UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD

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EVIDENTIARY HEARING

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In the Matter of: :

AREVA ENRICHMENT SERVICES, : Docket No. 70-7015-ML

LLC : ASLBP No.

(Eagle Rock Enrichment : 10-899-02-ML-BD01

Facility) :

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Tuesday, July 12, 2011

Targhee Bonneville Room

Red Lion Hotel

475 River Parkway

Idaho Falls, Idaho

BEFORE:

PAUL G. BOLLWERK, Chair

KAYE D. LATHROP, Administrative Judge

CRAIG M. WHITE, Administrative Judge

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P R O C E E D I N G S

9:30 a.m.

JUDGE BOLLWERK: Let's go on the record, please.

Good morning.

Let me begin by introducing ourselves. To my right is Dr. Kaye Lathrop. Judge Lathrop, a computational physicist, is a part-time member of the Atomic Safety and Licensing Board Panel.

To my left is Dr. Craig White. Judge White is a geologist and a part-time member of the Panel.

My name is Paul Bollwerk. I'm an attorney and a full-time Panel member and the Chair of this Atomic Safety and Licensing Board.

Each of us is an independent Administrative Judge appointed by the five-member Nuclear Regulatory Commission as members of the Atomic Safety and Licensing Board Panel. Members of the Panel are designated by the Agency's Chief Administrative Judge, acting at the behest of the Commission, to serve on three-judge Licensing Boards such as this one, to preside over hearings and Agency licensing or enforcement proceedings in which the Atomic Energy Act, or the AEA, permits or mandates

that a hearing be held.

The Panel's Administrative Judges do not work for or with the NRC staff relative to the staff's own review of such licensing or enforcement matters. Rather, we're charged with deciding in the first instance what is useful to be litigated in the hearing, and for those issues we find to be litigatable, making a determination regarding their substantive validity in terms of granting, conditioning, or denying the requested license or sustaining or modifying the proposed enforcement action.

Our decisions on hearing matters generally are subject to review, first, by the Commission, as the Agency's Supreme Court, and then by the federal courts, including in appropriate instances the United States Supreme Court.

This Licensing Board is here today to conduct an evidentiary hearing regarding the so-called mandatorys portion of the licensing proceeding concerning the December 2008 application of AREVA Enrichment Services, LLC, or AES, under Parts 30, 40, and 70 of Title 10 of the Code of Federal Regulations, or the CFR, for authority to possess and use source byproduct and special nuclear material, and to enrich

natural uranium to a maximum of 5 percent uranium-235 by the gas centrifuge process. Under such a license, AES would be authorized to construct and operate the proposed Eagle Rock Enrichment Facility located in Bonnieville County, Idaho.

Relative to that AES application, over the next several days we will be considering issues that arise under the National Environmental Policy Act of 1969, or NEPA, and generally are associated with the NRC staff's Final Environmental Impact Statement, or FEIS, that was issued in February 2011.

With us today as the parties to the environmental portion of this mandatory hearing are the NRC staff and AES. Let's have the parties identify themselves for the record, starting with the NRC staff.

MS. LEMONCELLI: Good morning, Your Honor.

Mauri Lemoncelli, staff counsel. I am joined by Marcia Simon, to my right, and Christine Jacohim Boote, to my left.

JUDGE BOLLWERK: Thank you very much.

MS. LEMONCELLI: Thank you, Your Honor.

JUDGE BOLLWERK: And AES?

MR. CURTISS: Your Honor, my name is Jim Curtiss, and I am counsel to AREVA in this proceeding.

And I am joined by Tyson Smith, who is also co-counsel.

JUDGE BOLLWERK: All right. Thank you very much.

By way of background, I would note that, in addition to NEPA-related environmental issues, there are also Atomic Energy Act, or AEA, as I mentioned, safety-related matters that must be considered and could be the subject of an evidentiary hearing.

Moreover, in a licensing proceeding like this one, such safety or environmental issues can come before the Board in two ways. The first is as part of a contested portion of the proceeding in which specific challenges to the application and the NRC staff's associated NEPA review, referred to as contentions, can be raised by an individual, a group, or a governmental entity in a hearing petition.

Although the Commission issued a notice in The Federal Register back in July 2009 outlining the process for becoming a party in a contested hearing regarding the AES application, no intervention petitions were submitted. As a consequence, no contested hearing has been convened in this proceeding.

Alternatively, and this is the case in this instance, safety or environmental issues regarding an enrichment facility application may come before a Licensing Board as part of a so-called mandatory portion of the Agency licensing proceeding.

As the Commission noted in its July 2009 Notice of Hearing in this proceeding, which is found in Volume 74 of The Federal Register at page 3052, in the context of this mandatory hearing, the Board must make certain findings regarding the adequacy of the NRC's staff's safety and environmental reviews.

Relative to the AEA safety-related portion of this mandatory hearing proceeding, the Board has already taken a number of steps. In accord with Board issuances dated May 19th, 2010, and October 7th, 2010, outlining the procedures associated with both the safety and environmental aspects of this mandatory hearing, in late 2010 the Board provided, and AES or the staff answered, a set of some three dozen questions regarding a variety of safety-related matters, including some involving non-public information.

Thereafter, the Board specified four safety-related topics -- site-specific, process-related hazards; foreign ownership and control;

license conditions and exemptions, and AES commitments to followup or tracking -- that were to be the subject of party presentations during an evidentiary hearing that was held in late January 2011 in the Licensing Board Panel's Rockville, Maryland, hearing room.

Subsequently, after receiving lengthy filings from both AES and the staff outlining their proposed findings of fact and conclusions of law relative to safety-related matters, in an 88-page partial initial decision issued on April 8th, 2011, and designated as LBP-11-11, the Board concluded that AES's application and the NRC staff's safety review were sufficient to support issuance of a license, albeit conditioned on the resolution of a decommissioning funding financial assurance issue that was then pending before the Commission on a February 18th, 2011 Board-certified question, and the imposition of a license condition regarding the educational and experience qualifications of the proposed facility's Nuclear Criticality Safety Manager.

With regard to that certified question, in a decision issued this morning, designated as CLI-11-04, the Commission indicated that, while the AES commitment to provide a letter of credit issued by

a financial institution whose operations are regulated and examined by a federal or state agency is sufficient to satisfy the decommissioning funding requirements of 10 CFR Sections 30.35(f)(2), 40.36(e)(2), and 70.25(f)(2), the Board and the parties need to consider further the appropriate timing for the submission by AES of the financial instruments needed to comply with Section 20.25(e) of the Commission's regulations that governs the submission of AES's decommissioning funding plan.

I have spoken this morning with Mr. Curtiss briefly before the hearing, and I believe he is going to be talking with the NRC staff later today perhaps about a possible approach to resolving this issue, but this is not something we need to deal with in the near-term. It is something we can deal with at the end of the hearing. So, we will come back to that subject at some point after we're done with our hearing on the NEPA issues.

With regard to the environmental aspects of the case, the Board, likewise, has taken a number of steps to carry out its NEPA-related review responsibilities. First, by issuances dated April 15th, April 22nd, and May 12th, 2011, the Board provided a set of some two dozen questions regarding

the staff's FEIS for response by the NRC staff or AES as part of the mandatory hearing record. Both the staff and AES responded to the Board's questions in filings submitted May 2nd, May 9th, and May 22nd, 2011.

Thereafter, on June 2nd, 2011, the Board issued an order that, in addition to specifying six environmental-related topics for party presentations during this evidentiary hearing, outlined and detailed the procedures governing the submission of prefiled evidentiary exhibits, and posed two additional questions to which the staff and AES responded on June 16th, 2011.

As outlined in the Board's June 2nd issuance, the presentation topics and their order are tentatively as follows:

Presentation 1, purpose and need for the proposed action.

Presentation 2, preconstruction activities.

Presentation 3, greenhouse gas impacts of facility's production power consumption.

Presentation 4, preconstruction and construction air quality impacts.

Presentation 5, radiological effluent

monitoring program, also known as the REMP.

And presentation 6, Historical/Cultural Resources Memorandum of Agreement and associated mitigation measures.

Additionally, in our June 2nd issuance, we indicated that, as we had done in the safety-related evidentiary hearing, to the extent appropriate, we contemplated empaneling both the NRC staff and AES witnesses on these subjects at the same time to expedite and focus the presentations.

Finally, while we do not anticipate extensive witness cross-examination by counsel for the NRC staff or AES during this proceeding, as part of our June 2nd guidance on the conduct of this portion of the mandatory hearing, we indicated that we would afford counsel an opportunity to make opening statements. In that regard, in a moment we will turn first to counsel for the staff for its opening statement, followed by the opening statement of AES counsel.

Then, we'll deal with some administrative matters, including the admission of various exhibits associated with the Board's round of environmental-related written questions. And, then, we will move on to the parties' presentations of the various topics

that I just outlined.

Before we do so, however, I want to make mention of one other aspect of this proceeding. As the Board noted in various instances, including its October 7th memorandum and order, a notice regarding the safety-related evidentiary hearing session which was published in The Federal Register, Volume 76, at page 387, and a second notice regarding these environmental-related hearing sessions, published in The Federal Register, Volume 76, at page 34,103, under Section 2.315(a) of Title 10 of the Code of Federal Regulations, presiding officers are authorized to entertain limited appearance statements from members of the public who are not otherwise parties to the proceeding. These statements, which are placed into the official Agency docket of the proceeding, are intended as an opportunity for members of the public to express their views about it, and may help the Board and the parties in their consideration of the issues in the proceeding.

At this juncture, the Board has received several written limited appearance statements and conducted a transcribed session here in Idaho Falls last night, at which members of the public were afforded the opportunity to present their views and

concerns to the Board orally.

If, however, there is anyone here who would like to provide the Board with a written limited appearance statement, there are forms available on the table in the back, over on the side, that you can complete and return to the Board's Law Clerk, Jon Eser, who is sitting right over there, or its Administrative Assistant, Ashley Prange -- is Ashley here? I think she may have stepped out, but she is around as well -- before this evidentiary proceeding adjourns.

Or, if you prefer, you can submit a statement by mail or email by following the instructions provided in The Federal Register notice published in Volume 76 at page 34,103 or on the information flyer that is also available in the back of the room on the table.

In addition, I would observe today that we will be utilizing some technology in the hearing room that will aid the Board and the parties in conducting a more efficient proceeding. As we did during the safety-related hearing in January in Rockville, Maryland, during this proceeding we will be employing some of the technology that was originally developed for the Yucca Mountain High-Level Waste Repository

hearing proceeding; namely, the Digital Data Management System, or the DDMS.

The DDMS is the Licensing Board Panel's attempt to digitize both the video and documentary record of an evidentiary proceeding and make it accessible and usable to the Board and the litigants in a courtroom setting.

One of the things we will be doing during this proceeding with the remote hearing version of the DDMS is marking the parties' exhibits electronically rather than using an ink stamp or labels, as is customary in many judicial hearings. This may involve some interchange between the Board and our information technology technicians, sitting here to my right.

Also, if it wishes to use it, each of the parties has access to the DDMS from its counsel table via the internet, by which it should be able to keep track of the status of the various exhibits as well search for and view any of the materials that currently reside in the docket of this proceeding.

Additionally, we will be recording the proceeding, which the parties will have available to them via the DDMS after the hearing for, among other things, making any transcript corrections.

Further, we anticipate using display

technology as part of the evidentiary presentations, which, hopefully, will make the information we will be discussing with the parties' witnesses more accessible and understandable to those in the audience today.

Finally, as we begin today's mandatory hearing, I would note that this is my cell phone, and it is off. I'm going to be putting it away in my pocket. I would ask that all cell phones and other similar electronic devices in the hearing room be turned off or placed on vibrate, and that any cell phone conversations be conducted outside of this room. That will be the rule throughout this proceeding.

Also, we ask that no food or beverages other than water be consumed in this hearing room.

Thank you very much for your cooperation with those guidelines.

At this point, then, let's turn to the staff counsel for the staff's opening statement.

OPENING STATEMENT ON BEHALF OF NRC STAFF

MS. BOOTE: Good morning, and thank you for the opportunity to make an opening statement.

With us today are staff members of the Office of Federal and State Materials and Environmental Management Programs and the Region 2 Center for Construction Inspection.

The staff's contractor, Argonne National Laboratory, assisted the staff in its preparation of the Final Environmental Impact Statement and will also provide testimony as part of its work on behalf of the staff.

The Safety Project Manager from the Office of Nuclear Material Safety and Safeguards is also with us today.

The staff submits that its review of environmental matters concerning the AREVA Eagle Rock Enrichment Facility is adequate and complies with all applicable Commission regulations and the National Environmental Policy Act.

The staff's environmental review, as documented in the Final Environmental Impact Statement, focuses on the environmental effects of construction and operation of the gas centrifuge facility. The staff's review included an analysis of impacts of the proposed action in the following areas: land use, visual and scenic resources, water resources, air quality, geology and soil, ecology, noise, transportation, public and occupational health, waste management, socioeconomics, accident scenarios, historical and cultural resources, and environmental justice.

This analysis also includes an evaluation of alternatives to determine whether there is an obviously superior alternative to the proposed site or alternative to the proposed gas centrifuge technology.

Additionally, the Final Environmental Impact Statement includes a discussion on the purpose and need and the cost and benefits of the proposed action.

The staff submits that the Final Environmental Impact Statement provides the necessary basis for the Board to make all the findings required by the Commission in its Notice of Hearing.

Prior to this hearing, the staff also responded to the Board's detailed written questions on environmental topics.

In its presentations at this hearing, the staff will focus on certain specific areas of its review identified by the Board, and the staff is prepared to respond to the Board's questions in these areas.

Thank you.

JUDGE BOLLWERK: Thank you very much.

I'll turn to counsel for AES then.

OPENING STATEMENT ON BEHALF OF AES

MR. CURTISS: Thank you, Your Honor.

We certainly share the staff's views about the adequacy of the environmental review and its robust analysis.

And, further, want to express our appreciation for the Board's diligence in the conduct of this mandatory hearing. We are hopeful that the Board will be able to proceed in a manner consistent with the schedule set out in your order of March 30th, culminating in a final decision on the issues that will be the subject of this hearing in the September timeframe.

Beyond these general observations, there are two topics that I would like to briefly speak to. First, we are obviously pleased that the Commission has now ruled on the issue that the Board certified to the Commission last February, although we note that the Commission's order, as you indicated, Mr. Chairman, identified a discrete issue to be addressed by the Board in this mandatory proceeding.

The time required by the Commission to reach a decision, however, prompts us to observe that we hope you find the presentations today and tomorrow and throughout the week to be responsive to your questions, and that the standards that you will apply in evaluating these presentations, consistent with the

Commission's order at the outset of this proceeding, are clear and will, therefore, not require further clarification from the Commission.

The second topic that I would like to address is the subject of this morning's first presentation, the need for the facility, particularly in view of the focus of last night's limited appearance session on this topic.

Our expert on this topic, Mike Schwartz, has over 35 years of experience evaluating enrichment supply and demand. Indeed, some of you will recall that Mr. Schwartz also testified as the expert in the LES case. He will address the Board's questions on this topic, including the assumptions that the Board's earlier order asked us to make relative to installed nuclear generating capacity.

But we also thought it was important that we address the overall issue of the need for the Eagle Rock Facility in a manner that comports with the decision that the ASLB issued in the LES case on this topic, LBP-05-13.

Briefly, there the Board said at paragraph 4.121 that "The best evidence of LES's ability to enter the market is the willingness of its potential customers to purchase its product." Certainly, that

type of evidence is better than the results of efforts to model the exceedingly complex economic and policy factors that are involved in any projections of supply and demand. Indeed, the latter are, of necessity, entirely dependent for their accuracy upon the ability of the modeler to determine what factors affect the market and how their effects would be manifested; two, mathematically model properly the relationships that would be involved, and, three, accurately predict how those factors would behave over the term of the forecast. For its part, LES has avoided this potentially difficult problem by substituting the facts for speculative projections.

To ensure that we address this issue in a comprehensive way consistent with earlier decisions of the ASLB, Sam Shakir, the CEO of AREVA, will provide the Board an overview of the extent to which the output of Eagle Rock is already under contract.

While the Board's questions did not directly ask for a discussion of contracting activity, we believe this provides an important context for the discussion of need, particularly in view of the prior decision by the ASLB in the LES case.

Once again, we thank the Board for your diligence and hard work in this proceeding, and are

looking forward to the presentations over the next couple of days.

Thank you.

JUDGE BOLLWERK: Thank you, sir, for your opening statement.

All right, at this point, do either of the Board members have anything they want to say? If not, we will move forward.

JUDGE LATHROP: No.

JUDGE BOLLWERK: All right. We need to take care of a couple of administrative first, and this is never exciting, but it is what it is.

First of all, I just wanted to check. We had exchanged, I guess, pleadings and issuances of Board orders, our pleadings from you all, indicating there was no non-public information. And I take it we are still at that point. I don't think there's anything that I've seen that would require that anything be treated as non-public or in any way have to close the hearing.

MR. CURTISS: That's correct in our view, Mr. Chairman.

JUDGE BOLLWERK: Anything from the --

MS. LEMONCELLI: We agree, Your Honor. Thank you.

JUDGE BOLLWERK: Okay. Then, I thought that was the case, but good to check.

In terms of the presentation order, I indicated it might be tentative, but only tentative in the sense that, if there's anyone that has a witness who has had something come up at the last minute that causes a problem in terms of the presentation order, now is the time to speak. But, if not, we will use the order that we already laid out. And if that is fine with the parties, then that's what we'll do. Okay?

One other thing I should mention in terms of an administrative item, we found out recently, actually, yesterday, that they have booked the room behind us for a luncheon, a Chamber of Commerce luncheon for, I guess, the Town or the City of Yellowstone. It's supposed to start about quarter to 12:00 and will last until around one o'clock.

It's probably better that we don't try to compete with them in terms of their speaker and what's going on. So, normally, we would try to find a good spot to take a break and work from there. We may have to sort of have an imposed break if things begin to get a little bit noisy on the other side.

It is only supposed to last until 1:00.

So, hopefully, it will not be a lengthy luncheon break, but I think it's better than trying to complete with them, to go ahead and just move forward.

I should also mention that behind these blinds is a swimming pool. And we have been sort of monitoring that, and it hasn't caused a problem up to this point. In fact, the rain today has kept things sort of -- if this were the winter or an evening, it would not be an issue, but during the summer it could be, but we don't think that's going to be a problem. But if you hear some noise from the other side, that's what may be going on there and we'll try to avoid -- hopefully, there won't be too many screaming pool users outside. We thought about putting up signs, but we thought that might just be throwing fuel on the fire.

(Laughter.)

So, in any event, I don't think it's going to become an issue. But if you hear something coming from the other side, that's what it is.

So, in terms of the luncheon, again, we'll try to monitor what's going on. But when they begin to arrive, we're probably going to hear it and it's probably about time for us to take a break, and we'll come back around 1:00 or thereafter. So, all right.

At this point, we have some evidentiary materials that we need to admit that relate to the Board questions that were asked.

And I should mention we have been going about half an hour, and if someone wants to take a break for the restroom, this would be a good time to do it because the lawyers and the Board are going to interact here for a couple of minutes to get some evidentiary material admitted.

This is material that relates to the questions that the Board asked. And as part of this process, we had asked the parties to prefile it as evidentiary material, and we now need to admit that material into evidence.

We will be doing, I should mention, the same thing with respect to the presentation materials, but we will be doing those with respect to each presentation. But these are materials from both the staff and AES that relate to their questions, and we need to get those into the record sort of upfront.

So, who would like to start, AES or the staff?

MS. LEMONCELLI: We're happy to, Your Honor.

JUDGE BOLLWERK: Okay. Let me flip over

then.

And if you would, I'm of the old school, and I sort of like to have a number that matches at least a partial title. So that, if there's any questions that come up later, we can reference that.

But the basic idea here would be to go ahead and to give this the exhibit number and a brief title. We'll have it marked for identification and, then, we will have it admitted into evidence.

And we did this in January. I think the drill is fairly clear, although somewhat lengthy.

So, whenever you're ready.

MS. LEMONCELLI: Your Honor, just as a point of clarification, would you also like us to include the presentations that we will utilize this morning and throughout the rest of the hearing?

JUDGE BOLLWERK: Well, let's wait on those. Let's do those on a presentation-by-presentation basis, so there's no confusion. So, let's just deal with the question material, which I think would run up through -- hold on one second here -- I believe Staff Exhibit probably 189.

MS. LEMONCELLI: One eighty-nine, Your Honor.

JUDGE BOLLWERK: Does that sound right?

MS. LEMONCELLI: Thank you for the clarification.

JUDGE BOLLWERK: All right.

So, I think we want to start, if my record's right, with 134.

MS. LEMONCELLI: Correct.

JUDGE BOLLWERK: All right.

MS. LEMONCELLI: Yes. Thank you, Your Honor.

I'll begin with NRC000134, Environmental Impact Statement for the Proposed Eagle Rock Enrichment Facility in Bonnieville County, Idaho, NUREG-1945, Volume 1, dated February 2011.

NRC000135, Environmental Impact Statement for the proposed Eagle Rock Enrichment Facility in Bonnieville County, Idaho, NUREG-1945, Volume 2, February 2011.

NRC000136, NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated May 2nd, 2011.

NRC000137, Affidavit of Tim Allison concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 2nd, 2011.

NRC000138, Affidavit of John Joseph Arnish

concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 22nd, 2011.

NRC000139, Affidavit of Bruce M. Biwer concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 21st, 2011.

NRC000140, Affidavit of Greg C. Chapman concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 19th, 2011.

NRC000141, Affidavit of Karl Fischer concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 21st, 2011.

NRC000142, Affidavit of Elizabeth Hocking concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 21st, 2011.

NRC000143, Affidavit of Ronald L. Kolpa concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 22nd, 2011.

NRC000144, Affidavit of Stephen Lemont concerning the NRC staff response to the Licensing

Board's initial questions regarding environmental matters, dated April 25th, 2011.

NRC000145, Affidavit of Daniel O'Rourke concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 21st, 2011.

NRC000146, Affidavit of Terri L. Patton concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 21st, 2011.

NRC000147, Affidavit of Kurt Picel concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 21st, 2011.

NRC000148, Affidavit of Robert Van Lonkhuyzen -- let me spell that for you, L-O-N-K-U-Y-Z-E-N -- concerning the NRC staff response to the Licensing Board's initial questions regarding environmental matters, dated April 21st, 2011.

JUDGE BOLLWERK: Just to clarify one thing, I have it spelled L-O-N-K-H-U-Y-Z-E-N.

MS. LEMONCELLI: I apologize. Thank you for the clarification.

JUDGE BOLLWERK: We're on the same page then?

MS. LEMONCELLI: Yes. Thank you, Your Honor.

JUDGE BOLLWERK: All right.

MS. LEMONCELLI: NRC000149, Statement of Professional Qualifications of Tim Allison, filed May 2nd, 2011.

NRC000150, Statement of Professional Qualifications for John Arnish, filed May 2nd, 2011.

NRC000151, Statement of Professional Qualifications for Bruce M. Biwer, filed May 2nd, 2011.

NRC000152, Statement of Professional Qualifications for Karl Fischer, filed May 2nd, 2011.

NRC000153, Statement of Professional Qualifications for Elizabeth K. Hocking, filed May 2nd, 2011.

NRC000154, Statement of Professional Qualifications for Ron Kolpa, filed May 2nd, 2011.

And NRC000155, Statement of Professional Qualifications for Stephen Lemont, filed May 2nd, 2011.

And I'll turn to Ms. Simon.

