because the applicant  
18 didn't have any proposal for what—they didn't have any  
19 contract with anybody, no proposal as to how they were  
20 actually going to use the water, where it was going to  
21 be delivered, we felt like that was a fairly  
22 speculative application and, as a result, that  
23 application was rejected.

24 Q. And you're referring to it was an application  
25 filed by Western Water/

1           A. Western Water. That's the one I'm talking  
2 about, yes.

3           Q. The next portion of the statute talks about  
4 natural stream environment. It, kind of, combines the  
5 two: public recreation or natural stream environment.  
6 Let's talk about—let's just break it up—public  
7 recreation. How did you look at these applications  
8 under that test?

9           A. And the way we looked at that, all these  
10 waters used for public recreation and the answer that  
11 we came up with is yes, they are. There's floating.  
12 There's fishing. There's things that happen on the  
13 river that is a source of recreation and, so, then, we  
14 went back and looked at the flows of the river and  
15 looked at what taking seventy-second feet of water out  
16 of that river would actually do to the river and it was  
17 our opinion, it was such a small percentage of the flow  
18 that would be coming out, even under low flow  
19 conditions, that we just didn't see that it was going  
20 to cause any impact to the recreation along the river.

21           Q. Okay and—I'm sorry, natural stream  
22 environment.

23           A. Natural stream environment actually goes right  
24 along with that, too. We know there are critical  
25 issues, endangered fish in the river, critical habitat

1 areas that we have to be careful with and have to be  
2 dealt with, but we're of the opinion that that amount  
3 of water coming out of the river, for how much water is  
4 actually there, was going to be such a small amount  
5 that it just would not cause a problem.

6 Q. Even in times of low flow?

7 A. Even in times of low flow.

8 Q. How has the, if at all, the re-operation of  
9 Flaming Gorge Dam—were you here for Jerry Olds'  
10 testimony?

11 A. Yes, I was.

12 Q. You heard him talk about the record of  
13 decision, I believe it was 2006, and the Bureau of  
14 Reclamation's determination to re-operate Flaming  
15 Gorge. How did that influence your analysis of these  
16 applications?

17 A. There are some critical considerations with  
18 these applications and moving into the Green River,  
19 knowing that we've got some endangered species that we  
20 need to protect. The re-operation of Flaming Gorge set  
21 up, for a couple of reasons—I mean, it was based on a  
22 biological opinion offered by the Fish and Wildlife  
23 Service in stating a range of flows that they're  
24 recommending that should be in the river to help  
25 maintain and to help sustain the endangered fish that

1 are in the river system.

2 The 2006 record of decision that was issued  
3 indicated that the reservoir would be operated in such  
4 a manner that it would work to protect those endangered  
5 fish flows, the recommended flows, plus it would allow  
6 for states to be able to develop their compact  
7 allocations under the Compact and, so, since 2006,  
8 they've been trying to work to get, then, releases to  
9 try to match those flows coming into the river.

10 I noticed, for the last couple of years, and  
11 they've been pretty bad, dry years, that the flows in  
12 the river have stayed—it looked like, just looking  
13 quickly, somewhere between 1,100 and 1,500 cubic feet  
14 per second flowing through the Green River Gauge, which  
15 is really good for a very dry year. So, they're  
16 working on the operation and the releases coming out of  
17 the reservoir to try to keep those flows through the  
18 river at a level where they feel like the Fish and  
19 Wildlife Service is going to support that and it's  
20 going to help sustain the fisheries.

21 Q. Are there any minimum stream flows that have  
22 been imposed on the State of Utah in the Green River  
23 that have to be met?

24 A. There was the biological opinion issued by the  
25 Fish and Wildlife Service that made some

1 recommendations. To this point, there's nothing that's  
2 been imposed saying that we have to do that. They've  
3 recommended a minimum flow of 1,300 second feet of  
4 water coming down through the Green River area.

5 We are working with the Fish and Wildlife Service  
6 and with the water acquisition committees and other  
7 groups to try to come up with a plan on how this is  
8 going to work because we realize that we still need to  
9 develop water in Utah. We're, currently, depleting  
10 over a million. We need to go up to about 1.4 in order  
11 to get our whole allocation and we realize that the  
12 Green River is one of the major sources of water  
13 through Utah that needs to be utilized, and will be  
14 utilized, to help us meet those demands.