JUDGE BOLLWERK: All right. You decided to break up this daunting task? All right.

MS. SIMON: That's correct, Your Honor.

NRC000156, Statement of Professional Qualifications for Daniel J. O'Rourke, filed May 2nd, 2011.

NRC000157, Statement of Professional Qualifications for Terri L. Patton, filed May 2nd, 2011.

NRC000158, Statement of Professional Qualifications for Kurt Picel, filed May 2nd, 2011.

NRC000159, Statement of Professional Qualifications for Robert Van Lonkhuyzen, filed May 2nd, 2011.

NRC000160, Press Release, Department of Energy, "DOE Offers Conditional Loan Guarantee for Front-End Nuclear Facility in Idaho", dated May 20th, 2011.

NRC000161, transcript of the hearing before the Subcommittee on Energy of the Senate Committee on Energy and Natural Resources, 111th Congress, dated June 15th, 2010, excerpt.

NRC000162, letter to Susan Pengilly, Deputy State Historic Preservation Officer, Idaho SHPO, re: Draft Memorandum of Agreement, dated March 30, 2011.

NRC000163, letter to Jim Kay, AES Licensing Manager, re: Draft Memorandum of Agreement,

dated March 30th, 2011.

NRC000164, letter to Carolyn Smith, Cultural Resource Coordinator, The Shoshone-Bannock Tribes, re: Draft Memorandum of Agreement, dated March 30, 2011.

NRC000165, Western Cultural Resource Management, Inc., letter to Idaho SHPO, re: Data Recovery Activities, dated November 17th, 2010.

NRC000166, Idaho SHPO letter to AES, re: Geotechnical Borings at the Proposed Twin Buttes Substation within MW004, dated November 26th, 2010.

NRC000167, Safety Evaluation Report for the Eagle Rock Facility in Bonnieville County, Idaho, NUREG-1951, Appendix B.

NRC00 --

JUDGE BOLLWERK: Let me just -- that is a non-public document. That is how I have it marked. Okay.

MS. SIMON: That's correct, Your Honor.

NRC000168, Idaho Greenhouse Gas Inventory and Reference Case Projections 1990 through 2020, Center for Climate Strategies, dated spring 2008, excerpts.

NRC000169, Environmental Impact Statement for Combined Licenses, COLs, for South Texas Project

Electric Generating Station, Units 3 and 4, NUREG-1937, dated February 2011, excerpts.

NRC000170, NRC staff response to the Licensing Board's second set of questions regarding environmental matters, dated May 9th, 2011.

NRC000171, Affidavit of John Joseph Arnish concerning the NRC staff response to the Licensing Board's second set of questions regarding environmental matters, dated April 27th, 2011.

NRC000172, Affidavit of Karl Fischer concerning the NRC staff response to the Licensing Board's second set of questions regarding environmental matters, dated April 25th, 2011.

NRC000173, "Population Distribution and Change: 2000 to 2010", U.S. Census Bureau, dated March 2011.

NRC000174, "CAP88-PC User's Guide, Version 3.0", dated December 2007, excerpts.

And at this point, I'll turn it over to Ms. Boote.

JUDGE BOLLWERK: All right. You must be in the home stretch now.

MS. BOOTE: NRC000175, S.R. Hanna, G.A. Briggs, and R.P. Hosker, "Handbook on Atmospheric Diffusion", dated 1982, excerpt.

NRC000176, NRC staff response to the Licensing Board's third set of questions regarding environmental matters, dated May 27th, 2011.

NRC000177, Affidavit of Bruce M. Biwer concerning the NRC staff response to the Licensing Board's third set of questions regarding environmental matters, dated May 19th, 2011.

NRC000178, Affidavit of Ronald L. Kolpa concerning the NRC staff response to the Licensing Board's third set of questions regarding environmental matters, dated May 19th, 2011.

NRC000179, Affidavit of Stephen Lemont concerning the NRC staff response to the Licensing Board's third set of questions regarding environmental matters, dated May 19th, 2011.

NRC000180, Affidavit of Terri L. Patton concerning the NRC staff response to the Licensing Board's third set of question regarding environmental matters, dated May 19th, 2011.

NRC000181, Affidavit of Robert Van Lonkhuyzen concerning the NRC staff response to the Licensing Board's third set of questions regarding environmental matters, dated May 13th, 2011.

NRC000182, U.S. Environmental Protection Agency, eGRID2010, Version 1.0, Year 2007, GHG Annual

Output Emission Rates.

NRC000183, U.S. Environmental Protection Agency, "Using Smart Growth Techniques as Stormwater Best Management Practices", dated December 2005, excerpt.

NRCR00184, NRC staff response to the Licensing Board's fourth set of questions regarding environmental matters, dated June 17th, 2011.

NRC000185, Affidavit of Bruce M. Biwer concerning the NRC staff response to the Licensing Board's fourth set of questions regarding environmental matters, dated June 14th, 2011.

NRC000186, Affidavit of Stephen Lemont concerning the NRC staff response to the Licensing Board's fourth set of questions regarding environmental matters, dated June 10th, 2011.

NRC000187, Affidavit of Daniel O'Rourke concerning the NRC staff response to the Licensing Board's fourth set of questions regarding environmental matters, dated June 14th, 2011.

NRC000188, Regulatory Guide 4.9, "Preparation of Environmental Reports for Commercial Uranium Enrichment Facilities", Revision 1, October 1975.

NRC000189, NUREG-1748, Environmental

Review Guidance for Licensing Actions Associated with NMSS Programs, dated July 2003.

JUDGE BOLLWERK: All right. That's all we have, then, for the questions. All right.

MS. BOOTE: Yes, Your Honor.

JUDGE BOLLWERK: All right. Then, the record should reflect that Exhibits NRC000134 through NRC000183, Exhibit NRCR00184, and Exhibits NRC000185 through NRC000189 are marked for identification.

[Whereupon, the documents were marked as Exhibits NRC000134 through NCR000183, Exhibit NRCR00184, and Exhibits NRC000185 through NRC0000189 for identification.]

MS. LEMONCELLI: Your Honor, at this time, the staff moves to enter these exhibits into evidence.

JUDGE BOLLWERK: All right. Any objections?

MR. CURTISS: No objection.

JUDGE BOLLWERK: There being no objections, then Exhibits NRC000134 through NRC000183, Exhibit NRCR00184, and Exhibits NRC000185 through NRC000189 are admitted into evidence.

[Whereupon, the documents

marked as Exhibits NRC000134 through NCR000183, Exhibit NRCR00184, and Exhibits NRC000185 through NRC0000189 for identification were admitted into evidence.]

JUDGE BOLLWERK: All right. Then, we will turn to AES and let you do the same thing.

MR. CURTISS: I intend to distribute our response equitably here, exclusively to Mr. Smith.

(Laughter.)

JUDGE BOLLWERK: All right. Equity is in the eye of the beholder, I guess.

MR. SMITH: Exactly.

I am going to identify the AREVA exhibits associated with the written responses to the Board's question. I have that as Exhibits 64 through 101.

First, we have AES000064 as the AES response to the initial environmental questions, dated May 2nd, 2011.

AES000065, Affidavit of Mark Strum, dated May 2nd, 2011.

AES000066, Affidavit of James A. Kay, dated May 2nd, 2011.

AES000067, Affidavit of Barry Martin

Tilden, dated May 2nd, 2011.

AES000068, Affidavit of Nicholas Panzarino, dated May 2nd, 2011.

AES000069, Statement of Professional Qualifications for Nicholas Panzarino.

AES000070, Eagle Rock Enrichment Facility Environmental Report, Revision 2, Chapters 1 through 10.

JUDGE BOLLWERK: That's the consolidated exhibit? I know there was some question about an A, B, and C, but this is the one that's all together, right?

MR. SMITH: Correct, that contains all of Chapters 1 through 10.

JUDGE BOLLWERK: Thank you.

MR. SMITH: AES000072, this is Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs", Revision 2, dated July 2007.

JUDGE BOLLWERK: Just stop one second. Did we did 71 or did I -- I interrupted the flow.

MR. SMITH: I'm sorry. I skipped 71.

JUDGE BOLLWERK: Okay. All right. I want to make sure we just get it in there.

MR. SMITH: I'm crossing off as I go and I just --

JUDGE BOLLWERK: I'm not helping things here any; this is bad enough. But go ahead.

MR. SMITH: AES000071, a letter from AES to NRC, AES-0-NRC-11-00976, "Surface Soil Sampling for the Eagle Rock Enrichment Facilities", dated April 7th, 2011.

I did AES000072 already. I'm going to skip to AES000073. That is NUREG-1575, the "Multi-Agency Radiation Surveys and Site Investigation Manual", MARSSIM, Revision 1.

AES000074, letter to George Harper, Eagle Rock Enrichment Facility, from Kenneth Reid, the State Archaeologist and Deputy SHPO, dated September 29th, 2009.

AES000075, that's DOE/EIS-0269. That is the Final Programmatic Environmental Impact Statement for the Long-Term Management of Depleted Uranium Hexafluoride, Appendix B.

AES000076, that is Appendix D of DOE/EIS-0269.

AES000077, U.S. Department of Health and Human Services, Toxicological Profile for Hydrogen Fluoride and Fluorine, dated September of 2003.

AES000078, that's the Affidavit of George Harper, dated May 2nd, 2011.

AES000079 is the AES response to the second set of environmental questions, dated May 9th, 2011.

AES000080 is the Eagle Rock Enrichment Facility Environmental Report, Revision 2, Appendix H. That's pages H-1 to H-56 and tables.

AES000081, Affidavit of Nicholas Panzarino, dated May 9th, 2011.

AES000082, Affidavit of George Harper, dated May 9th, 2011.

AES000083, Affidavit of Edward Redente, dated May 9th, 2011.

AES000084, Statement of Professional Qualifications for Edward Redente, dated May 9th, 2011.

AES000085, Affidavit of George Klimkiewicz, dated May 9th, 2011.

AES000086, Statement of Professional Qualifications for George Klimkiewicz, dated May 9th, 2011.

AES000087, Affidavit of Stacy Thomson, dated May 9th, 2011.

AES000088, Statement of Professional Qualifications for Stacy Thomson, dated May 9th, 2011.

AES000089, Affidavit of James Kay, dated

May 9th, 2011.

AES000090, Affidavit of Christopher Andrews, dated May 9th, 2011.

AES000091, Affidavit of Mark Wescoat, dated May 9th, 2011.

AES000092, Statement of Professional Qualifications for Mark Wescoat, dated May 9th, 2011.

AES000093, Affidavit of Robert Poyser, dated May 9th, 2011.

AES000094, Statement of Professional Qualifications for Robert Poyser, dated May 9th, 2011.

AES000095, AES response to the third set of environmental questions, dated May 27th, 2011.

AES000096, Affidavit of Robert Poyser, dated May 27th, 2011.

AES000097, Affidavit of Edward Redente, dated May 27th, 2011.

AES000098, Affidavit of George Harper, dated May 27th, 2011.

AES000099, AES response to the fourth set of environmental questions, dated June 16th, 2011.

AES000100, Affidavit of James Kay, dated June 16th, 2011.

And lastly, AES000101, Affidavit of George Harper, dated June 16th, 2011.

JUDGE BOLLWERK: All right. Thank you.

The record, then, should reflect that Exhibits AES000064 through AES000101, as identified by counsel, are marked for identification.

[Whereupon, the documents were marked as Exhibits AES000064 through AES000101 for identification.]

MR. SMITH: And we would like to move to admit these exhibits into the record.

JUDGE BOLLWERK: Objection?

MS. LEMONCELLI: No objection, Your Honor.

JUDGE BOLLWERK: There being no objection, then Exhibits AES000064 through AES000101 are admitted into evidence.

[Whereupon, the documents marked as Exhibits AES000064 through AES000101 for identification were admitted into evidence.]

JUDGE BOLLWERK: All right. And I should mention that this is the overwhelming number of exhibits. We will have many fewer with each of the presentations. So, we will not have to go through that long litany again.

All right. We have actually been going a little less than an hour. Do we want to take a brief break before we begin with the first witness? Or what is counsels' preference?

MS. LEMONCELLI: May we have a short break, Your Honor?

JUDGE BOLLWERK: All right. Why don't we take, let's take about five minutes? Is that long enough?

MS. LEMONCELLI: Thank you, Your Honor.

JUDGE BOLLWERK: And, then, we will start with the first witness, the first presentation.

Thank you.

(Whereupon, the foregoing matter went off the record at 10:17 a.m. and went back on the record at 10:24 a.m.)

JUDGE BOLLWERK: All right, if we could go back on the record, please?

The two little beeps you heard is something they added in the system for this. I think this is our new system. And I'll try to use those as sort of -- it's not an elevator arriving. It's actually we'll have everybody sort of come back to order. I'd appreciate it, when you hear that, if you could just take your seat; we'll begin again.

All right. I think we're ready now for the panels for the first presentation, and we have the presentation itself, actually, the lead party is AES. This is on the purpose and need for the proposed action for the construction and operation of the Eagle Rock Facility. There are two presenters on behalf of AES, and the NRC staff is also going to have two witnesses available to answer any Board questions that there may be.

So, why don't we have the witnesses come up to the witness table?

And we will go ahead and get the AES witnesses sworn in first and have their materials put into evidence, and then we will turn to the staff witnesses.

All right, I think, do you want to go ahead and introduce your witnesses?

MR. CURTISS: Yes. Our two witnesses, on the far right, are Mr. Mike Schwartz, and next to him, on his right, is Mr. Sam Shakir.

JUDGE BOLLWERK: All right. If you gentlemen could please raise your right hand? And I need a verbal response to the question I'm going to ask you.

WHEREUPON,

MIKE SCHWARTZ AND SAM SHAKIR

having been called as witnesses by Counsel for AES, were duly sworn.

JUDGE BOLLWERK: Thank you.

All right. I think we have a couple of exhibits.

MR. SMITH: Correct. We have three exhibits, Your Honor.

JUDGE BOLLWERK: All right. Let's go ahead and take care of those.

MR. SMITH: Okay. First, I'm going to identify the three AREVA exhibits associated with this first presentation topic.

We have AES000102. It is the AES presentation on topic one, "Purpose and Need for the Proposed Action", dated July 1st, 2011.

AES000103, it is the ERI presentation on topic one, "Purpose and Need for the Proposed Action", dated July 1st, 2011.

And we have AES000104, which is the Statement of Professional Qualifications for Michael Schwartz.

JUDGE BOLLWERK: All right. And Mr. Shakir already had his professional qualifications put in the safety proceeding?

MR. SMITH: Correct. Mr. Shakir's statement of professional qualifications were Exhibit AES000013.

JUDGE BOLLWERK: All right. And the Board has indicated that if there were any issues with respect to the admission, or I'm sorry, the consideration of a safety-related exhibit in the environmental portion of the proceeding, that the parties should let the Board know.

We weren't really anticipating that would happen, and we haven't heard anything from you all. So, our assumption is it's theoretically possible that something admitted on the safety side someone could have objection to on the environmental side per relevance or something else, but it didn't happen. So, we'll simply assume that anything that came in on the safety side is fair game for the environmental side as well.

All right. Good.

All right, let me go back and take care of one piece of business here. Exhibits AES000102 through AES000104, as described by counsel, are marked for identification.

[Whereupon, the documents were marked as Exhibits AES000102

through AES000104 for identification.]

MR. SMITH: And we would like to move to admit those into evidence in this proceeding.

JUDGE BOLLWERK: All right. Any objection?

MS. LEMONCELLI: No objection, Your Honor.

JUDGE BOLLWERK: There being no objection, then Exhibits AES000102 through AES000104 are admitted into evidence.

[Whereupon, the documents marked as Exhibits AES000102 through AES000104 for identification were admitted into evidence.]

JUDGE BOLLWERK: All right. And, then, we need to deal with the staff witnesses here very quickly. Would you like to introduce them?

MS. LEMONCELLI: Yes, Your Honor. We have Dr. Stephen Lemont with the NRC staff and Dr. Bruce Biwer with Argonne National Lab.

JUDGE BOLLWERK: All right. Gentlemen, again, I need you to raise your hands, and I need a verbal response to the question I'm going to ask you.

WHEREUPON,

STEPHEN LEMONT AND BRUCE BIWER
having been called as witnesses by Counsel for NRC staff, were duly sworn.

JUDGE BOLLWERK: Thank you.

And, then, I think we have a couple of staff -- no, do we have a staff exhibit on this one or not?

MS. LEMONCELLI: No, Your Honor.

JUDGE BOLLWERK: Okay. I guess their professional qualifications were admitted as part of the question material?

MS. LEMONCELLI: Correct, Your Honor. Dr. Stephen Lemont's was admitted as NRC000155, and Dr. Bruce Biwer's statement of professional qualifications is admitted at NRC000151.

JUDGE BOLLWERK: All right. Thank you very much.

MS. LEMONCELLI: Thank you, Your Honor.

JUDGE BOLLWERK: All right. As I mentioned before, the lead party on this presentation is AES, and we'll be hearing from both their witnesses. They have two presentation slides that we will be looking at.

And I wanted to mention, by way of background, in terms of this presentation and why the

Board asked for it, to hear from the parties on this, it seemed to us, in light of the Fukushima incident, the accident there, that this is one of the things that seemed to us to have some impact, again, an accident coming after the Environmental Impact Statement was issued.

There were some other items that we actually addressed in the safety decision, things like earthquakes and loss of offsite power, that we actually dealt with to a degree in the safety decision. But this was one that was not. It seemed to be outstanding to us.

I would agree with Mr. Curtiss that it's difficult to predict these things, which is one of the reasons why the Board used a figure which perhaps might be considered back-of-the-envelope, but we felt it was at least a stress-test sort of figure that would give us a good sense of whether AES -- in terms of the need for the facility.

Having said that, we have no problem with you all presenting your own set of numbers which you feel you can support. We appreciate you taking that step, as well as addressing the figures that the Board gave you. So, we are certainly interested in hearing what you have to say and, also, what the staff may

think about the information that AES has provided us.

So, with that sort of background, anything the Board members want to say in that regard? No?

All right, again, this was a topic, as Mr. Curtiss also mentioned, that was of interest last night during the limited appearances, something the Board is very interested in. So, we are very interested to hear what you have to tell us this morning, and we appreciate both of you making yourselves available to us.

Thank you.

MR. CURTISS: Thank you.

So, I think we will begin with Mr. Shakir. And if we could have Exhibit 000102, I think that's the PowerPoint presentation from which he will speak.

MR. SHAKIR: Good morning.

My name is Sam Shakir. I'm the Presidency of AREVA Enrichment Services, the subsidiary established to ultimately own and operate this facility, Eagle Rock.

There's two components to my presentation, to the presentations that we are going to be making today. One of them deals directly with the question that was asked by the Board which is going to be addressed by ERI in the second presentation. We took

the liberty of bringing some additional information related to the need for this facility, which I think is important. Counsel has alluded to this in the opening remarks, which really puts the business into context, why we're making this investment, why we believe this business is viable, is needed. And that is to deal with the contracts, the commitments that the end-users, the utilities, have made to the future output of this facility. And that's what I will be presenting to you this morning.

Slide No. 2 of the presentation kind of touches on what I just mentioned, the two components to our presentations this morning. But, at the end of these two presentations, we believe that the need, as described in the ER, is valid, that we have compelling reasons for why we need to move forward with this facility and get a license to move forward.

The contracts, which I will be talking about, in our view, and using a term that was used in the LES hearings, presents really the best evidence, independent of any projections in the future about what the market will look like for enrichment and for nuclear energy in general.

Turning to page No. 3 of the presentation, and the question is, why Eagle Rock? The business

case for Eagle Rock was always based on the existing U.S. fleet without any new built. The reasons for us to pursue and to make this investment was always based on the 104 operating reactors here in the United States. It was really never about new builds. New builds were going to be a growth that we could deal with in the future through expansion of these facilities.

The current U.S. demand is approximately 14.5 million SWUs per year and growing. One thing that is very important to remember is that demand has continued to grow, not because we built any new plants, but because we have, as an industry, continued to successfully implement power uprates for a lot of our facilities here in the United States.

Over the last 15 years, it was an equivalent of 20 new nuclear power plants built in the United States that were never constructed. They're just increased output from the existing fleet. And that's something very important to remember.

Today, approximately 40 percent of the current supply of enriched uranium is provided by the Russian HEU Agreement. This is a downblending of highly-enriched uranium coming in from Russia. That agreement expires in 2013, which ultimately would

leave a significant gap in supply.

At one point, in this country we had two gas diffusion plants that were producing enriched uranium here to domestically. One of them is already shut down. One of them will be shut down in the next few years, sometime between 2012 and 2016. Those are energy-intensive facilities that have proven to be not economical and need to be replaced by more viable technologies.

The only new plant that has been brought online since is the plant in New Mexico. It began production last year, but it's still under construction. When it reaches full capacity, it will meet a quarter to a third of the demand here in the U.S., depending on how much capacity is ultimately constructed down in New Mexico.

U.S. policy has been consistent, and this was mentioned last night in the public statements. U.S. policy has been consistent has far as supporting expanding domestic enrichment capacity to create viable domestic capacity. In 2005, in the 2005 Energy Act, Congress included a $2 billion loan guarantee authority in that Energy Act to promote the construction and operation of domestic enrichment facilities.

In 2010, in May of 2010, the DOE, after a year or so of review of our application, awarded us a conditional commitment for the $2 billion of loan guarantee. And in the press release by DOE at that point, the Energy Secretary, Secretary Chu, said, "Increasing uranium enrichment" -- and I quote -- "Increasing uranium enrichment in the United States is critical to the nation's energy and national security." So, the U.S. policy has been consistent over the years about the need for domestic enrichment capacity.

Without Eagle Rock, the United States will have to rely heavily on foreign sources of supply, and primarily from Russia. As I mentioned earlier, the HEU Agreement with Russia expires in 2013. That means Russian enrichment capacity could be ramped up to fill in that void.

And I would just remind everyone here of the reliance that Europe has on Russian gas supply and some of the issues they've had in the past, not something that we would like to see our country be in that position.

JUDGE BOLLWERK: Before you move on, let me ask you several questions about that slide. To the degree you know, how many SWU were added with respect

to these power uprates? I mean they're not huge, but they are incremental. What kind of SWU increase attaches to a particular power uprate, if you know?

MR. SHAKIR: I'll just do the math in my head. If you take 20 new 1,000-megawatt reactors, each one will probably use about 100,000 SWUs per year to operate. So, roughly, 2 million SWUs. Again, that's just a rough calculation in my head.

JUDGE BOLLWERK: All right. You mentioned the Russian HEU Agreement that expires in 2013. Is there any likelihood that will be extended?

MR. SHAKIR: The Russians have repeatedly said that they will not extend that agreement.

JUDGE BOLLWERK: Does staff have any comments on the Russian HEU Agreement? Any possibility of extension?

DR. BIWER: No, we have no information on that.

JUDGE BOLLWERK: All right.

JUDGE LATHROP: How about the possibility of DOE HEU? Is there any possibility of increase?

DR. BIWER: Using the stockpile?

JUDGE LATHROP: Indeed?

DR. BIWER: That would depend on, I guess, the urgency that the Administration saw as far as the

problem went.

JUDGE LATHROP: Hasn't the Administration's policy been to reduce the stockpile, thereby making available more HEU for civilian use?

MR. SCHWARTZ: Your Honor, I would be happy to address that.

JUDGE LATHROP: Thank you, Mr. Schwartz.

MR. SCHWARTZ: The approach taken so far has been one of really struggling to just provide the level of supply from the U.S. HEU that they have been doing right along. We don't see that increasing.

As a matter of fact, some of the material that had been tentatively set aside and expected to become available for downblending for eventual civilian use, we have been told that the Navy has decided that they may, indeed, want to make use of it.

So, I think that the level of material that is being assumed right now, which is on the order of 300,000 SWU-equivalent per year, is probably as much as it is likely to be.

JUDGE LATHROP: Thank you.

JUDGE BOLLWERK: In terms of -- let me get my documents in order here. One second.

Could you bring up the previous slide, the previous set of slides? And I think we were on page

3, if I remember correct.

MR. SHAKIR: Yes.

JUDGE BOLLWERK: Questions were raised, I guess, by the Board, among others, about the currentness, as it were, or the timeliness of DOE's policy in terms of the need for the United States to have domestic enrichment. And I guess this statement, as well as one that was referred to, I believe, in 2002, if I've got the right date -- is there any reason why DOE hasn't come forward with another statement like it did in 2002, which was fairly definitive, but, you know, it's almost 10 years old now, in terms of something. I'm not saying that Secretary Chu is not speaking officially, but, certainly, that's not part of a DOE report. It's more a part of a press statement or an explanation about the contract, or about the loan guarantee, I'm sorry.

Does DOE assess this on a regular basis?

MR. SHAKIR: I'll be happy to give my opinion on this. We have not specifically requested DOE to make statements about this, but I think the policy has been pretty clear, and the actions that DOE has taken over the years has been, I would say, speaking louder than necessarily the letter that was referred in 2002.

In 2005, they included in the Energy Act $2 billion to promote construction of enrichment facilities, recognizing the need for these facilities.

In 2010, they awarded us a conditional commitment, and there were specific statements made about why this was necessary and important.

So, I think they have taken action rather than just make statements about the need to create a viable, competitive domestic enrichment capacity.

One thing that ties around all this is the idea that, if we don't build that capacity here to meet our needs, and possibly be in a position to provide supply to other parts of the world, somebody else will build it elsewhere. And from a Department of Energy and a policy standpoint, they would rather see that capacity built right here.

JUDGE BOLLWERK: And I take it, because you stressed the foreign in your concerns, that the Russians will, in fact, step into the breach, assuming there is one?

MR. SHAKIR: The Russians and possibly other players that we don't want to be necessarily involved in a fuel cycle facility like this.

JUDGE BOLLWERK: All right. All right. I had interrupted you. If you want to proceed with

your slides?

MR. SHAKIR: Sure. No problem.

One thing that I wanted to mention, also, that this facility that we are contemplating to build here, and we are anxiously awaiting for a license for, is a modular facility, which means, from us, from our standpoint, from a business standpoint, it gives us the ultimately flexibility of building to capacity, and to the capacity that we need.

And the capacity we need is what we believe the market shows to be and what the contracts ultimately from our customers demand. So, this is an important consideration that we will not be, as a business, making an investment into a facility whereby its capacity is not needed.

Turning to page No. 4, I wanted to briefly address what I believe to be the best evidence of the demand. We applied for a license in 2008. It's been under review since then.

By about the end of 2009, and at least two years in advance of even receiving a license from the NRC, we managed to sign up contracts for the majority of the output of this facility. So, if you think of it, this several years before the license is issued, and certainly a few more years before the facility

goes online. Really an unprecedented way of doing business for the utilities to sign up for very long-term contracts going out as far as 2028 and don't start supply for at least a few years.

For us in the industry -- and we have been, obviously, providing these services and supplying materials to U.S. utilities -- U.S. utilities typically play the short-term market. They don't like to sign up for very long-term contracts, unlike counterpart Asian utilities, for example.

In this case, sensing the potential stress in the market for supply in the future and for security of supply, they were willing to sign long-term contracts that start off way in the future and go on for many, many years beyond that. A very compelling reason for, at least from the utilities' perspective, the end-user here, why this facility is important. They view this as a very strategic investment by AREVA to secure their supply in the future.

Today, 90 percent of the output of this facility that hasn't even received a license yet is sold, at least for the first 3.3 million SWU of production. We will continue to commercially make available the SWU output for this facility, but at

this point we are sold out for the first several years of output from this plant.

These contracts are signed with major U.S. utilities, representing 50 percent of the U.S. operating fleet today. I mentioned earlier that our business plan was always based on the existing fleet and was never about new builds. New builds just represent future new opportunities for us that we could expand to capture as well.

So, this facility is important. The U.S. nuclear fleet, the existing fleet, is counting on this facility to come online as planned.

Of course, the events of Fukushima are tragic, and it was mentioned extensively last night. We certainly see impact of that on global demand in general in the future, and it will be addressed by Mike Schwartz here in his presentation.

But as far as the U.S. nuclear fleet that is in operation today, there's absolutely no indication whatsoever that any of those facilities that we operate here today safely will be impacted, that they will be coming offline, that the demand here in the U.S. will change. Several renewals have been issued, license renewals, have been issued since Fukushima. Several uprates have been authorized by

the NRC since Fukushima.

So, we see this fleet, while it will be reviewed and stress-tested, if you will, to make sure that it's safe to operate, will continue to safely operate for many years to come, and Eagle Rock will be in a position to provide the necessary supply right here domestically-produced.

Thank you.

JUDGE BOLLWERK: You had mentioned, I guess, my recollection was in the safety hearing there was a similar statement, and it was the majority. You're now saying it's 90 percent of the first 3.3 million SWU, is what --

MR. SHAKIR: That's correct.

JUDGE BOLLWERK: -- have committed?

Does that basically cover the first, since you mentioned modular, is that the first module, essentially, for you all?

MR. SHAKIR: Yes. Our plan, we call it the initial phase, to build the first 3.3 million SWU. And, then, depending on how the contracting and the commercial aspect of this moves forward, we will make a decision on building the remaining capacity.

JUDGE BOLLWERK: And in terms of committed, by that, you mean that if the Russians come

in and offer them a better price, they're committed to you; they will stick with you contractually?

MR. SHAKIR: They are signed contracts with complete commitments.

JUDGE BOLLWERK: Someone else, whether the Russians, or I have no idea who else it might be, but all right.

And in terms of the 90 percent that you have with committed contracts, you mentioned it represents 50 percent of the U.S. operating fleet. Is that 90 percent essentially all U.S. domestic reactors or are there any foreign buys in that as well?

MR. SHAKIR: Two-thirds of the capacity is U.S. utilities' contracts. The remaining up to 90 percent is held by our parent company for what we consider to be integrated offers that we make to U.S. utilities as well as other utilities around the world.

As you know, AREVA has a very wide portfolio of products and services that we sell. So, we are currently making integrated offers with other product lines that we have. And some are under negotiation; some are offers, and some to be made.

But from an Eagle Rock sellout standpoint, we are at 90 percent contracted.

JUDGE BOLLWERK: All right. So, these

integrated offers, do you understand what he means by that?

JUDGE LATHROP: I don't understand the two-thirds. Two-thirds of 90 percent?

MR. SHAKIR: No, it's two-thirds of -- so, it's 60, to be exact, 62 or 63 percent are contracts directly with end-users, between AES and end-users, which are U.S. utilities, exclusively U.S. utilities. The remaining 20-some percent are contracts between us, AES, and our parent company, and our parent company will hold the contracts with the end-users because they are multiple-product contracts, if you will, of which enrichment represents one product.

JUDGE LATHROP: Excuse me. I understood that part. But are these U.S. or foreign users?

MR. SHAKIR: Some could be foreign. Ultimately, some could be foreign utilities.

JUDGE LATHROP: And some of these contracts haven't been let yet?

MR. SHAKIR: They are in various stages of completion, if you will. Some are offers. Some are in negotiation.

JUDGE LATHROP: But the parent company has made the commitment to --

MR. SHAKIR: To take that output.

JUDGE LATHROP: To take that output?

MR. SHAKIR: Correct.

JUDGE BOLLWERK: And, in theory, if they can't use it or distribute it, or do whatever they need to, then they would have to reimburse you for the SWU, notwithstanding the fact that they may not need it?

MR. SHAKIR: That's correct.

JUDGE LATHROP: Yes. Okay.

JUDGE BOLLWERK: All right? Any other questions any of the Board members have at this point?

(No response.)

All right. Thank you very much. We appreciate it.

MR. SHAKIR: Thank you.

JUDGE BOLLWERK: All right. Before Mr. Schwartz begins, I would just should mention, again, we are interested in hearing what you have to say. One of the concerns I think we had is, looking at this present situation, it is very hard to tell exactly what is going to happen. There have been 18 or 19 COL applications that have been put into the mix. Of those, I believe five are currently suspended. One has been converted to an ESP. In fact, one of the suspended ones may be converted to an ESP. So, there

is a lot of uncertainty or at least some uncertainty out there about exactly what's going to go forward with the new builds in this country.

And, of course, we have the situation in Germany where both Houses of Parliament appear now to be backing the possibility of not operating all those reactors after a period. The Italians have recently come forth with a referendum that suggested they may not be building any new plants. There's issues with the Swiss, with others, although the Chinese appear to be going forward, at least from the trade press, full bore.

So, we appreciate what information you have to offer us in terms of the situation. And I think the Board's feeling is that this may be something that changes, and what it looks like now may not be what it is later, but we'll take the best estimate you have at this point.

Thank you.

MR. SCHWARTZ: Good morning.

I'm Mike Schwartz, Chairman of the Board of Energy Resources International.

Beginning with slide 2 -- do you have the presentation?

Both Mr. Curtiss and Mr. Shakir stated

that, in June, the Board requested that AES address several issues pertaining to the need for the Eagle Rock Enrichment Facility. My presentation will address how this facility fits into the future need for domestic and non-domestic uranium enrichment capacity.

I will include discussion of the current status of existing and potential future sources of enrichment services. And I will also address the Board's recommended adjustments to the ER installed capacity relative to both our reference and high-growth cases with forecasts for 2020 and 2030, in which we looked at, again, as directed, a 50 percent reduction of the installed capacity forecast, the additional, in the United States, and 25 percent reduction for the forecast of the net additional capacity outside the United States. And I'll also present the results of a recent updated forecast of installed nuclear generating capacity that we prepared.

Turning to slide 3, I would like to begin with the existing and projected enrichment supply for the United States. Overall, the domestic projects have experienced some schedule slippage. Future U.S. supply, as a result, is projected to be slightly lower

than the ER, as was shown in ER Table 1.1-4, which I believe is one of the exhibits.

Just to go through the projects that are currently underway, the Paducah Gas Diffusion Plant, as was originally stated in the ER, the current plan is to simply use that to transition to the ACP with an expected shutdown of that facility sometime during mid-2012 to 2013.

The LES URENCO USA facility is now operational. It's projected to ramp up to 5.7 million SWU per year. It is currently licensed for 3 million SWU per year. This schedule reflects about a one-year slippage from what had originally been anticipated in the ER.

The USEC ACP license was awarded in April 2007, while not yet committed by DOE, an award of a DOE loan guarantee is assumed to occur sometime this year, with initial operation in 2014. And, then, the expectation is that that facility would ramp up to 3.8 million SWU per year by 2018. This reflects a somewhat longer schedule slippage of as much as three to four years.

JUDGE LATHROP: Excuse me.

MR. SCHWARTZ: Sure.

JUDGE LATHROP: If that loan commitment is

not made, would Paducah remain in operation?

MR. SCHWARTZ: It's possible, but I think that, from what we've looked at, given the differences in the technology between gas diffusion and the centrifuge, which is the motivation for moving to centrifuge, to get away from the very high electricity usage and the corresponding costs, in the long-term it may be very difficult to compete in a commercial market with GDP only.

So, yes, I believe that they would certainly continue to operate it for several more years, but it would not be a long-term supply.

JUDGE LATHROP: But ACP will not go forward unless there is a loan commitment, is that correct?

MR. SCHWARTZ: Well, that's a USEC decision, but it certainly appears that the loan guarantee is a critical part of their plan.

JUDGE LATHROP: Thank you.

MR. SCHWARTZ: The U.S. DOE downblended HEU, I believe we addressed earlier. We still see that to be about .3 million SWU per year over the next seven, eight, nine years, but eventually I think that that will go to zero, based on what we have been told.

And, then, of course, there's the Eagle

Rock Facility, which has been awarded a conditional DOE loan guarantee in May of last year, and if an NRC license is awarded no later than 2012, then initial operation would be expected to occur during 2015, followed by a ramp-up based on commercial decisions to as much as the 6.4 SWU per year by 2022. That schedule reflects about a one-year slippage.

The other point that I would like to make is that a difference between the assumptions that are included in this analysis for supply and those that were reflected in the ER, which was identified in Section 1.12.2, bullet No. 2, which I believe also is an exhibit, was that both domestic and non-domestic western enrichers -- and this is our opinion -- will probably be operating at slightly lower levels of supply as a result of operation at lower tails assays.

It's an economic issue. And from what we're seeing when we look at long-term enrichment supply and prices in uranium, which is the other ingredient of the fuel, that may lead to lower tails assay, which results in lower supply to get the same product.

Slide 4 provides a --

JUDGE BOLLWERK: Before you move on to slide 4 --

MR. SCHWARTZ: Yes?

JUDGE BOLLWERK: -- let me ask a question.

MR. SCHWARTZ: Yes.

JUDGE BOLLWERK: My recollection is that the ER did mention the GE Hitachi facility, and we don't see any mention of it in this slide.

MR. SCHWARTZ: Sure.

JUDGE BOLLWERK: I'm sort of interested in that, why, why that was the case.

MR. SCHWARTZ: Sure. The ER identified GE Hitachi not as part of the base supply, which is what we are dealing with, but as a potential additional source of supply. GE Hitachi has continued to pursue that project. There has been slippage in their schedule. They are still in a test sloop, and they have also submitted a license application to the NRC.

However, they have not made a decision to go forward with that facility. So, we see that as a difference, and that was the reason that we did not include it in the ER as part of our base supply, and we use that same approach consistently in all of our work.

JUDGE BOLLWERK: And how do you consider that -- and I think I know what you are going to say, but I will ask anyway -- how do you consider that

different from the ACP then?

MR. SCHWARTZ: ACP we look at as being a situation where USEC has clearly stated their intent to go forward with that project. In this case, they have the license, but this is subject to the loan guarantee or financing more broadly.

JUDGE BOLLWERK: Let me turn to the staff. Do you all see a difference between GE Hitachi and ACP in terms of this sort of analysis?

DR. BIWER: ACP has had some problems with their centrifuges, and I believe they have corrected most of those problems. They're developmental. They are developed in the United States; whereas, AREVA is using the technology that has been used in Europe for 30 years.

GE Hitachi, as Mr. Schwartz said, also has not demonstrated that the laser-based uranium separation is actually commercially-viable yet. They do continue to pursue their license. Beyond that, I really can't say anything else.

JUDGE BOLLWERK: All right. Well, I recognize that the staff's EIS for the GE Hitachi facility has not yet been issued. And, obviously, it is delayed now until the fall, or is it the beginning of next year? I don't remember the exact date.

But, I mean, arguably, what we are hearing here today rolls down GE Hitachi's hill, if that's the case. If some of the figures we are seeing are, suggested, say, that the AREVA facility fills things up, what does that do to GE Hitachi? Maybe that is not a question you can answer, but it certainly seems to be one that is going to be of some concern there. Am I speaking out of turn or out of school?

DR. BIWER: No, I mean I think that's reasonable. I mean, at the moment, you have the imminent shutdown of Paducah. I mean one of the problems they are having there is it is old equipment, and they would have to do a fair amount of refurbishment to keep it running for many more years.

You also have, again, the Russian agreement, which was originally signed with the U.S. under a fixed price. Now I don't have the new numbers, but one of the reasons I believe that the Russians may not be interested in it and that they are not going to be locked into the agreement, prices of uranium have gone up and there's demand in other parts of the world.

And outside of the Paducah plant going out of business, we don't have the capacity in the United States to support the nuclear fleet, which is

obviously a problem when you look at, say, the oil prices, for example, in another energy sector, where we don't have the production to meet U.S. demand and that has caused price problems with the economy. And I think there's a similar thing here.

JUDGE BOLLWERK: All right. Well, again, that is a separate case and you all, obviously, will have to deal with it in the context of that case. But some of the figures we are hearing here suggest that we are getting near capacity. Again, I guess that is something we will have to deal with in our decision.

All right. I interrupted you. I'm sorry. You were just about to finish with slide 3.

MR. SCHWARTZ: I believe I have concluded slide 3, and I was going to move on to a parallel slide 4, which addresses existing projected enrichment supply outside the United States.

Again, what we have seen is some small slippage in schedules. There are other projects that have moved forward more quickly.

Just to summarize briefly, URENCO in Europe, operations and expansion continue. Their steady-state annual capacity of 14.5 million SWU is what we are expecting by 2015, which is about 2 million SWU per year greater than what is included in

the ER.

AREVA, George Besse I, which is the gaseous diffusion plants, there's similarities in a sense with Paducah in that they are using older, more expensive technology. Their stated plan at present is to operate through 2012 at low levels and use inventory that has been generated in advance to support the transition to the new GBII, George Besse II centrifuge plant.

And leading into that, George Besse II became operational in April of this year. Continued ramp up to 7.5 million SWU per year is expected to occur by 2017.

Rosatom, which is the Russian supplier of enrichment services, expansion continues pretty much as expected. The HEU Agreement, as previously stated, will end in 2013. There are sales in both the U.S. and Europe that are constrained by trade laws, and contracts, executed support, limited access to the U.S. and elsewhere have been put in place.

The assumptions that we made with regard to recycle are largely unchanged. That is recycle of the discharged fuel which can be reprocessed using the plutonium and uranium to somewhat offset the need for additional enrichment services, just to give a little

background as to what recycle means.

So, that is where those projects stand. The major change, as we see it, outside of the United States, and certainly with regard to our view on enrichment supply, is in China. Our expectations for indigenous Chinese enrichment capacity have been increased quite significantly since we prepared the ER, and we see them as meeting a much larger share of their internal requirements, consistent with the approach that they have been taking for other parts of their nuclear fuel cycle, whether it is the technology for the power plants or it is the fuel fabrication.

So, we felt that it was appropriate to increase our expectations there for what will actually come out of China, as opposed to looking at that as a sink or a source of requirements for others to supply.

JUDGE BOLLWERK: One quick question on this slide.

MR. SCHWARTZ: Yes.

JUDGE BOLLWERK: Given the statement you have about the Russians in, I guess it's the fourth bullet under the first bullet, and what we heard in the previous presentation about the concern about expanded Russian sales in the United States, how do those two mesh together?

MR. SCHWARTZ: Sure. What we see happening in the United States at this point is, as a continuation of the suspension agreement, and actually it was put into law -- it has been referred to as the Domenici Amendment -- Russia is allowed to, and they have started small amounts, but, effectively, beginning with the conclusion of the HEU Agreement, they will be allowed to sell up to 20 percent, meet up to 20 percent of U.S. requirements for enrichment services through direct sales to the electric utilities in the United States.

So, they have already begun to fill those contracts, and that is reflected in our analyses. We basically set aside 20 percent as what they are going to supply to the United States.

JUDGE LATHROP: But that assumes that they meet the price, right, that the U.S. would buy from the Russians because of favorable price?

MR. SCHWARTZ: Yes. Their pricing has to be competitive in order for them to make those sales, that's correct.

JUDGE LATHROP: To return to the HEU question, the staff just remarked that the present agreement is a fixed-price agreement. Would Russia consider selling more HEU if the price were right?

MR. SCHWARTZ: Well, there was a renegotiation that took place in the last several years between USEC and Rosatom, or TENEX in this case, which is the exporter for the Russian material, which resulted in an adjustment to the price for enrichment services coming out of Russian as part of that HEU Agreement.

And that price was actually designed to reflect a percent of market price. So, the idea is that USEC would pay, and the Russians would receive, a fair market price that was reflected by published indices that supposedly reflect transactions for previous sales over the last several years. And that pricing mechanism will remain in place through the end of the HEU Agreement, which is 2013.

The pricing for any future sales to U.S. electric power companies will be prices as negotiated directly between the Russians and those companies, which would be intended to be competitive with what other suppliers would be providing.

JUDGE LATHROP: What you have said suggests that the Russians desire not to sell any more HEU, indicates that they would rather sell enriched uranium in the world market rather than provide HEU, because they, I believe, have ample supplies of HEU.

MR. SCHWARTZ: Yes. Our understanding, and based on comments that have been made, is that they see the HEU as maybe a national resource, and they really would prefer not to be continuing to sell that.

I think, more significantly, what they would like to do is be able to make greater use of their commercial capacity, which is larger than what they are able to sell in the market because of both U.S. and European Union trade constraints. So, what this new arrangement does is allow them to sell from their production, EUP, as you say, and the enrichment component associated with it, directly to the end-user.

JUDGE LATHROP: Thank you.

MR. SCHWARTZ: In summary, then, what we are seeing is a small increase in capacity. I would characterize it, and, again, trying to allow for comparison with the ER, during the overall 2016-to-2030 time period, which some of the ER tables made use of, in the United States we saw an overall average annual reduction in enrichment supply capacity of less than a million SWU per year. Overall, outside of the U.S., the corresponding number would be an increase of about 4 million SWU per year. So, those are the

numbers that we will subsequently use in the analysis that we will describe shortly.

Turning now to slide 6, I would like to address the adjusted forecast of installed nuclear capacity, as requested by the Board, for 2020 and 2030. The Board-requested adjustments to the forecast of increases in installed nuclear capacity in the ER resulted in reductions, as would be expected, in the installed world capacity of between 5.5 percent in our reference case for 2020, all the way up to about 13 percent for a high-growth case in 2030.

The table that you see -- I guess we need the next slide. I'm sorry. Slide 5. I misspoke. Thank you.

The table here presents the numbers that are in the ER both for the U.S. and the world for 2020 and 2030 for both the reference and high cases, and is a basis for comparison, so that you can see how those changes affect installed capacity.

And just to --

JUDGE WHITE: Excuse me.

MR. SCHWARTZ: Yes.

JUDGE WHITE: Could I ask one question about these forecasts, which was discussed previously, obviously, are fraught with uncertainties anyway?

MR. SCHWARTZ: Sure.

JUDGE WHITE: But am I correct in assuming that the high-growth forecasts make the assumption that there will be no unforeseen events that would adversely affect the growth of nuclear capacity?

MR. SCHWARTZ: The difference between the reference and the high growth, and at this point we are looking back at the ER, but the same rules apply.

JUDGE WHITE: That's what I think.

MR. SCHWARTZ: The reference forecast, as we generate it, is basically bottoms-up looking at individual projects, different countries, and it is our judgment as to whether there will be delay, whether projects will go forward at all, and just reflects our best judgment on each project.

The high-growth case, which, as you suggest, are based on the sponsor, the project sponsor or in some cases it is the national electric power company's statement of what they intend to do, although in some cases we actually will ratchet that back to something that we think is more reasonable, maybe based on the history that has been demonstrated where a country or company has consistently said that they are going to do such-and-such, and it just never materializes or it is always delayed. So, we will

make those adjustments.

But I guess, in answer to your question, we don't assume that there are further unforeseen events that would happen in preparing that high-growth case.

JUDGE WHITE: It is called to foresee unforeseen events.

MR. SCHWARTZ: Yes.

JUDGE WHITE: On the other hand, however, just for clarification, is there any provision, or is it possible that unforeseen events could adversely affect other energy sources, which, in fact, would have a positive effect on nuclear growth beyond your high-growth estimate?

MR. SCHWARTZ: That's always possible, but, I mean, we have not ventured as far -- I mean, usually, the way we would describe, for example, one of the descriptors in the high-growth forecast would include a strong recognition of the role that nuclear power can play to offset greenhouse gas emissions. But to say that there is something that goes beyond that, you know, we haven't included that.