15 So, we've been meeting with these groups. We have  
16 a Flaming Gorge technical working group that meets  
17 through the year and annually makes a recommendation to  
18 the Bureau of Reclamation on, maybe, how flows ought to  
19 be released. The Fish and Wildlife Service is part of  
20 that group and they will look at uses on the river.  
21 They will look at where the stream flows are and  
22 they'll look at the kind of year we're having, the  
23 precipitation. They'll try to make recommendations to  
24 them and the Bureau of Reclamation needs to decide how  
25 those waters are going to be released and try to best

1 match what those requirements are, but they are not  
2 mandated, regulated amounts, but we need to be doing  
3 everything that we can do to try to match those.

4 In 2010, we, as the State of Utah, actually issued  
5 a proposed plan to, kind of, show how we were going to  
6 work toward meeting those objectives and goals and  
7 we've gone through a couple of processes and it was  
8 about a five-year plan that we were going to come up  
9 with that. We realized, three years into this plan,  
10 that we're already at least a year behind on the plan.  
11 We've met with the Fish and Wildlife Service and, this  
12 year, we've submitted another request for an extension  
13 on that, showing what we're doing, and we're getting  
14 very positive comments from them saying, okay. We  
15 still need to do this. We understand the problems that  
16 we're having and we are looking for modeling things  
17 that we can use and how to best work that together, but  
18 we've just recently requested that extension of that  
19 time frame knowing that we're not going to be able to  
20 get it done by the end of the five-year period. We're  
21 finding support with that and, as long as we're working  
22 and trying to push toward that, I think that's a good  
23 thing, but those flows are not mandated right now, but  
24 they are recommendations from the Fish and Wildlife  
25 Service.

1 Q. They're targets you're trying to hit?

2 A. That's correct and we're very supportive of  
3 that. We're trying to do what we can to make that  
4 happen.

5 Q. Right. Now, you're aware that there are four  
6 endangered species in the Green.

7 A. Yes.

8 Q. They've been talked about, a little bit, so  
9 far and there's more of that to come. How did your  
10 decisions as to these applications take into account  
11 the endangered species act and dealing with those  
12 particular endangered fish?

13 A. And the way we dealt with that is realizing  
14 that, as we're all trying to work together, here, to  
15 maintain those flows, that any new diversion in this  
16 stretch of the river may create an impact to those  
17 endangered fish flows that we're trying to reach and,  
18 so, there's what's referred to as a Section 7  
19 consultation with the Fish and Wildlife Service. We've  
20 actually conditioned these applications on going  
21 through the Section 7 consultation with the Fish and  
22 Wildlife Service to work with them to come up with a  
23 way so they don't put these fish into a jeopardy  
24 situation which will cause problems.

25 I mean, they may not be able to divert it if we

1 can't resolve that problem and, so, it puts them into  
2 that consultation process and they will need to go  
3 through that and work out, with the Fish and Wildlife  
4 Service, how this is going to function and, in the  
5 meantime, we, as the technical working group and  
6 working with the recovery implementation plan to, kind  
7 of, work with the Bureau of Reclamation and Fish and  
8 Wildlife Service to make sure Utah, again, can still  
9 develop our whole allocation of water that we have on  
10 the Colorado and still meet the fish flows and just,  
11 kind of, get everything in balance.

12 So, we'll keep continuing to work to make sure  
13 those flows are there, but we are requiring people, who  
14 are putting new diversions up, to have to go through  
15 that consultation with the Fish and Wildlife Service  
16 who may impose conditions, and probably will impose  
17 conditions, about how or what they need to do to help  
18 mitigate impacts to these endangered fish.

19 Q. If you have an application, such as these,  
20 where you may have, say, a junior water right that  
21 could be cut in the event of shortages and you had to  
22 cut back, how do you evaluate that when you're deciding  
23 to approve an application? You might know, in other  
24 words, that curtailment or priority cuts are possible.  
25 How is it that you approve an application knowing that



1 that's a possibility?

2 A. We would approve applications in that  
3 possibility and have a junior user move into a stream  
4 where we might feel it's fully appropriated; that if  
5 people are not using the full amount of water and  
6 letting that water flow by, that there is a—I mean, we  
7 would investigate as to why water was there, but if it  
8 is there and it's available, we would, then, approve an  
9 application for use of water, as long as it's there,  
10 realizing that there is a junior priority there and, if  
11 a senior user, then, came and put the water back to  
12 use, and there wasn't enough water for the two users,  
13 the junior priority user would have to stop using the  
14 water. So, it's the prior appropriation doctrine.  
15 First in time is first in right.