JUDGE WHITE: But it would be possible that unforeseen circumstances, political, for example --

MR. SCHWARTZ: Sure.

JUDGE WHITE: -- could, in fact, make the high-growth forecast actually lower than what actually might happen?

MR. SCHWARTZ: Quite true, yes.

JUDGE WHITE: Thank you.

MR. SHAKIR: If I may, Your Honor, I would just add one thing that would tie to that question.

JUDGE WHITE: Yes.

MR. SHAKIR: Certainly, in this country we don't have carbon legislation. Carbon legislation would be one that could potentially have a very significant impact on the demand for nuclear.

JUDGE WHITE: Yes. Thank you.

MR. SCHWARTZ: The final point that I wanted to make with regard to slide 5 was simply that, as we all recognize, the adjustments made here at the Board's request were prescriptive. And what we have found, and we will discuss this further later, is that the couple of forecasts that have come out post-Fukushima that indicate that they reflect the best possible, and as you have rightly pointed out, there's still a lot of uncertainty, result in higher levels of installed nuclear generation than those that we get just using these adjustments. But we will talk about that further later.

Next, what I would like to do -- and now I would like to move to slide 6 -- is what we did was to carry the math through from installed generation through to the enrichment requirements. And that is what we are discussing here in slide 6.

The result of that is that, when one looks at the reference growth assumptions on a world basis, we see an average annual reduction in enrichment requirements of 5.3 million SWU per year, which is about 8.2 percent of world requirements during that period. And in the high case, the reduction was about 9.4 million SWU per year, a little over 11 percent. And these are values that would be comparable or compared to what was found in the ER Table 1.1-3.

And as one might expect, the other forecast for installed generation would correspondingly have higher requirements associated with them for enrichment services as well. But, again, we will talk about that further.

What I would like to move into is now the issue -- and this is looking at slides 7 and 8 -- where now what we are looking at is the impact on the relationship between supply and requirements. We previously talked about supply, and now we have addressed the Board's assumptions for requirements.

But to look at that for the U.S. and the world, respectively, based on these new assumptions, and that's what you have here. We will talk about slide 7 first, which is the U.S., and then we will move on to world, which will be slide 8.

What you see here -- and it is probably best to simply look at the table -- if we look at the numbers for ER, and what we have provided is, for this period 2016 to 2030, we have looked at the base supply, which, again, is done on a consistent basis with the ER, both reference and high cases, and then, also, the base supply eliminating the Eagle Rock Facility.

And what you see there, for example, in the ER we had a deficit in the sense that there was less supply than requirements in all of these different cases, whether we are looking at the base reference case or the no Eagle Rock high, and the numbers just change.

When we make the adjustment for the 50 percent by reducing the net increase in installed generation by 50 percent, we still find ourselves in the same situation. Overall, though, what we see is that the supply has come down by a little less than a million SWU per year on average, and the requirements

have also come down by about the same in the reference case. And as a result, you see the numbers are very similar.

The other is the high case. And in the high case, what happened was, again, supply comes down by a little less than a million SWU per year, but the adjustment requested by the Board resulted in a reduction of enrichment requirements in the U.S. by about 1.4 million SWU. So, you see there that there's been just a slight or, you know, a little bit more of a change in the deficit.

Okay. Looking at the world now -- and what we have done, the same format is used in this table -- what we have from the ER, as you may recall, and this was in Table 1.1-6, was in all cases, once again, in the world we saw a negative or a deficit. The supply was not enough to cover world requirements.

When we make the adjustment requested by the Board, which was the 50 percent adjustment for the increase in the U.S. and 25 percent adjustment increase outside the U.S., what we find happens is that the base and the no Eagle Rock under base case assumptions are positive. Again, with the high-case assumptions, we have a deficit. So, that was the adjustment that resulted from the requested change in

approach to installed generation.

Next, I would move on to the recent analysis and forecast that we prepared. This is beginning on slide 9.

JUDGE BOLLWERK: Just to make it clear, when you use the Board's numbers, for the base case, the base reference case, and the no Eagle Rock reference case, there is actually more, well, more capacity than there is need for the services, correct?

MR. SCHWARTZ: That's correct. I mean just looking at the numbers, that's true.

JUDGE BOLLWERK: The numbers, correct.

MR. SCHWARTZ: It doesn't get into the issue of, you know, what are the risks of different facilities going forward, things like that.

JUDGE BOLLWERK: Right.

MR. SCHWARTZ: But, yes, that's correct.

Okay. Continuing on slide 9, in May of 2011, ERI prepared a forecast which reflects events that occurred subsequent to the submittal of the ER several years ago. These events include the impact of the Fukushima accident, for which we certainly see significant reductions in Japan and Germany, but, actually, minimal impact on the rest of the world, when compared to what we had in the ER. And we can

talk about that further.

In the U.S., license renewals are continuing, power uprates are continuing. Expansion of nuclear power in China is continuing and is very significant.

On the other hand, there clearly has been a downturn in the world economy in the last several years. There is also a renewed interest in what appears to be low-cost natural gas. New nuclear power plant projects are clearly having difficulty in obtaining long-term financing.

Overall, though, what we find is that there are continued statements appearing each day, and as recently as earlier this month, from a variety of countries and individuals supporting nuclear power and continued interest in moving forward with many nuclear power programs.

These are all part of what goes into our forecasts. So, it is not just Fukushima. It's all of these factors.

Overall, we find that our forecast is still conservative. And you may recall in the ER our numbers were slightly lower than what others were forecasting. I think they were more optimistic at that time than we were about what was going to come

out of this resurgence in nuclear power, both in the U.S. and worldwide. But when we compare our numbers to other post-Fukushima forecasts with respect to long-term installed nuclear generation, our numbers are still on the low side.

What we did next was, then -- and this is reflected on slide 10 -- is to look at what the impact was on U.S. and world enrichment supply relative to requirements as a result of these new forecasts that we had prepared. And, as summarized here, we find that the average deficit, now looking first just at the United States, increases slightly. I am not going to claim to have the precision to say that that's a significant adjustment from .8 to 1.1, but it certainly continues to support that there is a deficit and it is of about the same magnitude and, if anything, it is somewhat larger than it was in the ER. And that if one looks at the case without the Eagle Rock Facility, the deficit is clearly much larger.

We also looked at in the high forecast the same sort of cases. In the U.S., we saw a slight increase from the 1.6 million SWU per year deficit that appeared in the ER to 2.1 million SWU per year that we show here. And once again, if we remove Eagle Rock, the deficit becomes even larger.

Moving on now to the world, the same sort of analyses were --

JUDGE BOLLWERK: Stop there one second.

MR. SCHWARTZ: Certainly.

JUDGE BOLLWERK: Why, given what has happened with Fukushima, does the deficit, you find the deficit increases from what the ER is now?

MR. SCHWARTZ: Sure. As I tried to explain in slide 9, there are a variety of different changes that are reflected in our forecast, the most significant being China. What we found was, if we isolate China and just compare the rest of the world, between what's in the ER and what's in our most recent forecast, we find that there is a decrease. And I won't attribute it all to Fukushima, but there is a decrease, and all of these factors contribute to it one way or the other.

However, we were very conservative when we did the ER with regard to China. There was a lot of talk and a lot of statements, but we had seen very little actual building going on. And so, we have been watching that over the last several years and increasing what we believe is reasonable for both reference and high case. It is still lower than what they are claiming they can do, but it is substantially

higher than it was in the ER.

So, quite simply, what has happened is any reduction in our forecast for installed nuclear power which would be the result of Fukushima, economics, low-priced gas, you know, difficulty in financing -- those all overall would bring it down -- has been less than the increase that we added as a result of what we see going on in China.

JUDGE BOLLWERK: All right. Then, we have got the American domestic market and we have the Chinese. How does what is going on with China affect the American domestic market?

MR. SCHWARTZ: It doesn't affect the domestic market other than to -- it is a global market. If China was not -- if China requirements continued to increase significantly as a result of their adding nuclear generation, which is what we anticipate, but if they were to, instead of building their own enrichment plants, rely on other suppliers, then what would happen is they would be siphoning off, I mean some of the production that would be coming out of these other plants that we described earlier would be going to meet the Chinese needs. That was more in line with the assumptions that we were making in the ER.

Now what we have assumed is that they are actually going to be generating more enrichment services indigenously, and, therefore, the way that impacts what happens domestically is it now increases the total amount of supply that may be available to serve the U.S. market. But, again, that is just the supply side. In total, when you look at the increase in Chinese requirements, the net it such that, you know, it kind of moderates that effect.

JUDGE BOLLWERK: All right.

MR. SCHWARTZ: And, then, the final two bullets on that slide were simply to identify the fact that, based on our analysis, supply does exceed world requirements or mathematically would exceed world requirements by about 3.2 million SWU for the reference case over that 2016-to-2030 time period. But, then, when we look at the high-growth case, we find that there is a significant deficit, in that supply is less than requirements by over 6 million SWU per year.

If we look at the situation without the Eagle Rock Facility, what we find is requirements on a world basis do, indeed, exceed base supply without the Eagle Rock Facility for both the reference and the high case.

So, what we find when we look at this, and then we look back at what we did in the ER, is that, overall, the results are actually very similar to what was in that report.

In conclusion -- and this is summarized on slide 11, and it really is a restatement of the last slide -- with the Eagle Rock Facility and all the other U.S.-based supply that was identified, requirements for enrichment services are expected to exceed U.S.-based supply over the long-term, and that applies to both the reference and the high case. And if one eliminates Eagle Rock from that picture, it simply results in an even larger deficit of supply relative to requirements in the U.S.

And now, looking at the world, again, if we look at the base supply with the Eagle Rock Facility in the picture, we find that world supply would be expected, if all projects go forward exactly as projected and requirements are as they are, would be expected to exceed world requirements in the reference growth case. However, the requirements associated with the high-growth case would exceed supply that we would be projecting.

However, when we, then, say, okay, well, what happens if we take the Eagle Rock Facility out of

the picture, on a world basis there's once again, as with the ER, a net deficit of supply relative to requirements.

JUDGE BOLLWERK: All right. Judge Lathrop, you look like you were ready to say something.

JUDGE LATHROP: I have some questions about the nature of the forecasting business.

MR. SCHWARTZ: Sure.

JUDGE LATHROP: How often do you revise your forecasts?

MR. SCHWARTZ: We do a complete forecast like this once a year.

JUDGE LATHROP: And you must keep records of your past performance in forecasting?

MR. SCHWARTZ: We certainly do and requested to do so. I mean we have had that question.

JUDGE LATHROP: This is your chance to brag.

(Laughter.)

MR. SCHWARTZ: Yes. Yes. I would only say that I think that our forecasts have been pretty reasonable over the years, and we are pleased with what we were able to do.

JUDGE LATHROP: Were you in the

forecasting business for Three Mile Island, at the time of Three Mile Island and Chernobyl?

MR. SCHWARTZ: Yes, we were doing the same work then.

JUDGE LATHROP: How did you handle your forecasts? How well did your forecasts handle those discontinuities?

MR. SCHWARTZ: Well, I think what I would do, I mean we have a range of forecasts, and it certainly was in the band. I certainly don't remember where we fall, and I would be hard-pressed to say that, you know, the reference hit it.

But I think it is worth, just to add a little bit of perspective here, because this is a question that comes up in all forms, and we have had to address on a regular basis, that, overall, what we are seeing from the perspective of what is the impact of Fukushima specifically, and only Fukushima, on long-term fuel requirements, which would include enrichment services, we are looking at numbers that are on the order of 3 percent. And where we haven't seen too many people actually say, "This is what we believe the impact of Fukushima is," but, where we have, the one or two others, they were characterizing it as 5 percent.

And, also, there was a recent statement made by another organization that actually went as far as to make the point that they don't believe, and we would agree with this, that the impact of Fukushima will be as large as the impact of Three Mile Island or Chernobyl on the industry.

JUDGE LATHROP: Good. Thank you.

MR. SCHWARTZ: Thank you.

JUDGE BOLLWERK: Judge White, do you have any questions?

JUDGE WHITE: No, no additional questions. Thanks.

JUDGE BOLLWERK: At this point, we are about where we needed to take a break. I don't know that we are necessarily finished with this panel. I want to think about what I have heard a little bit over the lunch period, if that would be all right with the panel, with the parties.

So, why don't we go ahead and take lunch?

And let me ask one question of staff before we take our break. We have heard from the first presentation that, basically, they have sold 90 percent of the first 3.3 -- was it? -- million SWU. What is the staff's feeling about that sort of analysis in terms of the need requirements that is

underneath that? Does that answer the question?

DR. LEMONT: That's an interesting question.

JUDGE BOLLWERK: It is.

DR. LEMONT: I mean, you know, we didn't really look at it from that standpoint. I mean in the EIS we looked at the information that was provided in the Environmental Report.

JUDGE BOLLWERK: The Environmental Report takes a very different approach. It basically looks at an overall picture. Basically, the first presentation says, "We've sold all this. What's the concern?" Which one do you like or --

DR. LEMONT: As I was saying, we looked at -- we're not professional forecasters, as Mr. Schwartz is. We did an independent analysis of our own, based on other facts that are available, for example, from the Energy Information Administration.

You know, taking a different approach, we reached somewhat similar conclusions that AES reached in its Environmental Report.

The information that Mr. Shakir presents in terms of contracts that he already has is interesting, but we didn't base our analysis on that. We can't really comment on that because we don't have

that information at our disposal to analyze.

JUDGE BOLLWERK: Well, I mean, you have his statement. Now he's under oath. So --

DR. LEMONT: I think that that information --

JUDGE BOLLWERK: He said what he said.

DR. LEMONT: That information shows that certainly the need for the EREF appears to be justified for the period of time through 2028 for the 3.3 million SWUs.

JUDGE BOLLWERK: All right. And in terms of what we have heard in the second presentation, again, sort of information was provided in the ER, to some degree, modified by recent events. Any comments that you have in terms of the analysis that the staff put forward in the FEIS?

DR. BIWER: Well, it is, understandably, a world economy with the uranium. But one of the things we were also looking at were the national security concerns within the U.S. and the actual production within the borders of the country.

And with the shutdown of the Paducah plant in the next few years, and the uncertainty with the other plants coming online, we felt that there was a reasonable need. And I think what the contracts that

Mr. Shakir has spoken about today supports that need, and that facilities that are using the uranium, in this case the utilities, see the need in the long-term that will come from other providers. In this case, it would be AREVA and the EREF.

JUDGE BOLLWERK: All right. Any questions either of the Board members have relative to what I have just --

JUDGE LATHROP: No, no further.

JUDGE BOLLWERK: All right. Let's do this: it's about quarter to 12:00, and I do want to avoid any problems with the folks next door in terms of noise. So, let's go ahead and take our lunch break now, until about 1:15.

I don't know if I am going to have any more questions for the panel, but I want to think about it a little bit, and we will come back and we may have some additional information we will be seeking from you all. All right?

So, let's say, why don't we come back about 1:15 from our lunch break?

Thank you very much.

(Whereupon, the foregoing matter went off the record for lunch at 11:41 a.m. and went back on the record at 1:15 p.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

1:15 p.m.

JUDGE BOLLWERK: All right, if we would go on the record, please?

We're back after our noontime break, and I understand that our next-door neighbors have sort of wrapped up there event. As I came in, they were clapping, and I am sure everyone enjoyed the applause, but not necessarily for us, I guess.

I think what the Board would like to do at this point is we would like the witnesses to come back up. I have a couple of other questions.

And while we are talking to the witnesses about the presentations, I would like to sort of give staff and applicant counsel something to think about, and perhaps give me your views when we are done talking with the witnesses.

And this is not a question that necessarily -- it was raised last night at the limited appearance statements, and I am just sort of interested in your views on it, which is the question of whether, under 51.92(a)(2), there is some need to supplement the Environmental Impact Statement, given what has happened with Fukushima and this question. All right. Again, it is something you can think

about, and I will come back to you all, maybe in the next five or ten minutes, after we have talked with the witnesses.

Gentlemen, thank you for coming back. The fact that you had a good lunch doesn't mean you're off the hook, I guess. You're still under oath, and I am going to talk with you a little bit more, as well as perhaps the other judges.

I guess I wanted to go over the slide presentation one more time in sort of a summary fashion, just to make sure that I have pulled this all together in my mind in terms of what the Board was saying and, also, what you all were saying, particularly with respect to slide presentation No. 2.

Going back to, I guess, slide No. 2, the Board's idea of a 50 percent reduction in installed capacity and a 25 percent reduction in installed capacity, one being domestic and one being U.S., to sort of look at it again in a more gross way, I think our premise was that there would probably be, perhaps on the U.S. side, more of a delay in terms of the COLs. Perhaps on the foreign side, it might actually be some existing installed capacity, like the German situation, where it would actually go offline.

But, in any event, it wasn't clear to us

what it would be. As a stress-test matter, we thought, though, however, we would use those gross percentages.

The one thing we did not really say anything about, and you have supplied some information on, was the question of existing supply. We had assumed, I guess, what we saw in the ER was basically the same. If you look at slide No., well, No. 4, I'm sorry, Nos. 3 and 4, you have talked about domestic on No. 3; you have talked about foreign on No. 4, and the bottom line being, though, the final bullet on the slide, on page 4 of the slides, that with respect to domestic and overseas, really, there is little change in expectation regarding supply with the exception of China, China being the major change in terms of the number of SWU that might be produced. So, essentially, the supply stays the same, but for the Chinese.

And I guess looking at it, again, in an overall sense, that large increase could come into play in terms of perhaps some domestic capacity or meeting some domestic requirements, depending on what the Chinese needed, but it would not, from the staff's perspective and what we heard from AREVA in terms of the policy of having domestic production available,

that would not answer that question. It would not be the sort of thing -- as a policy matter, we would not want to, just like we wouldn't want to buy from the Russians, we wouldn't want to buy from the Chinese.

Is that a general statement in terms of the policy to encourage domestic production? Anyone want to comment on that? Am I in the right ballpark?

MR. SHAKIR: I think the policy has been consistent in terms of increasing domestic capacity, which implies that reliance on foreign supply of enrichment is not something that the United States wants to have continue.

And I know I mentioned and, you know, we made reference to the press release where Secretary Chu made a statement there. And there has been some other specific statements made by other officials that we don't necessarily have all the exhibits here, but we do have another exhibit that was presented by NRC -- I think it's 161 -- where Shane Johnson, who is the Chief Operating Officer, Nuclear Energy, for the Department of Energy, also makes references to the need for increased domestic capacity.

I also want to point out, too, that Mr. Johnson refers to $4 billion of loan guarantee authority that DOE is making available for enrichment

facilities. That is twice the amount that was originally in the 2005 Energy Act. So that DOE in 2010, just last year, decided the need to increase that authority to $4 billion to make that available for additional enrichment capacity.

So, consistently, they have viewed the need for domestic capacity to be important and critical for us here, for the 104 reactors, but, also, to position the United States possibly for being ultimately an exporter of such services to other programs.

JUDGE BOLLWERK: All right. But, again, back to my original question, Chinese, Russian, French, it doesn't make any difference in terms of that policy?

MR. SHAKIR: Correct.

JUDGE BOLLWERK: All right. All right. Having said that, then, we come to slide 5 and it sort of takes the information that the Board asked you to generate in terms of the ER tables that were there, the ER information that was there, your Environmental Report information, and gives sort of the adjustments to the installed capacity, both in the United States and in the world, and using 2020 and 2030, both the reference case and the high case for sort of putting

that all in one table. And that is sort of what we had anticipated, seeing something like that.

Although you make the point in the final bullet that our adjustments go much beyond what the recent post-Fukushima forecasts of installed nuclear generation would suggest is going to be appropriate. And that's a fair point from your perspective.

Then, we move on to -- let me skip forward here to slide 7, where, I guess using these adjustments, there is a base reference, a base high, and, then, without the Eagle Rock Facility, both a reference and a high requirement for supply that are shown. And I guess the basic point being that, on the base reference case, it is really about the same, whether you take the ER or you take our adjustment in terms of it. And, then, on the high case, the requirements actually are a little less, is that correct?

MR. SCHWARTZ: Correct. For the U.S., that's correct.

JUDGE BOLLWERK: And again, with no Eagle Rock Facility, again, between the ER and the U.S. requirements, they were less for our adjustment and slightly, again, less for the high case.

And, then, I guess you did the world, the

table on page 8. There were two instances there where there appeared to be, the supply actually appears to be higher than the requirements, using our adjustments in the base reference case and the no Eagle Rock reference case.

MR. SCHWARTZ: That's correct.

JUDGE BOLLWERK: That's correct as well?

MR. SCHWARTZ: That's correct.

JUDGE BOLLWERK: Okay. So, then, we come to slide No. 9, and this deals with your analysis of the forecast of events subsequent to Fukushima. And you make the point that, in terms of the effect on installed nuclear generation capacity, that you expect the most significant reductions in Japan and Germany, but minimal impact on the rest of the world when compared to the ER.

So, your premise, then, is that, with respect to the United States, that Fukushima is going to have very little effect, I guess either with respect to operating plants or with respect to new-build plants or COLs? Is that --

MR. SCHWARTZ: In the context of their requirements for fuel supply, yes.

JUDGE BOLLWERK: Okay.

MR. SCHWARTZ: That's correct.

JUDGE BOLLWERK: All right. But, potentially, significant reductions in Japan and Germany?

MR. SCHWARTZ: Correct.

JUDGE BOLLWERK: And what, if anything, did you take into account in terms of, for instance, we have been hearing about the Swiss, about the Italians, the Spanish to some degree?

MR. SCHWARTZ: Sure. For example, the Swiss, you know, they have made their announcement of their plans, but for the most part that doesn't really result in plants coming down until you get into the late twenties, if not, I think, even the early thirties. I mean it doesn't really apply to this and the numbers are fairly small.

As far as some of the other countries go, you know, it was never really clear to what extent they were going to build out anyway. So, when we have done our analyses in the past, even though some of these countries have announced that they are maybe going to be aggressively pursuing nuclear power, we have applied some judgment to that as well, and in some cases we have said probably not likely, not for our reference case. In other cases, we may have pushed it off in time.

JUDGE BOLLWERK: All right. And, then, in terms of the U.S. license renewals and power uprates, I think the basic premise you are working off of is that this is going to basically increase at the current rate, approximately?

MR. SCHWARTZ: I think so. I think, at the most, what we are seeing is that there may be some amount of delay associated with going through the reviews that are taking place right now, which would apply in the U.S. and outside of the U.S. But, then, beyond that, our belief is that that will continue.

JUDGE BOLLWERK: All right. And, actually, you have made the point, I guess, that with respect to the Swiss, for instance, that if there is an effect, it may be well down the road. I think one of the things that was concerning the Board is, if you look at what happened, for instance, after Three Mile Island, things still happened, but the whole timeline just was extended. So, you began to push things further and further out. We are dealing with 2020 and 2030. Things move down the line. Maybe eventually they get built, but the question is, what's the need for the capacity right now?

MR. SCHWARTZ: Correct, and that is exactly what we have done in each of these cases, is

to look at that sort of situation. Japan is a very good example. Some of the units that were under consideration we have assumed may not get built. Others we have said will probably be significantly delayed, depending on where they stand. So, that's quite accurate.

JUDGE BOLLWERK: All right. You also mentioned on slide 9 the continued expansion of nuclear power in China which is significant. So, it looks like you had two assumptions. One is that, in terms of supply growth, the Chinese were going to be producing it; in terms of demand or requirements, it would also be the Chinese that would have a significant increase.

MR. SCHWARTZ: That is correct.

JUDGE BOLLWERK: All right. And, then, the downturn in the world economy, that, again -- go ahead.

MR. SCHWARTZ: That's contributed to a situation where a number of the companies, even in the U.S., for example, that have plans on the board and are going through the licensing process, expecting to build new plants, have indicated that there may be delays. And I think that you had made that point.

JUDGE BOLLWERK: Right. For instance, the

Callaway Facility, which is currently suspended, is actually talking about only a site permit. So, that, again, would be part of that drawing-out process, not necessarily stopping it, but pushing it down the line?

MR. SCHWARTZ: Correct.

JUDGE BOLLWERK: All right. Renewed interest in low-cost natural gas, which would tend to suppress the demand to some degree.

MR. SCHWARTZ: Right.

JUDGE BOLLWERK: And, then, the financing question, again, would tend to suppress the demand?

MR. SCHWARTZ: Correct.

JUDGE BOLLWERK: And I guess you have mentioned, and this has happened with the United States and others, that notwithstanding what has happened with Fukushima, there is still within a number of governments, official support for nuclear power, although others, like Germany, have taken a different tact?

MR. SCHWARTZ: That's correct.

JUDGE BOLLWERK: All right. And I guess you have an overall -- the last point about, nuclear power remains strong within those government that are still moving in that direction?

MR. SCHWARTZ: That's correct also.

JUDGE BOLLWERK: All right.

MR. SHAKIR: Your Honor, if you allow me, I would like to just elaborate on a couple of things.

JUDGE BOLLWERK: Sure.

MR. SHAKIR: Because when we look at the world market and we look at the growth in the new builds, and I want to reiterate that we did not base our business plan on new builds, but when you look at the new-build market, it is primarily China and India. And both of these programs are moving forward.

The ones and twos of reactor projects in Europe are pretty minimal. And in fact, they were only going to offset some shutdowns that were planned anyway.

So, really, when you look at the total picture in terms of new builds, the majority of these projects are moving forward because they are all in these countries of China and India, recent program announcements in the UAE, others like Turkey, Jordan, even Saudi. They all have pretty solid plans to move forward with their programs.

So, the decision by Germany is not a surprise. If everyone remembers, at the time we submitted the ER, the policy in Germany was they were going to shut down their reactors. They, then,

changed their mind, and now they have changed their mind again. So, we don't really know, between now and 2022, how many more times they will change their mind.

But the bulk of the programs that have the majority of these new builds are in countries that are moving forward.

JUDGE BOLLWERK: All right. Again, with respect to the domestic United States market, I guess your point is that you are looking to the currently-built facilities in any event to give you the majority of the services you are going to be providing?

MR. SHAKIR: Absolutely. This plant, the basis for this plant was the current fleet. I have said that before, but I want to emphasize that. It is the current fleet, and the current fleet, we don't see any indications of that fleet reducing in size or, you know, as a result of Fukushima or any of the other impacts that are identified here.

JUDGE BOLLWERK: All right. Then, let's move briefly to slide 10, and this is where I want to kind of wrap this all up and try to get to the overall picture. We had, I guess other than with China, basically supply remaining the same. And it sounds like that basically a minimal impact with respect to Fukushima, other than perhaps Japan and Germany.

So, when you update your analysis in the Environmental Report, what we actually end up with is an additional, not a huge one, but an additional supply deficit. That's the second bullet.

MR. SCHWARTZ: For the U.S. Sorry.

JUDGE BOLLWERK: For the U.S., right.

MR. SCHWARTZ: Yes. Correct. Correct.

JUDGE BOLLWERK: So, actually, notwithstanding the fact that Fukushima has had some impact, we are actually have a greater deficit in supply?

MR. SCHWARTZ: Slightly --

JUDGE BOLLWERK: It seems somewhat counterintuitive, and I guess that is where I am trying to -- maybe you can help me with that.

MR. SCHWARTZ: Sure. You know, again, I would say that the way to look at that is that, one, the original ER itself was fairly conservative with regard to both supply and requirements, in that supply we were trying to make sure we weren't leaving things out that should be in there.

The change in supply in that case is less than a million SWU, based on our new analysis, which is a very, very small incremental change. And to put too much attention on the precision there I think

would misrepresent how well one can do a forecast.

Similarly, on the requirements side, what we have there over this period of time is also a very small change. In this case, it was something on the order of like 700,000 SWU out of 15 to 16 million per year on average. So, again, we are looking at small changes.

For the most part, we are saying that, if anything, it goes down a little bit. For the most part, I think the real message is, as far as the U.S. is concerned, Fukushima did not, and we're not expecting it to, impact the long-term picture for nuclear power and the fuel requirements that flow from that.

JUDGE BOLLWERK: All right. Go ahead.

JUDGE WHITE: No, I was just going to say, just to be perfectly clear then, what you have said now and what you said previously, the difference in those two numbers -- I know you don't have error bars on these things -- are within error, and we could almost be reasonable to say that they are the same?

MR. SCHWARTZ: I would certainly go along with that, yes.

JUDGE BOLLWERK: All right. And, then, in terms of just to finish up, the world supply base,

basically, exceeds the world requirements for the reference growth forecast?

MR. SCHWARTZ: It does in the reference case. A point that I didn't make earlier, but it is probably appropriate to make, just to provide some perspective there, you know, over this 15-year period that we were looking at we ended up with a situation where we say, okay, the extent to which supply exceeds requirements is about 3.2 million SWU per year on average.

To put that in perspective, if we look back over the last four years and look at how did things balance out then, what we see is that the average was about 2.6 million SWU per year of supply in excess of requirements, about 5 percent of what total requirements were. And, actually, if we go ahead and look at what the next three years look like they will be, there is much less uncertainty in that.

That kind of margin of about 3 million SWU per year appears to be historically what the industry has had as margin, and we think that is important. You know, whether it is to offset potential problems at any particular supply, whether it is just to assure a reasonable level of competition in the market, you know, but, again, just to put that in perspective,

yes, it is positive, but that is the level; it is not excessive in our mind.

And, then, the high forecast case requirements do once again exceed supply.

JUDGE BOLLWERK: Okay. And again, I guess AREVA's point would be that, whatever the world supply base is, what we are worried about is U.S. domestic production. That is part of the major policy point that is being made by the Department of Energy?

MR. SHAKIR: That's exactly right.

And I also want to highlight one other important point because we talk a lot about the uncertainty and the demand post-Fukushima, and it is really important to keep in mind the uncertainty on the supply side as well. We have projects planned, but there are technical issues; there are financial issues that are in the way. They may or may not happen.

We see that firsthand in these contracts. When I talked about 90 percent of the output of the facility through 2028 is contracted, we have had a lot of discussions with utilities. And it was very clear from day one, when we thought about moving forward with this project, when it was just a concept, that they wanted that, they encouraged that, and they were

prepared to ink contracts with AREVA in support of this project, because what they see is uncertainty in the supply down the road.

Projects exist on paper, but whether they will make it to the field and get built and operate successfully is another story. So, that is important to keep in mind because that is one of the underlying assumptions here when we talk about supply and requirements.

JUDGE BOLLWERK: All right. Thank you.

MR. SHAKIR: Thank you.

JUDGE BOLLWERK: Let me just turn to the staff and see, given the discussion I have just had, mostly with AREVA, any other comments that you all want to make in terms of the analysis you provided or what they have had to say?

DR. BIWER: One thing I would like to mention is that we used the five-year average for the U.S. demand. We used, I think it was 2005 through 2009. And part of the reason is because of the demand does fluctuate from year to year, depending on where the reactors are in their cycles and the fuel rod facilities are with the manufacturing.

In fact, I believe in 2009 the demand was actually greater than 17 million SWU, and a couple of

years prior it was only about 13 million SWU. So, you can see that there's a swing of 2 to 4 million SWU per year, depending on the excess capacity or storage they have of product.

JUDGE BOLLWERK: All right. Let me just see if there are any other questions either of the Board members have.

JUDGE LATHROP: I don't have any.

JUDGE BOLLWERK: All right. Judge White?

JUDGE WHITE: No.

JUDGE BOLLWERK: The only other thing I would add is that I made some comments before about GE Hitachi, and, obviously, the staff has to do whatever analysis is appropriate in that case, but I will be very interested to read it when it comes out, in any event.

(Laughter.)

But that is the issue for Judge Ryerson, if he is interested in that.

So, in any event, let me, then, turn to counsel for both the staff and AREVA and just see if you have any thoughts about the question that I raised, which was actually posed last night during the limited appearances.

JUDGE LATHROP: Yes, Your Honor.

If I may, Mr. Curtiss?

MR. CURTISS: Please, go ahead.

MS. LEMONCELLI: Thank you.

Your Honor, as you indicated, pursuant to the applicable regulation in 10 CFR 5192(a)(2), the staff would consider supplementing an EIS if there are new or significant circumstances or information presented.

The staff would submit, however, that the events associated with the tragic Fukushima accident, while they are new, they are not significant with regard to the staff's analysis. As the staff indicated in its response to a Board question on this very issue, and that is in Exhibit NRC000136, to date, with regard to the staff's knowledge, no combined license applicant has withdrawn its application or sought suspension of the staff's review in light of the Fukushima events.

In addition, I will echo Mr. Shakir's comment with regard to the current operating fleet, that, again, the staff is not aware of any plans planning to decommission or shut down as a result of the Japanese events.

Thus, with regard to the staff's analysis, the Japanese events at this point have, as far as we

are aware, no impact on the staff's assumptions as discussed in its purpose and need analysis and the Final Environmental Impact Statement.

JUDGE BOLLWERK: All right. Then, does AREVA have any comments?

MR. CURTISS: Well, Your Honor, I agree with everything that counsel for the staff has said. But the test here is not just whether there is new information; there has to be a significance component of the information.

It is clear in the leading case law, Marsh v. Oregon, which is a U.S. Supreme Court case, as well as in the Hydro Resources case of the Commission, that this issue has been addressed in the manner that counsel for staff has suggested.

I would also say that, as I recall the discussion from the limited appearance session which was the basis for the argument that the EIS should be supplemented, I will address what I think are the principal points.

The reliance on an outdated 2002 letter from Bill Magwood, a point that was raised, I think has been addressed by this panel, pointing to the comments of Secretary Chu and Shane Johnson. So, I do think, as Mr. Shakir has outlined, that there are

contemporaneous statements and additional reasons for why we continue to want a domestic source of enrichment.

The staff has appropriately noted in the EIS where COLAs have been suspended, and I think that evaluation accurately reflects the facts as they have been understood. And no significant changes have resulted as a result of Fukushima, as the staff has indicated.

There was information that I think is factually incorrect that was argued as the basis for supplementation. I do not think it is correct that either South Texas or Calvert Cliffs have been cancelled. In fact, the review is underway at the NRC with respect to those projects. Any project, of course, must pass a business test, but those applications have been proceeding.

So, I think, in the main, as I reflect on the principal arguments that have been made on this issue of supplementation, and the relevant Supreme Court and Commission standards, together with the staff's analysis in the EIS and the materiality standard that must be applied here, we see no basis for the argument that, under the Commission's regulations, supplementation is required here.

JUDGE BOLLWERK: I guess there's also the point, what the Board says will amend the EIS or supplement the EIS in itself, although, again, our comments in the context of a mandatory hearing are not subject to the -- there's no intervention. There's no parties involved. There's no party comment other than what I have just heard from you all and what we heard from the parties. But, nonetheless, that is the situation.

All right. I appreciate your comments. Thank you very much.

Any other questions from any of the Board members?

JUDGE LATHROP: No.

JUDGE BOLLWERK: No. Judge White?

JUDGE WHITE: No.

JUDGE BOLLWERK: No?

All right. Gentlemen, I thank you very much for your time and your service to the Board. I think we all found it very enlightening, and we appreciate the effort you put into it. Thank you very much.

All right. The second presentation that we have is dealing with preconstruction activities, and the lead party on this one, again, is AREVA.

There are two presenters for AES and, also, two available NRC staff witnesses.

All right. And if AREVA would like to introduce their witnesses?

MR. CURTISS: Yes. We have two witnesses who will take the lead on this presentation topic No. 2. To the far right as the panel looks at the dais is George Harper, and next to him is Jim Kay.

JUDGE BOLLWERK: All right.

MR. CURTISS: Both of whom have testified previously in this proceeding.

JUDGE BOLLWERK: We heard them during the safety hearing.

So, welcome back, gentlemen. We appreciate your coming and talking with us today.

If you could raise your right hand, please? And I need a verbal answer to the question I'm going to pose to you.

WHEREUPON,

GEORGE HARPER AND JIM KAY

having been called as witnesses by Counsel for AES, were duly sworn.

JUDGE BOLLWERK: All right. Thank you.

All right, and we probably have a couple of exhibits. Let me go to the right place.

It appears that we have one, is that correct?

MR. SMITH: Correct.

JUDGE BOLLWERK: All right.

MR. SMITH: Yes, the one AES exhibit associated with this topic is AES000105. That is the AES presentation on topic two, "Preconstruction", dated July 1st, 2011.

And, then, for completeness, I would add that the statements of professional qualification for Mr. Kay were Exhibit AES000012 and for Mr. Harper were AES000011, and those were previously admitted during that safety portion of the proceeding.

JUDGE BOLLWERK: All right. Thank you.

All right, then. If we could, please, mark for identification AES Exhibit -- I'm sorry -- Exhibit AES000105, as described by counsel.

[Whereupon, the document was marked as Exhibit AES000105 for identification.]

MR. SMITH: We would like to move to admit that exhibit into evidence.

JUDGE BOLLWERK: Any objection?

MS. LEMONCELLI: No objection, Your Honor.

JUDGE BOLLWERK: There being no objection,

then Exhibit AES000105 is admitted into evidence.

[Whereupon, the document marked as Exhibit AES000105 for identification was admitted into evidence.]

JUDGE BOLLWERK: All right. And, Mr. Lemont and Mr. -- it's Biwer? --

DR. BIWER: Biwer.

JUDGE BOLLWERK: -- okay, Mr. Biwer, you were obviously previously sworn, and you remain under oath.

All right. Again, perhaps by way of a little bit of explanation, there were some questions that were raised during the safety issue, the safety hearing -- excuse me -- the safety portion of this hearing about preconstruction activities and we received some information. And in fact, there is a discussion in the Board's initial -- that would be PE-11-11 -- about preconstruction activities.

There was an exemption granted which allowed AES to go forward with some of these activities, which we're in the process -- and I think that has not yet been finalized, if I remember. There's a rule change, also, that the Agency is undergoing to conform what are now the rules on the

reactor side with what will exist on the materials side. And basically, the exemption sort of followed along with what that rule change would be.

But the Board, nonetheless, on the environmental side, and there were representations during the safety hearing that the impacts of the preconstruction would be assessed and discussed in the Environmental Impact Statement.

And we also were sort of interested in, notwithstanding the legal positions of the parties, what activities AES would undertake if, for some reason, this facility were -- they had done their preconstruction activities, but the facility was not completed.

And so, that's why we are here this afternoon, to hear what you have say about those subjects.

So, we appreciate your being here.

MR. KAY: If you would put the presentation up, please?

My presentation will address the Board's question pertaining to preconstruction activities, both those that have been completed, some that have been planned, that apply to the exemption that was granted. And the objective would be to describe the

preconstruction activities that have been undertaken, address what types of redress and restoration actions would be mandated, and address what redress and/or restoration activities we would anticipate actually taking.

Next slide.

The next two slides just summarize the exemption that was granted.

Slide 3, please.

And these are the regulations that we have applied, the exemption that it was granted for, and, also, the regulations that are also being changed in rulemaking.

Slide 4.

These are the nine activities that were granted by the exemption and those which we are considering undertaking.

The next slide, please.

We actually began preconstruction activities in the later part of 2010. We began with the mitigation of the historical resource MW004. We started that in October, early October of last year, and completed that activity just prior to beginning our preconstruction activities.

We began the preconstruction in early

November, completed it at the end of November, or just before Thanksgiving.

Within the activities that we actually have conducted, we did some road improvements to the existing farmer's road. We saw that during the tour yesterday. And we also did clearing and grubbing for the site, the main access road, and the construction power lines.

And to date, we have not conducted any preconstruction activities this year.

The next slide.

JUDGE BOLLWERK: When you say "grubbing", how is that different from clearing? Or is it the same, just a different term?

MR. KAY: Just a different term.

JUDGE BOLLWERK: All right.

MR. KAY: Those activities that we are contemplating performing later this year would be topsoil removal. We would continue the clearing activity. We would drill and shoot/blast and conduct some limited excavation, as well as continue with the subbase construction for roads and for the permanent access roadway.

JUDGE BOLLWERK: In terms of the facility as we saw yesterday -- and you mentioned we went on a

site visit yesterday. Both AREVA sponsored and took the Board and the NRC staff and, also, some representatives from the Snake River Alliance on a site visit yesterday.

Where would you be removing topsoil from, approximately?

MR. KAY: This would be from, if you remember -- and let me show you one of the figures here and I'll show you that.

JUDGE BOLLWERK: Okay.

MR. KAY: The next slide.

I put these two slides or two pictures here, basically, to show the road access points coming off of Highway 20 are the two areas that we cleared, and the farmer's road is a little difficult to see, but it is on the far right and is the white line coming up from Highway 20 to the middle of the first two crop circles. That is the road that we actually drove on yesterday that is improved with the gravel rock.

The crop circle that you see to the far western side is the crop circle that the actual plant will reside on. And that's the area that was principally cleared and grubbed.

MR. HARPER: Really, any soil removal

later this year or the rock excavation would be under the footprint of the main structures of the plant.

MR. KAY: And the actual mitigation of MW004 was on the western side of the plant where there's a footprint that shows the base for the electrical switchgear, the transformers for the power.

The next slide.

I put in a couple of pictures to just show the MW004 mitigation. All right. What we started with is on the left, and the gridwork was actually laid out in 1-meter squares. And you can see some of the actual archeological work that was done. You can see the bed frame that was discovered in the ground.

Next slide.

The picture on the left is the depth that we actually excavated. All right. It shows a little bit more of the bed frame.

And the picture on the right shows that we got down to the flooring level. We saw a little bit of the residual of the floor yesterday, but that was the condition of the floor at that time.

Next slide.

These two pictures show the road improvement on the farmer's road, the placement of gravel. And this is the road that takes you up to the

crop circles that we drove into.

So, you have one looking north from the potato sheds and then one looking south back towards the potato sheds.

Next slide.

These are several days later. These show the changing conditions. These are actually snowing. And what you look at is the road after the gravel placement in both pictures.

Next slide.

JUDGE BOLLWERK: Let me ask you just a quick question. In terms of slide No. 6 where you talk about road subbase construction for the permanent access road, how is that different than what you have done up to this point? And I assume we are talking about the same road? Or is it a different road?

MR. KAY: That will be the different, it's a different road.

JUDGE BOLLWERK: A different road?

MR. KAY: The permanent access road is to the left of the farmer's road.

JUDGE BOLLWERK: Okay. Can you go back to slide No. 7, please, really quickly?

So, that would be, on this diagram, the one that is more toward the center?

MR. KAY: Yes.

JUDGE BOLLWERK: All right.

MR. KAY: Yes. That's the permanent access road there.

JUDGE BOLLWERK: Okay. And so, you will be improving that one to sort of the same standard as the farmer's road is now or somewhat less or --

MR. KAY: No, that will probably be a paved road.

JUDGE BOLLWERK: Okay. So, eventually -- will you ever pave the farmer's road or is that going to remain a dirt road or a gravel road?

MR. KAY: We haven't decided on that.

JUDGE BOLLWERK: Okay. But you will have the one main access road and --

MR. KAY: That's correct.

JUDGE BOLLWERK: -- this is the one you're going to pave, and that's the one you're referring to here?

MR. KAY: That's correct.

JUDGE BOLLWERK: Okay. All right. I interrupted you. I'm thinking we were on slide 12.

MR. KAY: Slide 12, please.

To address the redress/restoration requirements, all right, we looked at federal, State,

and local requirements. And for the federal, there are no site redress requirements for the activities that are permitted under our exemption. That also exists for both the State and local requirements. There are no site redress requirements.

JUDGE BOLLWERK: So, that means with respect to all the activities that are listed on slide No. 4, some of which you have done, some of which you may do, some of which you may not do before, assuming there is a license granted at some point, there's no requirements for the State or the federal government or the local government of Bonnieville County that any of those things that you do you have to go back and do any redress work?

MR. KAY: That is correct.

JUDGE BOLLWERK: Okay. All right.

MR. KAY: Next slide, please.

Now these describe the actions that we would take in a site redress and restoration activity. And, principally, these actions will focus on minimizing any hazards to humans, wildlife, and minimizing adverse environmental impacts.

So, these are going to include regrading of worked and stockpiled areas, basically, to preclude erosion. We will stabilize areas, where appropriate,

for either putting soil back or vegetation plantings. And remove all equipment and temporary structures and removal of any fencing that would be pertaining to the construction activity.

JUDGE BOLLWERK: All right. Then, let me just, with respect to the work potentially you listed on slide -- hold on one second here -- slide 6, potentially, doing in the late summer or early fall, in terms of the topsoil removal, including additional clearing and grubbing, I guess drilling, and you're talking about blasting, how would those sorts of activities and the redress that you are talking about kind of match up? In other words, if you are blasting, how are you going to come back and what would you do to perform any redress?

MR. HARPER: Well, we're still working through the details right now of what, if any, of these items we will actually do this year. We are working with our Construction Manager to look and see what activities we need to do this year, if any, in order to maintain our overall schedule for the project.

JUDGE BOLLWERK: All right.

MR. HARPER: So, we don't have a definitive idea right now what, if anything, we would

do, but it goes back to the slide there, slide 13, if you could bring it up there again.

Essentially, it is really to address what those bullets there say. We would put material back in as needed to regrade any of the worked areas, not necessarily to bring it back up to current grade, but to get to a situation where we would preclude erosion, channelized runoff, and be in a position to add topsoil and stabilize it, stabilize the surface through some vegetative plantings.

JUDGE BOLLWERK: Okay.

JUDGE WHITE: So, you're saying that topsoil removal, blasting, and so forth, leveling, by addition of topsoil, addition of -- I don't know if we can really refer to it as topsoil, but the sedimentary cover over the bedrock. Would you expect that the area would be reclaimed to the extent where its prior uses for agriculture and grazing could be resumed, more or less, at the same level as before? Or would it severely impact the ability of that land to go back into production?

MR. HARPER: Yes, I envision from a grazing standpoint, it would be back to close to what it is now. But, as far as the agricultural purposes, since we don't know exactly what we're going to do, we

really can't, I couldn't make a statement of that right now, as to whether or not it would be -- whether we would need to restore it back to full agricultural purposes.

JUDGE WHITE: Okay.

JUDGE BOLLWERK: All right.

JUDGE LATHROP: Do you have a time date for when you are going to decide what you are going to do?

MR. HARPER: We will have our decisions on what, if anything, we are going to do for the rest of this year in the July/August timeframe.

JUDGE LATHROP: Thanks.

MR. HARPER: Relatively near-term, since we would have to do that work in September/October.

JUDGE BOLLWERK: And does your agreement with the landowner that's there have any impact on any of this?

MR. HARPER: AES currently owns the land. We purchased it last year.

JUDGE BOLLWERK: Okay. So, the farming that we saw yesterday was actually perhaps the current owner, the former owner coming up on the property with AES's permission to do the work?

MR. HARPER: Correct.

JUDGE BOLLWERK: Got it. All right. Thanks.

All right.