16 Q. And that's just how it works.

17 A. And we subject all of our applications to  
18 prior rights, subject to them as we approve our change  
19 applications.

20 Q. Do you agree that there's an element of  
21 experimentation that, sort of, informs the  
22 appropriation and change application process? In other  
23 words, if the policy is to put water to beneficial use,  
24 that we're willing to take a bit of a risk to allow a  
25 water user to experiment and see what they can do?

1           A. And I think we've been given Court direction  
2 on that type of issue. If we have a reason to believe  
3 that this can be done, without impairing, we should go  
4 ahead, but statute also tells us that impairment cannot  
5 be the sole reason that we deny an application, that we  
6 should give the applicant an opportunity to be able to  
7 provide some mitigation or compensate, in some way, to  
8 be able to do that. I think, if we looked at an  
9 application and saw there's no way that you can  
10 compensate and not impair, we, probably, would not  
11 approve that application.

12           Q. And you mentioned reason to believe. That's  
13 where I think I would like to finish. What does that  
14 standard mean to you whether it's these applications or  
15 any others? How is that standard met, in your mind?

16           A. I guess that standard is met if it just seems  
17 reasonable to us that there is a way that this can be  
18 done and have it work in such a way that it doesn't  
19 hurt anybody else. We were expecting some evidence  
20 from the applicant to show how this can happen, how it  
21 can go in and be done, without hurting, and, if that  
22 seems reasonable to us, then, normally, we'll go ahead  
23 and grant that application realizing that it's all  
24 subject to prior rights and you can't impair and you've  
25 got to be careful how it works, but if it seems

1 reasonable, we, generally, would go ahead and approve  
2 those applications.

3 Q. And, of course, subject to the ultimate test  
4 of beneficial use.

5 A. That's correct, yeah.

6 MR. WRIGHT: Nothing further, Your Honor.

7 THE COURT: Thank you. I think, ladies and  
8 gentlemen, this would be a good time to break for the  
9 evening. We'll start again at 8:30 in the morning, if  
10 that's all right. Mr. Jones, I'm sorry you have to  
11 come back.

12 MR. JONES: Me too.

13 THE COURT: It's a beautiful drive. If there's  
14 nothing else. I have one question about the exhibits.  
15 The parties have stipulated that Exhibits 1 through 67  
16 would be admitted. Is that correct?

17 MR. WRIGHT: Yes.

18 MS. SWENSEN: That's correct.

19 THE COURT: So, I'm assuming I will set those  
20 over, that they be admitted into evidence. I'm not  
21 quite so sure about 68, 69, 70, 71 and 72 and, I think,  
22 73.

23 MS. SWENSEN: That's right.

24 THE COURT: We haven't offered those,  
25 specifically, and I didn't know if the parties had any

1 kind of agreement with respect to those exhibits.

2 MS. SWENSEN: We have not—I'm sorry, David.

3 MR. WRIGHT: That's okay. No agreement, but I  
4 think they came in legitimately, used for cross with  
5 experts and, so, I don't think I have an objection, but  
6 you're right. They were never actually—

7 THE COURT: Yeah. I just want to know if you want  
8 to offer those exhibits.

9 MS. SWENSEN: I plan to offer them for admission  
10 at the conclusion. Since we're breaking for the day, I  
11 would be fine with just moving to admit those, I  
12 believe, 69 through 73, as submitted.

13 MR. WRIGHT: No objection.

14 THE COURT: There being no objection, 69 through  
15 73 will be admitted into evidence.

16 MS. SWENSEN: Thank you, Your Honor.

17 THE COURT: I just want to make sure we don't  
18 forget those. You, probably, wouldn't have. It's me.  
19 Sixty-eight, that's right, 68 through 73. Very good.  
20 Thanks, everyone. We'll see you at 8:30 in the  
21 morning and commence again. Court will be in recess.

22 BAILIFF: Please rise.  
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C E R T I F I C A T E

I, Ruby Rudisill, do hereby certify that the foregoing pages contain a true and accurate transcript of the electronically recorded proceedings and was transcribed by me to the best of my ability.

\_\_\_\_\_  
Ruby Rudisill

I, Kelly Thacker, do certify this transcription was prepared under my supervision and direction.

\_\_\_\_\_  
Kelly Thacker