MR. KAY: And the last slide is just our conclusion. So, to date, we have only conducted some very minimal preconstruction activities under our exemption. We have determined that there are no mandatory site redress requirements. And therefore, what we have done is what we will volunteer to do in terms of regrade, stabilizing, and appropriate to minimize any hazards to humans and/or wildlife.

JUDGE BOLLWERK: All right.

MR. KAY: Thank you.

JUDGE BOLLWERK: Any questions from either of the Board members?

(No response.)

All right. Let me just ask the staff, given what you heard, do you have any comments on what they are proposing to do or in terms of either the construction relative to, the preconstruction relative to the exemption or in terms of any of the redress activities?

DR. LEMONT: Okay. Well, in terms of the preconstruction related to the exemption, the only comment I have is that the NRC approved that work, and

they can go ahead with it.

As far as the redress is concerned, Mr. Kay mentioned that there were no federal, State, or local redress requirements. And I could only comment with regard to the NRC, that I can say that the NRC does not have those requirements, but I'm not sure about, I don't know the answer to that for other federal agencies or State or local agencies. So, I really can't comment on that.

And as far as the redress activities themselves, they look like good ideas, but without seeing exactly the plans of what they would be doing, we couldn't really comment on their adequacy.

JUDGE BOLLWERK: Would there be any reason, if they ever were to go to this mode, that you would want to see those plans? I mean, is that something you are involved with?

DR. LEMONT: No. No, there wouldn't, since the NRC does not have redress requirements.

JUDGE BOLLWERK: All right.

Any questions from either of the Board members then?

JUDGE WHITE: No.

JUDGE BOLLWERK: No?

JUDGE LATHROP: No more.

JUDGE BOLLWERK: Then, gentlemen, I thank you very much for your attention to providing the Board with the information you have. Thank you very much. We appreciate it.

All right. Why don't we go ahead -- it hasn't been that long since lunch, but this next presentation make take a little bit of time. So, let's go ahead and take a brief 10-minute break, and we will come back, oh, say around 10 after, around 10 after 2:00.

Thank you.

(Whereupon, the foregoing matter went off the record at 2:03 p.m. and went back on the record at 2:18 p.m.)

JUDGE BOLLWERK: All right, we can go back on the record, please.

All right. We're here after a brief afternoon break.

And we are going to move on to presentation 3 now, which deals with the greenhouse gas impacts of the facility's production power consumption.

And the lead party for this presentation is the NRC staff. There's one witness. And AES is -- we basically have a staff witness to help us with this

presentation.

So, if you want to go ahead and introduce the witness, please?

MS. LEMONCELLI: Yes, Your Honor.

Our witness for presentation topic No. 3 is Mr. Ronald Kolpa. Mr. Kolpa is with the Argonne staff.

JUDGE BOLLWERK: All right. And if you would, sir, if I could get you to raise your right hand? And if you could give me a verbal response to the question I'm going to ask you.

WHEREUPON,

RONALD KOLPA

having been called as witnesses by Counsel for the NRC staff, was duly sworn.

JUDGE BOLLWERK: Thank you, sir.

All right. And I think we have several witnesses -- excuse me -- several exhibits for this witness or with this presentation?

MS. LEMONCELLI: That's correct, Your Honor. We have several exhibits to be marked for identification.

JUDGE BOLLWERK: All right.

MS. LEMONCELLI: May I proceed?

JUDGE BOLLWERK: Yes, please.

MS. LEMONCELLI: Thank you, Your Honor.

I'll start with NRC000190, NRC staff presentation topic No. 3, "Greenhouse Impacts and Facility's Production Power Consumption".

NRC000191, U.S. Energy Information Administration, DOE/EIA-0384, "Annual Energy Review, 2009", excerpts.

NRC000192, DOE/EIA-0384, "State Electricity Profiles, 2009", dated April 2011, excerpted.

NRC000193, U.S. Environmental Protection Agency "Inventory of U.S. Greenhouse Gas Emissions and Sinks", 1990 to 2009, Chapter 3, excerpts.

NRC000194, DOE/EIA "State Electricity Profiles, 2009", dated April 2011, excerpts.

NRC000195, U.S. Environmental Protection Agency "eGRID2010, Version 1.1, Year 2010" (sic) "GHG Annual Output Emission Rates".

And finally, NRC000196, International Energy Agency, "CO2 Emissions from Fuel Combustion Highlights (2010 Edition)", Table 1, excerpts.

JUDGE BOLLWERK: All right. Thank you.

Let the record reflect, then, that Exhibit NRC000190 through Exhibit NRC000196, as described by counsel, have been marked for identification.

MS. LEMONCELLI: That's correct, Your Honor.

[Whereupon, the documents were marked as Exhibits NRC000190 through NCR000196 for identification.]

JUDGE BOLLWERK: And then --

MS. LEMONCELLI: Your Honor, we move to have those records admitted into evidence.

JUDGE BOLLWERK: Okay. Any objection?

MR. CURTISS: No objection.

JUDGE BOLLWERK: There being no objection, then Exhibits NRC000190 through NRC000196 are admitted into evidence.

[Whereupon, the documents marked as Exhibits NRC000190 through NCR000196 for identification were admitted into evidence.]

JUDGE BOLLWERK: And at this point, I believe we are ready for Mr. Kolpa's presentation.

And again, by way of some background, I think the Board became interested in this subject based on the exchange of questions and answers we had with the staff, particularly with the staff, about the

greenhouse gas impacts of the facility, how those were calculated, and, also, some information that we had seen in various Environmental Impact Statements relating to combined licenses that made some representations about impacts relative to the uranium fuel cycle.

And so, Mr. Kolpa I think is going to tell us about those impacts.

MR. KOLPA: Thank you.

As you mentioned in your introduction, in topic 3 the Board asked three specific questions regarding greenhouse gas emissions and how those emissions would vary over a variety of scenarios for providing power, electrical power, to support EREF production.

I will provide to each of those questions, but I would like to preface those answers with some information and some background on greenhouse gases that will help to establish some important perspective, and certainly help create a fuller appreciation of those answers.

Specifically, I would like to provide some information that was published by the U.S. Department of Energy's Energy Information Administration regarding the profile of electricity-producing

technologies that are operational in Idaho, and the latest available data published by EIA regarding the greenhouse gases that result from the operation of those technologies.

I will also demonstrate the manner in which amounts of greenhouse gas emissions can be estimated based on which technology is being used to produce electricity.

And finally, I will produce data on greenhouse gas emissions at State, local, and global scales.

As a matter of background, let me just say that greenhouse gases, there are numerous sources, both natural and anthropogenic. For our purposes here, the greenhouse gases of greatest interest are those that result from the combustion of fossil fuels such as coal and natural gas.

There are three primary greenhouse gases that result from that combustion: carbon dioxide, methane, and nitrous oxide. Among the three, carbon dioxide predominates and it is often the convention in climate change research to represent the three greenhouse gases, the principal greenhouse gases, from fossil fuel combustion as carbon dioxide equivalents.

In the atmosphere, greenhouse gases are

transparent to incident solar radiation, but they act to trap radiated radiation reflecting back from the surface of the earth and, thus, preventing that heat from dissipating into space and over time causing a warming of the earth's atmosphere.

Slide 3, please.

JUDGE BOLLWERK: We are now on NRC000190, is that correct? That's your slide presentation.

MR. KOLPA: Yes.

JUDGE BOLLWERK: And I should mention as well, his curriculum vitae was part of the responses to the questions, I take it, when that was submitted?

MS. LEMONCELLI: That's correct, Your Honor. That has already been marked and entered into the record. The exhibit number is NRC000154.

JUDGE BOLLWERK: Thank you.

MS. LEMONCELLI: Thank you, Your Honor.

MR. KOLPA: The Energy Information Administration is the United States official source for energy-related information. EIA publishes numerous reports on various primary energy sources used in the United States to produce electricity and the various technologies used to produce that electricity. In the case of electricity production and consumption, EIA produces its reports from various

reports submitted to EIA by generators.

Unless otherwise specified, the electricity data in this presentation were obtained from EIA reports.

What you see in this graph is the distribution of energy technologies, electricity-producing technologies, that were used to produce electricity in the United States in the year 2009. In 2009, the United States produced 3,741 billion kilowatt hours of electricity. And what you see displayed here, again, are the distributions and the percentages, the relative contributions of each of the technologies.

Let me point out two pieces of data that will become important as we move through this presentation. Coal, on a national level, is responsible for roughly 45 percent of the electricity produced in the United States, and hydroelectric, in the lower righthand portion of the pie chart, is responsible on a national level for 7 percent.

Slide 4, please.

What I have shown in this table is the Idaho electricity data, again, for the year 2009. There are three principal categories of generators who produce electricity to be placed onto the high-voltage

transmission grid in Iowa. There are electric utilities, there are independent power producers, and combined heat and power plants.

Electric utilities is, as you would expect, those who are in the business of producing and selling electricity.

Independent power producers also sell electricity, but they do not have long-term agreements. They sell their power to the grid operator in the spot market.

And finally, combine heat and power plants produce steam, some of which they use for their internal processes, some of which they use to produce electricity. Some of that electricity is placed onto the grid. Some of it is consumed internally at the facility.

So, you see the distribution there, that the majority of the electricity that is put on the high-voltage grid in Idaho, over 76 percent, is produced by the electric utilities, and those other categories of generators are responsible for the rest. And you can see the distribution of technologies being used by those utilities and by those independent power producers and combined heat and power producers.

JUDGE LATHROP: Just for the record,

there's a typo in that viewgraph. The sum of the independent producers should be 23.8 percent instead of 3.8 percent.

MR. KOLPA: Oh, I'm sorry. Yes. Thank you.

Let me point out a few important points here on this table. First, the State total, 13,100,152 megawatt hours of electricity in 2009 by Idaho generators. Compare that over the same timeframe with 3,741,000,000 megawatt hours produced in the United States.

You can see that there are fossil fuels being used for electricity production in Idaho. Coal has the largest emission factor of greenhouse gases with respect to megawatt hours of power delivered. Natural gas has a greenhouse gas footprint, an emission factor that is roughly one-third of the coal output per megawatt hour of electricity produced.

Importantly, remember from the previous slide that goal was responsible for 45 percent of the power in the United States, and here it is responsible for a very negligible amount in Idaho. Likewise, natural gas, 23 percent of the nation's electricity is produced by natural gas; whereas, in Idaho that contribution is only 12.5 percent. And finally,

hydroelectric, remember from the previous slide, 7 percent of the nation's electricity is produced by hydroelectric facilities; whereas, in Idaho it is almost 80 percent. That fact alone --

JUDGE WHITE: Can I ask a quick question?

MR. KOLPA: Yes.

JUDGE WHITE: I'm sorry to interrupt.

Just for clarification, these data refer to electricity generated within the State of Idaho? Or are they related to the sources of electricity that is used in the State of Idaho?

MR. KOLPA: No, these are generated by generators that are located in Idaho.

JUDGE WHITE: Okay. And would it be fair to say that electricity used in this part of Idaho is dominantly generated within the State of Idaho?

MR. KOLPA: Well, a later slide, I will talk about the power pools that --

JUDGE WHITE: That's fine.

MR. KOLPA: -- that exist.

JUDGE WHITE: Yes.

MR. KOLPA: It is correct to say that in most instances the transmission will attempt to supply power to satisfy a load from the closest possible baseload source to reduce transmission losses.

JUDGE WHITE: Right.

MR. KOLPA: So, as close as these sources are to this part of the State, they would be the most likely sources used to satisfy the loads in this part of the State.

JUDGE WHITE: Okay. I was just trying to clarify -- you're giving us a lot of data statewide -- I was just trying to clarify the relevance of this to the power consumption in the region in which the EREF would be located.

MR. KOLPA: Right.

And again, I'll point out, the difference between the State total and the United States total, 13,000 megawatt hours for the State; 3.7 billion megawatt hours for the United States all together. Idaho's contribution represents 0.35 percent of the national generation.

Slide 5, please.

Let me give you a little more national perspective with regard to greenhouse gas emissions that relate to energy production. As you can see there, 98 percent of the nation's CO2 is produced as a result of energy-related activities. And energy-related activities means power production as well as consumption of fossil fuels, distillate fuels in the

transportation sector, and use of distillate fuels and use of natural gas for heating purposes.

Forty-nine percent of the nation's methane is from energy-related activities, and 13 percent of the nation's nitrous oxide, again, from energy-related activities.

And in the United States in 2009, the total CO2 equivalent emissions from energy-related activities was 5,377.3 million metric tons. And that breaks down, as you see there, most of it from fossil fuel combustion and most of that from electricity production.

Slide 6, please.

Now let me drill down and focus on a State perspective with regard to greenhouse gas emissions from electricity production. In Idaho, as I had mentioned previously, electricity generated by Idaho generators represents only 0.35 percent of the nation's total, and 1,024,000 metric tons of related greenhouse gas represented only 0.05 percent of the national electricity-related greenhouse gas emissions.

The reason for that disparity is the predominant use of hydroelectric, which is essentially a greenhouse-gas-free technology for producing electricity.

And to emphasize that, you need to look only at the numbers. Idaho's three largest sources were hydroelectric, natural gas, and other renewables. And again, hydroelectric at the national level, 7 percent; Idaho's contribution from hydroelectric, 79.6 percent, a very strong influence in the amount of greenhouse gas per megawatt hours of electricity produced in Idaho. And there, again, are the comparisons to the United States total and the United States contributions.

In fact, Idaho's electricity-related CO2 emission factor is the lowest among the 50 states. And by emission factor, I mean pounds of CO2 equivalent per megawatt hour of power delivered.

Slide 7, please.

This is a representation of the areas across which the Environmental Protection Agency aggregates data that it receives from generators with regard to electricity generation and with regard to related emissions.

The United States Environmental Protection Agency is the U.S. representative to the Intergovernmental Panel on Climate Change. And as such, it is responsible for collecting and maintaining data necessary to calculate greenhouse gas emissions,

and it reports annually on the nation's inventory of greenhouse gas sources and sinks. All of the raw data used by EPA in developing those annual inventory reports is available electronically from EPA's eGRID website, eGRID, an acronym standing for Emissions and Generation Resource Integrated Database.

The area I want you to focus on is in the upper northwest part of the contiguous continental United States, the Northwest Power Pool. That is roughly the area within which all the generators are located that are likely, are mostly likely to supply power to EREF. Again, the point being that the transmission operator attempts to shorten the distance between generation source and load to minimize transmission losses. That's not to say that there isn't substantial amounts of power transferring between these regions, but, as a first order, as a first priority, the load would be satisfied by generation sources within those power pool regions. Throughout the rest of this calculation, I am assuming that would be the case.

Slide 8, please.

With that as background, we are almost ready to begin calculating the greenhouse gas emissions. A few more items that need to be

established:

First of all, in the Environmental Report AREVA estimated the EREF power demand at 78 megawatts. I used that number to calculate the next number, which is to be considered a bounding condition for the annual power consumption that AREVA would consume operating at full production 24 hours a day, seven days a week, 365 days a year, definitely a bounding condition, 683,260 megawatt hours, or I'm sorry, 280 megawatt hours of power.

That Northwest Power Pool that you saw on the last slide is made up of a collection of technologies, including a substantial amount of hydroelectric facilities, such that it's average CO2 emission, CO2 equivalent emission, per megawatt hour produced and delivered is 858.8 pounds.

Idaho's emission factor, again, with that nearly 80 percent contribution from hydroelectric, Idaho's emission factor is substantially less. It's only 172 pounds of CO2 per megawatt hour.

And finally, compare that to the U.S. average the CO2 emission factor, 1,293 pounds of CO2 equivalence per megawatt hour. Again, remember, the nation's electricity is dependent on coal to a degree of about 45 percent; natural gas, another 20-some

percent, two fossil fuels that both have greenhouse gas footprints.

In response to the Board's earlier Question No. 22, the staff provided the calculation that resulted in the second number that you see there, 683,280 megawatt hours.

Coal, as I had mentioned earlier, has the greatest greenhouse gas footprint per megawatt hour of power delivered. And in fact, because of its general thermal inefficiencies as well as because of the need to satisfy the internal loads that invariably attach to the operation of a coal plant, not just operation of the plant, but operation of pollution control devices, coal has an even greater effective greenhouse gas footprint since the power that it generates is substantially greater than the power that is actually finally delivered to the customer.

To begin to answer the Board's specific question of what the greenhouse gas footprint would be if Idaho generators provided the power to EREF to support full production in a manner proportional to the way in which they provide power to the grid, to begin estimating that, I needed to go back to the Idaho EIA report and identify those percentages and begin calculating what each of those percentages would

result in with regard to megawatt hours delivered.

Slide 9, please.

The result of those calculations: coal, again, a percent contribution for electricity in Idaho of 0.6 percent. Against that 683,280 megawatt hours of power that EREF would require, coal would be delivering 4,100 megawatt hours.

Moving on down, natural gas, contributing 12.5 percent of that 683,280 megawatt hour total, would actually deliver 85,410 megawatt hours. Hydroelectric, again, the largest contributor to Idaho electricity, 79.6 percent. Seventy-nine point 6 percent of 683,280 megawatt hours is 543,890 megawatt hours, and on down the line.

Other renewables. In other are categories defined by EIA for purposes of data presentation. Let me tell you what those two categories include.

Yes. Sorry. I have misplaced my notes there.

Let me just say from memory, other renewables involve wind, solar, biomass, co-firing of wood products with coal, and a variety of other things that, in general, have very limited contributions as individual technologies, but there you see as an aggregate represent 6.6 percent.

Not all of the technologies in the other renewables category actually release greenhouse gases. Some of them that you might expect would release greenhouse gases are not considered as such. For example, biomass wood products that are burned for electricity are considered by EPA to be greenhouse-gas-neutral since during their growing phase they act as sinks. And the presumption is they absorb as much CO2 from the atmosphere as they are growing as they release when they are combusted.

And, then, the other category, again, a collection of a variety of technologies, none of which makes a substantial contribution, only a few of which have a greenhouse gas footprint. But I assumed, on a conservative basis, that all of them would have a greenhouse gas footprint. And so, in the next column to the right, you can see I have applied the emission factor for Idaho generators, 858.8 pounds of CO2 equivalent per megawatt hour.

The final column on the right, then, is the result of that calculation. CO2 emissions in metric tons from each of those contributions, from each of those contributing technologies. When you total that, you end up with 54,145 metric tons of CO2 equivalent that would have been released had Iowa

(sic) generators provided all the power to EREF in a manner proportional to the way in which they provide power to the Idaho transmission grid.

JUDGE LATHROP: But this calculation then assumes that all of the power to be used by EREF comes from within the State of Idaho, not from the neighbors in the Northwest Power Pool, Wyoming and Montana, which are close hereby, is that correct?

MR. KOLPA: Yes, it does. But it was done in that manner to explicitly address one of the Board's questions.

JUDGE LATHROP: Well, the question, whether it was phrased exactly this way, was meant to be the greenhouse gas emissions corresponding to the actual use to be expected by EREF. So, where this power comes from is not the same necessarily as the State of Idaho.

So, do you have any feel for where the power comes from here?

MR. KOLPA: Well, as I mentioned earlier, it is the first priority of any transmission operator to provide power to load from the closest source. And it is more likely the case that in the majority of times the power demands of all of the loads within the Northwest Power Pool would be provided by generators

within the Northwest Power Pool.

JUDGE WHITE: And if that were the case, then one thing we could look at, and perhaps you do, would be the CO2 equivalent per megawatt hour that you showed us for the power pool.

MR. KOLPA: Right.

JUDGE WHITE: Which, in fact, is about five times higher --

MR. KOLPA: Right.

JUDGE WHITE: -- than that of Idaho.

MR. KOLPA: Right. I did not specifically run that calculation, again, thinking that the Board was interested in knowing just exactly what the results would be if it were Idaho generators providing all of the power in a proportion to the way in which they provide power to the grid.

But if you wanted to produce that calculation, it does not change too much with regard to the CO2 emission factor since that is the Northwest Power Pool's emission factor, but it does change with regard to proportion.

JUDGE LATHROP: If we use the Northwest Power Pool factor, it would just be, as Judge White said, five times this number, the 54,000 metric tons?

MR. KOLPA: No. What I said was that the

CO2 emission factor that I used in this calculation was the one that was averaged for the Northwest Power Pool.

JUDGE LATHROP: So, you did use the Northwest Power Pool factor?

MR. KOLPA: Yes, I did, but I used the proportions of contributions to the transmission grid from the Idaho generators.

JUDGE LATHROP: Ah, okay. So, this is --

MR. KOLPA: So, it would be larger, but I cannot tell you how much larger since I did not look at the Northwest Power Pool array of generators.

JUDGE LATHROP: Or proportions. All right. So, we've got apples and oranges in a way, in a manner of speaking. You have used the larger emissions factor for the Northwest Power Pool, but the Idaho proportions of generation.

MR. KOLPA: Yes.

JUDGE BOLLWERK: So, what we don't know are the proportions for the Northwest Power Pool in terms of --

JUDGE LATHROP: We may know those, but they were not used in the calculation.

JUDGE BOLLWERK: In the calculation. Okay.

JUDGE LATHROP: That's correct.

JUDGE BOLLWERK: And I think the way the question was phrased, what we are really looking at is whether the way they get their power from what the folks in Idaho Falls do or it is where the -- do they get some of it from Wyoming, some of it from Montana, some of it from here? You know, that was sort of our question, I guess.

JUDGE LATHROP: Yes, that's what we wanted to know. How much, of the actual power that will be delivered to this comes from wherever it comes from, how much it results in greenhouse gas emissions?

MR. KOLPA: Well, neither AREVA nor any other customer could specifically dictate where its power is going to come from at any given time.

JUDGE LATHROP: No, but --

MR. KOLPA: The transmission operator makes that decision in terms of sources.

I understand what you were asking. It's not how I understood your question, however.

Slide 10, please.

JUDGE BOLLWERK: Let me ask a question. Is it that no one knows that information or that we just didn't get that information here? I guess that's my --

JUDGE LATHROP: Yes, that's a good way to put it.

JUDGE BOLLWERK: In other words --

JUDGE LATHROP: If you went out and asked the local power suppliers where their electricity came from most of the time, would you have a good feel for what was being used here? Or enough to estimate this kind of a calculation?

What's driving my question is that the greenhouse gas emissions for all of the supplies that are to be delivered for the operation of EREF come from all over the United States, and there is a very elaborate calculation in the FEIS about how much greenhouse gas is emitted from all of this transportation, from the East Coast, from the West Coast, and so on. And that was part of the FEIS.

But the calculation for the similar delivery, analogous delivery, of electricity to the EREF was not done. And that is what we are trying to get a handle on, to see whether it is important or not.

I mean I want to congratulate AES for deciding to locate in a state with the lowest possible greenhouse gas emissions. That's not what we're interested in. I think my interest is why this

calculation wasn't in the FEIS to begin with. And so, that's why we're pressing you.

MR. KOLPA: I understand.

JUDGE BOLLWERK: I guess your point being that, if all the power, for whatever reason, here comes from Wyoming, and Wyoming uses a huge amount of coal, then that would be the --

JUDGE LATHROP: And Wyoming is notorious for that sort of thing. And Wyoming is quite close here. I don't know where the transmission lines have to -- they have to cross the Tetons perhaps. So, we just don't know right now.

Can you bound, in your discussion today, can you bound what it might be?

MR. KOLPA: Well, I can tell you that, if you used the Northwest Power Pool --

JUDGE LATHROP: Percentages?

MR. KOLPA: -- emission factor, you could, in fact, go back to EIA data and apply, instead of the Idaho percentage contributions, the Northwest Power Pool percentage contributions and come up with a number. It would certainly be larger than 54,000, but it certainly would be, no doubt, smaller than the national average.

And that would be, again, primarily

because those hydroelectric facilities are still in the Northwest Power Pool. And so, at any given time, they would be making contributions to the grid.

And again, the grid, the dispatch queue changes hourly. It changes, actually, on a 10-minute interval for most grids, and the transmission operator monitors load and monitors the sources of power and moves power accordingly to stay within the delivery parameters of the individual transmission segments and to minimize transmission losses.

So, you could come up with a number, but there is no guarantee that that number would sustain over any long period of time. It could change many times through the course of a day.

JUDGE LATHROP: That number would surely bound?

MR. KOLPA: Yes.

JUDGE LATHROP: Yes. If you took the power pool, the greater power pool percentages of generation and did that calculation, could you estimate that from what your personal knowledge is?

MR. KOLPA: I would prefer not to.

(Laughter.)

JUDGE LATHROP: Right. All right.

JUDGE WHITE: It would be correct, then,

to say, certainly, you would give us values if electricity were entirely generated by coal technology?

MR. KOLPA: Yes.

JUDGE WHITE: That value is in your presentation.

MR. KOLPA: Yes.

JUDGE WHITE: And you give us the value for Idaho, which we could certainly assume is the lowest value.

MR. KOLPA: That's correct.

JUDGE WHITE: And so, if we're looking for bounds, we --

MR. KOLPA: Somewhere in between.

JUDGE WHITE: -- have a very good probability that it lies between those two extremes, don't we?

MR. KOLPA: That's correct.

JUDGE WHITE: Yes.

JUDGE LATHROP: And that number you can give us? You do give us?

MR. KOLPA: Yes, I do give you both the maximum condition for coal and the minimum. The Idaho generators represent an --

JUDGE LATHROP: Okay.

MR. KOLPA: -- arrangement of generators that is about as low as you could expect to find with regard to greenhouse gas per megawatt hour.

JUDGE WHITE: And it is about five times?

MR. KOLPA: Approximately.

JUDGE BOLLWERK: Okay, good.

Are we back to slide 10?

MR. KOLPA: So, slide 10, yes.

JUDGE WHITE: That will answer the question for our purposes.

MR. KOLPA: What I have presented here are, again, to provide some sense of scale, again, that's 683,280 megawatt hours of EREF annual power demand.

Global CO2 emissions, all fossil fuels for all purposes, so this is, again, not exactly the same barrel of apples as the rest of them. There's a few oranges in there. But the global CO2 emissions, 29,381 million metric tons, 29.4 billion (sic) metric tons.

Annual U.S. electricity-generated greenhouse gas footprint, 2,154 million metric tons. Annual Idaho electricity-generated greenhouse gas footprint, 1,024,000 metric tons. The annual EREF greenhouse gas footprint, if, again, all the power was

provided by coal-fired plants, 26,749 metric tons, coal-fired plants, again, operating with a greenhouse gas emission factor, as was established in the Northwest Power Pool. And, then, the annual EREF greenhouse gas footprint if Idaho generators alone, in proportion to the way in which they support the grid, 54,145 metric tons.

JUDGE BOLLWERK: So, those last two numbers you have given us are sort of the bounding numbers that we talked about a second ago?

MR. KOLPA: Yes.

So, just to emphasize the scale that is being shown here, 54,145 metric tons of greenhouse gas is certainly not an insignificant number, but it represents only 5.3 percent of the 2009 statewide greenhouse gas emission totals that are related to energy production, 54,145 metric tons versus 1,024,000 metric tons, and only 0.0025 percent of the 2009 national greenhouse gas emissions related to electricity.

Slide 11, please.

So, in topic three, Question A, the Board asked -- the annual greenhouse gas emissions of 266,749 metric tons would result from satisfaction of EREF power demands exclusively with coal-fired power

plants, but EREF power would be responsible for only .00091 percent of annual global emissions. And from that perspective, that impact would certainly be small.

Continuing on to slide 12, satisfying EREF's annual power demands with proportional contributions, again, provides that 54,145 metric tons of greenhouse gas. That represents 5.3 percent of the statewide electricity-related greenhouse gas emissions, 0.0025 percent of the national greenhouse gas emissions. And again, from that perspective, small. And finally, 0.00018 percent of the global greenhouse gas emissions in 2009, again, a small number by comparison.

Slide 13, please.

If you took the amount of greenhouse gases that would be released from the use of Idaho generators to supply electric power to EREF and added that to the result of the calculation that you saw in the final Environmental Impact Statement, which represented the greenhouse gas emissions that directly related to EREF operations, including commuting of the workforce and, as you mentioned, sir, the transportation of feedstocks and final product and waste materials to and from EREF, the total that you

get is 80,281 metric tons. And again, from a percentage basis, that's 0.0037 percent of the annual national greenhouse gas emissions and approximately .00027 percent of the annual global greenhouse gas emissions.

And thus, regardless of the scale at which you make that evaluation, the staff believes that the electricity-related greenhouse gas footprints, and as well the footprints of that plus the greenhouse gases from direct operations of EREF, represent a small contribution to greenhouse gas emissions, both at the State and the national level, and certainly at the global level.

JUDGE BOLLWERK: I don't know if you know the answer to this question, but when the staff does assessments like this, do they actually look at the global? Do they look at the State? Do they look at the national, when they say something is small? I mean, obviously, if you look at the global, it is generally going to be pretty small relative to everything on the globe. National, again, somewhat larger, but still compared to a national average. And, then, obviously, when you get into the locality, the larger percentage is going to be. So, how does the staff assess that figure? Do you know?

MR. KOLPA: Well, the staff calculates the greenhouse gases for which they have the greatest confidence, and those would be the ones directly related to the direct, to the emissions associated directly with the operation of the facility. And for EREF, that would be commuting of the workforce and the movement of goods and materials to and from, and product and waste to and from the facility. Those are all the activities over which AREVA has some control.

JUDGE BOLLWERK: Correct. But, then, when you take that number and compare it, depending on what you compare it to, it can be larger or smaller. If you compare it on a global basis, it is going to be relatively small, given that you are looking at the entire globe. If you are looking at locally, it is going to be relatively larger because, then, you are using a smaller number upon which you are comparing it to.

So, what's the staff's general analysis? Do they go larger or smaller or somewhere in between? You have given us all these numbers. I am just wondering what the one they usually use is.

MR. KOLPA: Well, the staff would attempt to make the greenhouse gas calculation consistent with the way in which it produced calculations for the

impacts of other resources. So, if those impacts were identified at a state level, then the greenhouse gas impacts would be identified at that level, and likewise, if it were national.

Every resource is evaluated at a different scale based on the unique elements of that resource. Greenhouse gas, to the extent that it contributes to global warming, obviously, would be evaluated at a global level if you were intending to do that. There is no particular direction to the staff to do that, however.

JUDGE BOLLWERK: All right.

JUDGE WHITE: Just to clarify one last time, even if taking into consideration our previous discussion about possible sources of electricity technology, other than the Idaho average, even if the greenhouse gas emissions accounted to, say, three times the other estimate, 15 percent of the State, that sounds like a lot. But worth considering, I think, as you pointed out, that this would actually be a very small percentage of most other states.

MR. KOLPA: Correct.

JUDGE WHITE: The reason it seems fairly large is that Idaho emissions are so low compared to virtually all other states. Is that a correct

assessment?

MR. KOLPA: Yes. What benefits Idaho to be very far down on the list in terms of state greenhouse gas footprints is the same thing that brings attention to it when you are looking at that State level only.

JUDGE WHITE: Okay. Thank you.

JUDGE LATHROP: Is the definition of direct contributions that over which the applicant has control?

MR. KOLPA: That's the definition we used, yes.

JUDGE LATHROP: Is that standard for all such applications?

MR. KOLPA: I'm not sure I understand what you mean by "all such applications".

JUDGE LATHROP: Well, whenever greenhouse gas emissions are calculate for an application, is the direct that which the applicant has control, over which?

MR. KOLPA: Greenhouse gas emissions are often represented as direct emissions, directly related to the activities of the facility.

JUDGE LATHROP: That was the representation.

MR. KOLPA: Yes.

JUDGE LATHROP: But when we looked at the FEIS, the smaller number, the 26,000 or so from direct, we wanted to know, to what do we compare that? And electricity was not included. It was omitted. And presumably, because it isn't direct. But I'm now searching for, what is the definition of direct? And you provided one, but whether that is the official, standardized use by the staff, that's the question I would like the answer to.

DR. LEMONT: I would like to give you an answer.

MS. LEMONCELLI: Your Honor, if I may?

JUDGE BOLLWERK: Sure.

MS. LEMONCELLI: Dr. Lemont has some additional information for the Board to consider.

JUDGE BOLLWERK: Okay. I have no problem with that.

MS. LEMONCELLI: It might help to answer Dr. Lathrop's question.

JUDGE BOLLWERK: Okay.

DR. LEMONT: Your Honors, you're asking what is the standard for this type of analysis. And I would say that there is no standard. I mean this is something that's fairly new in these types of

analyses. It is very new in NRC analyses. I mean we just haven't really done much of this before. The NRC has no standardized guidance for this. And right now, there is no accepted final standard guidance that I know of.

So, we sort of have to determine for ourselves what makes sense in a particular situation. And the determination we made for the EIS was that we would look at the direct impacts which were related to what AES could actually control.

And in terms of trying to determine how much is coming, you know, from electricity from different areas, I mean you could probably calculate that 100 different ways and get 100 different answers. That's the way I look at it.

JUDGE BOLLWERK: Well, I hope you're not saying that you don't include electricity because it's too hard to calculate.

DR. LEMONT: No, I'm not saying that. You know, I think what we saw here today is we saw what the bounding conditions are. So, we know what the worst-case scenario might be, and as compared to national levels or global levels, you know, that's still small.

As you were saying earlier, what do you

compare it to? And one of the things, in developing this presentation, one of the things we talked about is that there's no wall around the EREF; there's no wall around Idaho Falls; there's no wall around the State or the country.

So, you know, in a sense, you really have to look at these emissions more on a global level. Now, in the EIS, we actually looked at it more on the national level. But, you know, it even makes more sense to look at it on the global level.

JUDGE BOLLWERK: Okay.

MS. LEMONCELLI: Your Honor, may I --

JUDGE BOLLWERK: Surely.

MS. LEMONCELLI: May I add a comment to that?

JUDGE BOLLWERK: Uh-hum.

MS. LEMONCELLI: Dr. Lemont is certainly correct that, in terms of the direct impacts focused on in the Final Environmental Impact Statement, the staff really looked at greenhouse gas emissions in comparison to the national level, which I think is appropriate. But we gave both the national and global level for purposes of this presentation to sort of give national and global scale.

But I think -- and Dr. Lemont will correct

me if I'm in error -- but I think that what the staff would highlight is the notion that, regardless if we are looking at direct/indirect, direct and indirect combined, whether or not it's national and global, that the impact would still remain a small impact.

Dr. Lemont, do you have anything to add to that?

DR. LEMONT: No, I agree with what you just said.

MS. LEMONCELLI: Thank you.

JUDGE BOLLWERK: And again, I think our concern, again, was -- and maybe this goes to coordination with the staff itself -- is it seems staff is saying one thing on the reactor side, which is look over here, and when you look over here, you don't see the number that you're looking for. And that sort of concerns us.

I mean we can argue about direct versus indirect. Obviously, this pen to produce it or this pencil creates some greenhouse gas, but the fact that AREVA or anybody else is going to have a box of pencils in the desks in their office, you're not going to go and create the greenhouse gas or look for the greenhouse gases in these.

On the other hand, when you are talking

about electricity, this is not a trivial number. And to qualify it as, well, it's just indirect because electricity gets produced and somebody is going to use it, that sort of bothered us, I have to admit.

So, I understand what you're saying about lack of guidance and maybe this is something the staff needs to, not only on the materials side, but on the reactor side, begin to look at this and come to a -- because the Commission has directed the Agency to look at greenhouse gases, and it is important that we do it in a consistent way.

DR. LEMONT: And we are doing that. And we're trying to get together with the other offices who are doing, as you say, who are doing it their way, and we do it our way.

JUDGE BOLLWERK: Right, right.

DR. LEMONT: And we're trying to reach a consistent approach, not only on how we look at greenhouse gas emissions, but also how we deal with NEPA in general.

JUDGE BOLLWERK: Right, and I think from the Board's perspective, we can argue about whether they should or shouldn't have been considered, but we felt, given our responsibility in the mandatory hearing, if we came up with a number, we can look at

it, make a determination, and, then, we can put it in there. And if you don't like it, you can take it to the Commission and say, "They shouldn't have done this." Or you can say, you know, "Okay, that's fine. The Board does what it does, and the number is there, and we don't have to endorse it, but it's part of the record." So, however we decide to handle it.

But, again, I think it is clear that we thought having this number in there was important in some way to have a bounding number. And I think you have given us at least your best effort to do that.

DR. LEMONT: I would like to just add one more thing, though. In our scoping process, we ask the public and agencies what we should look at in our EIS, what are the important issues. And the EPA, Region 10, who reviews our EIS, specifically asked us to look at greenhouse gas emissions, which we did. And interestingly enough, they thought that what we did, they commended us on what we did and they thought we did a good job.

So, even within EPA, I think, you know, even if you look at what EPA does, I don't think they see a convention right now in terms of how greenhouse gas emissions should be evaluated. So, they thought what we did was good. But, again, it is different

from what we are doing perhaps with regard to other agencies or even with regard to other offices within the Agency.

But what it ultimately comes down to is that, even if we include the worst-case scenario, in response to your question, we still have a small impact.

JUDGE BOLLWERK: Right, in the staff's view; that's fine. And I appreciate the input that you have given us.

JUDGE LATHROP: Yes, I think this was a healthy discussion for the future benefit of the staff. I don't think the conclusion has been affected.

DR. LEMONT: No, and I think you have brought up something that we are already thinking about quite a bit.

JUDGE BOLLWERK: Okay. Let me see if there's any other Board questions.

JUDGE WHITE: I don't have any.

JUDGE LATHROP: No.

JUDGE BOLLWERK: Anything else from the witnesses?

DR. LEMONT: That's all I have.

JUDGE BOLLWERK: All right. Then, we

thank you very much for your time and your presentation to the Board. Thank you. We appreciate it.

All right. Why don't we take about a 10-minute break here, and, then, we will move onto the next issue, which is, I believe, air quality impacts?

(Whereupon, the foregoing matter went off the record at 3:15 p.m. and went back on the record at 3:30 p.m.)

JUDGE BOLLWERK: All right, can we go back on the record, please?

All right, we have had a brief break after hearing from the NRC staff regarding the greenhouse gas impacts of the Eagle Rock Facility's production.

And we are going to move on now to presentation No. 4, which is preconstruction and construction air quality impacts. And again, the lead party is the NRC staff.

And would you like to present the witness?

MS. BOOTE: Yes. Your Honor, our presenter for presentation four is, again, Ronald Kolpa.

JUDGE BOLLWERK: All right. Glad to have you back again, sir.

MR. KOLPA: Thank you.

JUDGE BOLLWERK: By the time we get done with you today, you may want a good, stiff drink tonight; I don't know.

(Laughter.)

I should say I think the Board feels that that was a very useful debate or discussion that we had. And you may not have agreed with us, and we may not have agreed with you, but, in any event, we had the discussion and I think that was a useful thing.

And AREVA is sitting over there kind of scratching their head and saying, "Why are we getting in the middle of this internal NRC debate?"

So, let's see, you've already been sworn, sir, and you remain under oath.

MR. KOLPA: Understood.

JUDGE BOLLWERK: And let's go ahead and deal with the exhibits.

MS. BOOTE: All right.

I'll start with NRC000197, NRC staff presentation topic 4, "Construction Air Quality Impacts".

NRC000198, U.S. Environmental Protection Agency, "AERMOD Description of Model Formulation", dated September 2004.

NRC000199, U.S. Environmental Protection

Agency, "Gasoline and Diesel Industrial Engines" from AP-42, "Compilation of Air Pollutant Emission Factors", Chapter 3.3, dated October 1996.

NRC000200, U.S. Environmental Protection Agency, "Organic Liquid Storage Tanks", also from AP-42, dated November 2006.

NRC000201, U.S. Environmental Protection Agency, "Unpaved Roads", also from AP-42, dated November 2006.

NRC000202, U.S. Environmental Protection Agency, "Heavy Construction Operations", from AP-42, dated January 1995.

NRC000203, U.S. Environmental Protection Agency, "Aggregate Handling and Storage Piles", from AP-42, dated November 2006.

NRC000204, U.S. Environmental Protection Agency, EPA420-R-03-010, "User's Guide to MOBILE6.1 and MOBILE6.2 Mobile Source Emission Factor Model", dated August 2003.

NRC000205, U.S. Environmental Protection Agency, EPA420-F-05-001, "Emission Facts: Averag3e Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel", dated February 2005.

And NRC000206, U.S. Environmental Protection Agency, "TANKS Emissions Estimation

Software, Version 4.09D", released on October 5th, 2006.

JUDGE BOLLWERK: All right. Then, the record should reflect that Exhibits NRC000197 through NRC000206, as described by counsel, are marked for identification.

[Whereupon, the documents were marked as Exhibits NRC000197 through NCR000206 for identification.]

MS. BOOTE: The staff moves to have these exhibits entered into the record.

JUDGE BOLLWERK: Any objections?

MR. CURTISS: We have no objection.

JUDGE BOLLWERK: All right. Then, there being no objections, the record should reflect that Exhibits NRC000197 through NRC000206 are admitted into evidence.

[Whereupon, the documents marked as Exhibits NRC000197 through NCR000206 for identification were admitted into evidence.]

JUDGE BOLLWERK: And at this point, then, I think we are ready for the presentation.

MS. LEMONCELLI: Your Honor, before Mr. Kolpa begins, may I have your permission to approach the witness and speak with him very briefly?

JUDGE BOLLWERK: Surely.

MS. LEMONCELLI: Thank you, Your Honor.

JUDGE BOLLWERK: Why don't we go off the record for one second?

(Whereupon, the foregoing matter went off the record at 3:34 p.m. and went back on the record at 3:35 p.m.)

JUDGE BOLLWERK: Okay. Let's go back on the record then.

All right. I think we're ready for the presentation.

MR. KOLPA: Thank you.

In topic No. 4, the Board asked the staff to revisit the methodologies that it used in the Final Environmental Impact Statement to evaluate the air impacts from preconstruction and construction activities at EREF, and specifically, to address the adequacy and the capabilities of the model that was selected for that dispersion modeling, the determination of the surface data, the meteorological data, the terrain data, and other modeling assumptions that were used in that modeling, and to comment and

review the results that were obtained.

I'm the technical reviewer for and author of the EIS section on air quality impacts, and I will be making this presentation.

In responding to the Board's topic four, my presentation will provide a general overview of the structure and functionality of the air dispersion model that was used to estimate impacts to ambient air quality from construction activities of the EREF.

The presentation would also address the applicability of the selected model, the types and sources of input data that the model used in calculating construction air quality impacts, and the professional judgment and assumptions related to the identification and introduction of other factors that influence the behavior of a dispersing plume.

Finally, I'll provide an overview and interpretation of the results of the model's application.

Slide 3, please.

The model that was used is the AERMOD model. AERMOD is an acronym that reflects the collaboration between the American Meteorological Society and the U.S. Environmental Protection Agency in the development of the model.

It was first developed in 1991 and has undergone continuous improvements since then. It was designed with enough flexibility and computational power to be applicable to a wide variety of circumstances. And since 1984, AERMOD is EPA's preferred or recommended model for a wide range of regulatory applications and for use by states in the development of state implementation plans to improve or maintain ambient air quality.

AERMOD is highly refined. It is a steady-state plume model that predicts air dispersion based on precisely-defined parameters in the planetary boundary layer. The planetary boundary layer is that layer of the atmosphere immediately adjacent to the ground surface.

Specifically, those definitions of the planetary boundary layer include the turbulence conditions and the surface characteristics that exist in that boundary layer. Turbulence in the planetary layer is categorized into six stability classes describing different degrees of vertical mixing of the atmosphere. The greatest instability or the greatest turbulence is Stability Class A; the least vertical movement, most stable condition, Stability Class F.

AERMOD can be used to model dispersion

from both surface and elevated sources, including multiple points, area, and volume sources. Based on the pre-processing programs that are selected, AERMOD can be applied to both simple and complex terrain and to rural or urban areas.

AERMOD uses hourly, sequential, pre-processed meteorological data to estimate not only airborne concentrations, but also dry and wet deposition rates for both particulate and gaseous non-reactive emissions. Results can be averaged over timeframes ranging from one hour to periods as long as one to multiple years.

When stable conditions exist in the planetary boundary layers, Stability Class F, the model assumes that the dispersion of emissions will occur in accordance with a Gaussian distribution in both the horizontal and vertical axes. However, the behavior of the plume in the vertical axis will be altered from the Gaussian distribution based on the meteorological data that defined the nature and the duration of the atmospheric stability conditions that are expected to exist over time periods of interest and that are presented to the model as inputs.

Once site-specific characteristics that can impact plume behavior, such as topography, surface

roughness, solar radiation, and physical obstructions, are identified, they can also be provided as model inputs.

Slide 4, please.

As I mentioned, the model has widespread applicability: rural or urban areas, flat or complex terrain, surface level versus elevated releases, single or multiple sources, point sources, area sources, line sources, volume sources. And the model can provide data and evaluations over a variety of time intervals.

Slide 5, please.

A little bit about the AERMOD model architecture. AERMOD consists of one main program and two primary pre-processing programs, AERMET and AERMAP, and other pre-processing programs that can be used when they are relevant.

AERMET is a pre-processing program for the meteorological data inputs in order to calculate those conditions within the planetary boundary layer.

AERMAP pre-processes terrain data using digital elevation data from the USGS, the U.S. Geological Survey.

AERSURFACE is another prep-processing program that can be used to further define surface

characteristics.

Other capabilities which were not applied in the EREF scenario because they lacked relevance are the ability to model for ozone and lead and the ability to model for the downwash effect on a dispersing plume from nearby tall structures.

Slide 6, please.

Let me talk about the AERMOD inputs. Surface hourly meteorological data are the primary inputs. Ambient temperature; wind speed and direction at either one or multiple levels, ideally multiple levels; station pressure. Station pressure is used by the model to estimate the density of dry air that is likely to exist in the area being modeled. Sky condition; standard deviation of wind direction fluctuations, which obviously affect the direction in which the plume will disperse, and upper sounding data that will allow you to estimate whether or not there are inversion conditions.

Slide 7, please.

There are three surface characteristic data that are essential inputs to the models. The first is surface roughness. Surface roughness is a measure of the irregularities at the surface, including those caused by vegetation or topography or

structures and which alter the direction of the near-surface winds. Surface roughness plays a very critical in determining the magnitude of the mechanical disturbance and the stability of the boundary layer that is created by those features.

Typical values for surface roughness: 0.001 meters, .003 feet of vertical turbulence could be expected over calm water surfaces; whereas, as much as 1 meter, or 3.3 feet, of additional vertical movement could be expected over a forest or urban area with higher surface roughness values.

Albedo is a reflection coefficient of solar radiation. It is the ratio of the amount of radiation incident on a surface to the amount of radiation that is reflected from that surface. Typical values range from 0.1 for thick, deciduous forest to 0.9 for fresh snow.

Albedo is used by the model to determine the proper amount of convection that can be expected to be occurring in the planetary boundary layer as a result of heat energy being radiated back from the surface of the earth. Highly-reflective surfaces such as fresh snow could induce vertical mixing because of reflected heat energy at pretty substantial amounts. At the other extreme, heavily-vegetated cover acts as

a heat sink and allows very little incident heat energy to radiate back into the planetary boundary layer.

And finally, the Bowen ratio. The Bowen ratio is an indicator of surface moisture. It's the ratio of sensible heat flux to latent heat flux, and it's used to determine in the planetary boundary layer parameters for convective conditions the typical values ranging from 0.1 over water to 10 over desert at midday.

Over water bodies, the Bowen ratio describes heat transfer that are occurring, sensible heat that is manifested as a change in temperature or latent heat that is manifested as an increase in water vapor in the planetary boundary layer due to evaporation.

In practical terms, for the EREF scenario, when no large water bodies exist, the Bowen ratio describes the manner in which heat incident on the ground surface promotes warming of the atmosphere and increases in near-surface relative humidity to soil moisture evaporation.

Slide 8, please.

Those are the meteorological and surface data inputs that are required for the model. The next

order of business is to find those data.

Ideally, meteorological data would be developed on the site that was undergoing modeling. It's rarely the case that you have that opportunity. However, in this particular case for the EREF site, we are fortunate for the fact that there is a National Weather Service Station at what is known as the Materials and Fuels Complex at the Idaho National Laboratory, which is approximately 11 miles to the west of the EREF site.

Data collected at official stations of the National Weather Service provide the highest confidence. Measuring instruments are subjected to robust calculation, and measurement protocols and raw data collected at those stations are subjected to many quality control evaluations before they are being posted to the National Weather Service official databases.

So, while some data may be available at closer locations to EREF, which was not the case in this particular case, the preference is to use National Weather Service data whenever possible.

To ensure that the data are representative over long-term conditions and are not influenced by unusual short-term conditions, five years of

continuous data are typically used. The last five years available on National Weather Service databases are typically used.

I should say, also, that in deciding to use the National Weather Service at the MFC Complex, we consulted with National Weather Service personnel stationed here in Idaho, and they concurred that the MFC data was the best possible data for use as meteorological inputs to the AERMOD model for EREF purposes.

JUDGE LATHROP: When you talk about hourly surface data, is that hourly for five years?

MR. KOLPA: Yes.

JUDGE LATHROP: So, that's available?

MR. KOLPA: Yes. A substantial amount of data, yes.

In fact, the model requires the data stream to be continuous. So, in those occasions and over those time periods when the selected station is not producing data, either because of equipment undergoing calibration or equipment down for maintenance, we have to find alternative data to replace those missing data. And in fact, in this particular case, that data came from the Idaho Falls Regional Airport, Fanning Field, again, another

National Weather Service Data Station, and it replaced the data, and only the data that was not available for particular hours over that five-year timeframe from the MFC station.

And, then, finally, upper sounding data, it was an easy decision on where to get that. There is only one station in Idaho that does upper sounding station for purposes of identifying the potential for inversion conditions, and that's at the National Weather Station in Boise. So, that, too, that data was gathered from National Weather Service databases and input into the model.

JUDGE BOLLWERK: Before you go on, can I ask one question of AREVA, actually?

I noticed yesterday on the site visit, as we were coming out, there appeared to be a Weather Station right at the base of the highway, Highway 20. And you don't have at this point answer my question. I'm just wondering, is that a new Weather Station? That will be something that you will be using at some point?

And if you want to talk with him and give us the information later, we don't need to do it right this second. I just was interested. It is sort of a point of information, not necessarily evidentiary.

I appreciate it. Thank you.

MR. KOLPA: To further refine that surface roughness parameter that is an essential input to the AERMOD model, we gathered surface wind data measured at elevations of 1.5 meters, 5 feet, at the nearest airport and used that data to help define the surface roughness characteristics at the EREF site. There are three airports within a 50-mile radius of EREF: Idaho Fall, Pocatello, and Rexburg. Idaho Falls is 31 kilometers away. Pocatello is 76 kilometers away. And Rexburg is 58 kilometers away.

Because of its proximity to the EREF site, and because of the similar topography, hourly surface wind data from the Idaho Falls Fanning Field were used to estimate that surface roughness characteristic of the planetary boundary layer.

And as I had mentioned previously, the upper sounding data, twice daily, were gathered from the National Weather Service Station at Boise, the only place in the State where such data is collected.

Slide 9, please.

Additional inputs to the model. To help the model understand the surface characteristics over which that dispersing plume will pass, terrain data; elevation data from the USGS Digital Elevation Model;

again, data mapped for the MFC, which in our application of professional judgment represented a set of topographic conditions that were virtually the same as those that existed at EREF and, therefore, representative of surface characteristic data that you could expect to find at the EREF site.

Both MFC and EREF sites are located in the middle of the Eastern Snake River Plain, a wide, flat, bow-shaped depression extending about 400 miles. The elevation and terrain features and the land uses surrounding the MFC area are considered to be comparable to those at EREF.

Slide 10, please.

Oh, I'm sorry, one more point. The model required an albedo value to be assigned. And we decided, based on the conditions at EREF with regard to land surface, with regard to vegetation, we decided that the shrub land, bare soils, sand, and rock albedo value that EPA has published is the one most representative of the EREF site. So, that's what we told the model to act against.

Slide 10.

With those inputs secured, we needed to identify the sources of emissions. And for the preconstruction and construction activities, we

identified a number of activities from the EREF that could be sources of emissions of criteria pollutants or particulate. And I have listed what we considered to be some of the major sources here on this slide.

JUDGE LATHROP: As you said, you can represent sources as point or line or area sources. How did you choose to represent the sources of dust from moving vehicles?

MR. KOLPA: We represented it generally as an area source because at the time we were doing this modeling there was no definition of where those construction roads were going to be on the site. We, obviously, expected they would be extending from Highway 20, but we didn't know what the path would be. Now, if we had a precise path, we could have identified that as a line source, but, instead, we identified the active construction area as an area source.

JUDGE LATHROP: Is it fair, in terms that are meaningful to me, this code is three space dimensions, is that right?

MR. KOLPA: Yes.

JUDGE LATHROP: And time-dependent?

MR. KOLPA: Yes.

JUDGE LATHROP: On an hourly, is the time

interval hourly?

MR. KOLPA: Yes.

JUDGE LATHROP: And it has all of these calculations that are made for Gaussian sources?

MR. KOLPA: The model's default value is Gaussian, but, then, as you add inputs to the model, the model knows to adjust the Gaussian, at least in the vertical, based on those characteristics of turbulence and those characteristics of surface roughness and Bowen ratio and albedo.

JUDGE LATHROP: And those are adjusted spatially?

MR. KOLPA: Yes.

JUDGE LATHROP: And typically, over what area do you model, the whole site?

MR. KOLPA: We modeled over the whole site. We were interested, most importantly, in what the values would be at the property line of a dispersing plume. So, we looked at the closest distance from the active construction area within the EREF property, and we looked for the closest site boundary. And that was the distance at which we asked the model to provide a result.

JUDGE LATHROP: So, what kind of a spatial resolution did that result in?

MR. KOLPA: Well, again, all of the active construction area was considered to be one single area source, even though within that area there may have been ground disturbances occurring in one corner of that area while there were road travels occurring in another, while there was wind erosion occurring over stockpiled soil in a third.

But, again, because the construction plan that was available to us at the time we did this model did not have that specificity, we considered all to be within a single active construction area.

JUDGE LATHROP: So, you took estimates of these various individual sources and did some averagings to represent this as one area source?

MR. KOLPA: Yes. Again, from what was offered by AREVA in the ER, we identified -- I have it; it's coming up in a later slide -- we identified a total area, an active construction area of 89.4 hectares, 221 acres.

At any given time, there would be activities that would be sources of criteria pollutants or sources of fugitive dust.

JUDGE LATHROP: Thank you.

JUDGE BOLLWERK: Does modeling it that way tend to make the outputs more conservative in some

way, area versus line? I'm a little bit out of my --

JUDGE LATHROP: No, no, that's a good question. Do you consider the calculation you did to be bounding in some --

MR. KOLPA: The calculation that was done was all that could have been done, given the amount of detail that was provided in the construction plan. With a more detailed construction plan, there could have been a series of models done that would have provided results of potential impacts from each type of activity at each location where that activity was expected to be occurring.

JUDGE LATHROP: Did you do a sensitivity study of the changes in the input parameters to see what effect they had on the output?

MR. KOLPA: No, we did not.

JUDGE LATHROP: So, to answer the question about whether it is conservative or not, you are not in a position to say?

MR. KOLPA: No.

JUDGE LATHROP: Okay.

MR. KOLPA: Slide 11.

In addition to understanding the activities that would have been sources of pollution and emissions that were being modeled, we needed to

understand durations and scales of activities. And again, we drew from what was provided by AREVA in their Environmental Report the tentative construction activities as were described there.

We looked at construction schedules. We looked at duration of activities, the size of an affected area, the active construction zone, the scale of the activities, the number of workers, the equipment operating characteristics, and use dependent on activities, such as soil conditions and intended mitigation measures that AREVA had indicated also in their ER was their intention to apply.

We thought, given what was available to us, that the inputs to the model were generally conservative. We thought that the materials and the information that AREVA presented in their Environmental Report was consistent with what we would be expecting to happen at an industrial construction area of the size and magnitude of EREF. And we made no corrections to the AREVA inputs or the AREVA data that was in their ER as they were input into the model.

We also evaluated, as I said, the mitigation measures that were proposed by AREVA for both preconstruction and construction-related impacts

to determine whether or not they should be applied to reduce the potential impact of individual sources or activities on the ambient air quality. And again, we applied professional judgment as to how those mitigating effects would be addressed in the model.

There were some additional modeling assumptions that helped to refine the result. Vehicles and equipment would be maintained in -- I'm sorry, slide 12. Vehicles and equipment would be maintained in the proper condition.

Low-sulfur diesel fuel would be used in all the diesel-powered vehicles and equipment. As is the case now, low-sulfur diesel fuel is required for onroad diesel engines, but it is not required for construction equipment. Construction equipment can still use a higher-sulfur diesel. But, as a practical matter, most refineries don't have the capacity to generate both. And so, they are generating primarily low-sulfur diesel, and we assumed that would be the case here. So, that the road graders and the other pieces of equipment that are not road-worthy that would stay on the site throughout the construction period were using the same low-sulfur diesel as the trucks delivering materials and equipment to the site were using.

We assumed that the majority of the materials and equipment delivered to the site would be coming from Idaho Falls, and that the workforce would be commuting from Idaho Falls. And again, no credit was being assigned to buses or carpools.

We assumed that what AREVA offered in terms of best management practices would, in fact, be implemented.

And based on the evaluations of others in the EIS team, we understood the particle size for surface soils that we should inform the model about would be consistent with high-silt-content soils that are known to be present at the AREVA site.

And as I mentioned earlier, we assumed that a disturbed area of 89.4 hectares, 221 acres, would be in operation in a state of disturbance at any given time. That would give the AREVA construction crews the ability to operate in various areas of the AREVA site simultaneously.

And finally, the average day, 10-hour workday, 21 days each month.

Slide 13.

To estimate emissions, we have to inform the model with --

JUDGE WHITE: Excuse me. I just had one

question after actually being out there and seeing this place.

With regards to the soils, was there any input that took into account the depth of unconsolidated material? Or what was the assumption of thickness of material that was capable of being mobilized?

MR. KOLPA: Well, certainly, for the roads, the assumption was that it would be at least 2 feet down below the surface. For the foundations, deeper. But, as you know from being there, there is a lot of bedrock outcropping. And so, it's not clear until you actually start digging the hole, I think as was suggested by AREVA, as to just how far down the soil mantle goes and where you hit the bedrock. So, we had no way to estimate a depth in that regard. And so, we did not.

JUDGE WHITE: So, there isn't any factor in the input that actually deals with -- well, as I said before, I guess -- thickness of unconsolidated material? If the soil is 2-feet deep, the model assumes that all 2 feet of that are capable of being mobilized, is that --

MR. KOLPA: That's correct.

JUDGE WHITE: I see. Okay. Good.

MR. KOLPA: Slide 13.

Again, we had to inform the model as to what the emissions would be from each of these activities. And in fact, there are emission factors published by the Environmental Protection Agency in their document AP-42, which was published initially in the 1970s, I believe, and which continues to undergo updates. These are the particular chapters from which we extracted emission factors.

Emissions from onroad vehicles were estimated not from AP-42, but from the use of a separate EPA model, MOBILE6.2.

And to further augment the emission factors in AP-42 that related to the onsite management, storage, and handling of petroleum fuels, we used a separate model, EPA Model TANKS, which estimated the emission from the storage of volatile fuels in various types of storage tanks.

Slide 14, please.

Finally, all the inputs have been provided to the model. All the emission factors have been provided, the characteristics of the activities that we wanted the model to operate against.

Here are the modeling results. This is a reproduction of Table 4-5 from the Final Environmental

Impact Statement, with a slight modification. And that's the highlighting in red of the ambient air quality standards, both the National and the State Ambient Air Quality Standards, in micrograms per cubic meter, except for CO, which are represented in parts per million.

Ambient air quality standards are both primary and secondary. The primary standard is a health-based standard, and the secondary standard deals with the quality of life.

So, here are the criteria pollutants that were modeled in the lefthand column: carbon monoxide, nitrogen dioxide, sulfur dioxide, and particular matter, both 10-micron aerodynamic diameter and 2.5-micron aerodynamic diameter.

Here is the emission rate, the grams per second that the model suggested would be occurring, and the averaging time over which that emission rate was measured.

And importantly, in the next column, the background concentrations of each of these criteria pollutants. And I would like to point out especially that PM10 has a background concentration that's roughly a third of the way to the standard, 52 micrograms per cubic meter against the standard of 150

micrograms per cubic meter. So, the natural functions, the natural conditions within this area result in particulate matter being in the ambient air to that level.

JUDGE LATHROP: These emission rates are for the entire site?

MR. KOLPA: Yes, these are the emission rates that the model assumed or calculated would be occurring.

JUDGE LATHROP: Over the whole site property?

MR. KOLPA: Yes.

JUDGE LATHROP: Yes. Okay.

MR. KOLPA: So, the modeled maximum, then, is shown in the next column. And if you total the modeled maximum with the background, you get the results in the column headed "Total". And when you compare those values to the values in the column to the immediate right, to the standard for each of those criteria pollutants, you can calculate both the modeled maximum percent of standard and the total percent of standard. So, in other words, 407.2 micrograms per cubic meter for PM10 represents 236.8 percent of the modeled maximum and 271.5 percent of the total amount of PM beyond the standard.

Slide 15, please.

We believe that all of the assumptions that we used, and that we instructed the model to use, were conservative. And based on our review of the modeling results, we determined that all of the National Ambient Air Quality Standards except for particulate would likely be met at the EREF property boundary under any condition. But particulates exceeded the standard at the property boundary primarily because of fugitive dust.

It is important to also note that the particulate concentrations are very sensitive to wind speed. Low wind speed can result in the least amount of dust dispersion once that particulate is airborne and, therefore, the highest fugitive dust concentrations in downwind directions.

And EPA has, in fact, recognized that low wind speeds do introduce that positive bias in AERMOD and has indicated their intention to address that in future AERMOD model modifications. That is a problem that is becoming increasingly more prevalent as the National Weather Service Stations that are providing the meteorological input data are moving from mechanical cup anemometers for wind speed measurement to sonic anemometers or electronic anemometers that

have a much lower wind speed sensitivity. So, the wind speeds that are provided to the model are going down, if you simply apply the National Weather Service databases.

In the case of the EREF model, the default calm wind speed, represented at MFC, falls exactly into that category. It was measured at 0.134 meters per second, 5.2 inches per second. That is the lowest sensitivity of the wind-speed-measuring instrument at the MFC station.

For the initial modeling, that is the data that was input to the model without modification. But, in order to explore just exactly how much bias was being introduced, we ran an additional model, and in this case told the model that the calm wind speed at the MFC was not 0.134 meters per second, but 1.0 meters per second, a much higher calm wind speed, and asked the model to process the data using that as inputs.

Slide 16, please.

Here's the result of processing all the meteorological data from MFC, but altering all of the low wind speed data from .134 meters per second to, instead, 1.0 meters per second. The first three columns on the left, averaging time, the standard, and

the background, are the same as what you saw in the previous table. The next column, titled "Modeled Maximum at Calm Wind Speed of .134", are the results that you also saw in the previous table, just exactly what the model provided using the data without modification from the MFC station.

And the result, in the next column, as you saw in the previous side: PM10, 24 hours standard, was a total of 407.2 micrograms per cubic meter. Now compare that to the final result in the far right column for PM10 of 161.3 micrograms per cubic meter. That reduction from 407.2 to 106 -- I'm sorry. Compare 407.2 to 241.9, the second-from-the-right column for PM10. That's the reduction that results if you remove that low wind speed bias from the model and tell the model, instead, that the lowest wind speed it should act on is 1 meter per second.

That is still in exceedance of the standard. That's 161 percent of the standard. But that exceedance has been reduced from the 271.5 percent the standard using the legitimate data from MFC.

So, indeed, there is a bias in the model, and EPA acknowledges that. And EPA is intending to make modifications to address it, but they have not

done so yet. So, for purposes of regulatory compliance, the results of our first model run using the MFC data as it was collected are the valid results. So, we do have exceedances of both PM10 and PM2.5 under calm wind speed conditions.

Slide 17, please.

Wind speed, wind direction, and wind frequency that are extracted from the meteorological data at the MFC site can be used to produce a wind rose. And what you see here is the wind rose for EREF for that five years of meteorological data that were the meteorological data inputs to the model.

The wind rose, beyond looking simply at numbers, the wind rose gives you a more graphical representation of where you might expect to see the impacts of a dispersing plume. The wind rose actually provides quite a bit of data. It shows the annualized compass directions, the intensity and the frequency of the winds at the EREF site.

The direction of each of the bars is the direction from which the wind blows. So, obviously, the direction from the Southwest is the most predominant wind direction at EREF. Each bar is composed of segments, each representing a range of wind speeds. And you can see the key to the righthand

side of the wind rose. And the length of each wind speed segment in each bar represents the percentage of time that winds within that speed range occurred, while the overall length of the bar, as I said, represents the percentage of time that winds of all speeds blew from that direction.

JUDGE LATHROP: As just a point, are wind roses normally circular?

MR. KOLPA: I'm sorry, meaning?

JUDGE LATHROP: This is an ellipse.

MR. KOLPA: Yes, they are circular. I think this was, as it was expanded to fit the screen, it might have gone to a non-round condition. But, yes, indeed, the wind rose as you produce it is circular.

So, the wind rose can be used to further interpret the results of the modeling study. You know from your visit there Monday that Highway 20 is due south of the facility, and south of that is Hell's Half Acre, one of the hiking areas in the area. But you can see from this wind rose that, if a dust cloud were being produced during construction or preconstruction, the likelihood is that it could be moving away from those critical areas. Now that's not to say that it would always move away, because you can

see that there are winds represented in virtually every compass direction from that wind rose. But it does give you a sense of the probability of where you would most likely and how frequently you would see impacts at the boundary of the EREF property and in which direction.

Slide 18, please.

Finally, the conclusions: the staff used AERMOD for evaluating the impacts to ambient air quality of the EREF preconstruction and construction activities. The results presented in the Final Environmental Impact Statement were based on the application of what the staff believed were adequate and representative inputs and conservative assumptions, based on professional judgment.

Modeling demonstrated that particulate concentrations could be greater than the National Ambient Air Quality Standard for those particulate categories at some EREF property boundary under some meteorological conditions.

And we further conclude that successful execution of best management practices and appropriate mitigation would minimize, and perhaps even prevent, the exceedance of any National Ambient Air Quality Standard throughout the period of preconstruction and

construction.

That concludes my presentation.

JUDGE LATHROP: Are you familiar with the testing that the EPA has done of this seemingly infinitely-capable AERMOD program?

MR. KOLPA: I am not an expert in air modeling. I don't follow it religiously. But I can tell you that and its contractors, especially at its facilities at Research Triangle Park, are working for continuous improvement of AERMOD.

JUDGE LATHROP: So, they must have some kind of standard against which to test it.

MR. KOLPA: Well, I think they are testing it against empirically-measured results to see whether or not --

JUDGE LATHROP: Sure.

MR. KOLPA: -- the model actually verifies what was actually collected.

JUDGE LATHROP: Well, that's the definition of verification, how it works in the real world.

MR. KOLPA: Yes.

JUDGE LATHROP: But you personally don't know what they have done? Because many, many approximations are made, clearly.

MR. KOLPA: Yes. Yes.

JUDGE LATHROP: And so, there must be some way to tell how well it's doing.

MR. KOLPA: Well, even as EPA acknowledges the shortcomings of the model -- and you can imagine that a model based on so much data does have some potential to misrepresent the condition -- even as they recognize that, they also acknowledge and believe that that is the best approximation that is available. And it is, indeed, used for regulatory purposes to determine whether someone is complying with permit conditions or other regulatory obligations.

And it's used by states to evaluate and interpret the ambient air measurements that they make throughout the state to fashion a state implementation plan and to decide on where controls need to be most effectively applied to maintain air quality standards.

JUDGE LATHROP: So, have faith.

MR. KOLPA: Indeed.

JUDGE BOLLWERK: I noticed in reading Exhibit NRC000198, which was a description of the AERMOD model --

MR. KOLPA: Yes.

JUDGE BOLLWERK: -- it replaced another model, I guess around 2000, 2001, 2002, in that

timeframe somewhere.

MR. KOLPA: There are a number of models that are under development by EPA based on circumstances.

JUDGE BOLLWERK: Okay.

MR. KOLPA: AERMOD is the one that EPA currently considers to be most applicable to the situation that we had at EREF.

JUDGE BOLLWERK: Okay. I guess I'm just interested, I mean it sounds like constant development. This one is now approximately 10 years old.

MR. KOLPA: Yes.

JUDGE BOLLWERK: Does that begin to cause concerns or, as you mentioned, since they are trying to continually update it -- do you have the same situation where the other one just became outdated and I guess they tried as much as they could to keep the parameters on that one and then update it and make it better?

MR. KOLPA: Right. The model is 10 years old, but the input parameters are still legitimate. They are still the same input parameters that were identified as being essential when the model was first collaborated between AMS and EPA.

So, it's not so much that the parameters are changing. It's the way in which the model uses its own internal processes to decide its going in the right direction or to make internal corrections.

And they are also refining the model to make sure that it's available for modeling very unique situations.

JUDGE BOLLWERK: And recognizing that you said you basically used what the ER gave you, I guess that -- and maybe you said this as well -- the assumption is that there wasn't something else you would have preferred to have had, and you were willing to go with what they gave you? Or there certain preferences; you would have had other information, if you could have gotten it?

MR. KOLPA: No, I meant to imply from that that what was provided by the ER, given the stage of development of the construction plan -- and you heard in earlier testimony today that some of the details have yet to be defined even now -- we determined that what ER, what AES had provided in the ER was, in fact, reasonable and appropriate and generally sufficient for describing a construction activity, as we would have expected it to occur to build something like EREF.

JUDGE BOLLWERK: All right.

Do you have any further questions?

JUDGE LATHROP: No.

JUDGE BOLLWERK: No?

Any questions, Judge White?

JUDGE WHITE: No.

JUDGE BOLLWERK: All right. At this point, then, if there are no other questions from the Board, we appreciate very much your service to the Board and your coming and speaking with us today and providing us the information, both for this topic and the previous one. Thank you.

MR. KOLPA: Thank you.

JUDGE BOLLWERK: All right. At this point, it's about 4:30, and I think we have, at least according to the listing, we have approximately another hour or half, or thereabouts, of information. So, I'm going to suggest that perhaps for today we call it a day and everybody go back and relax and kind of regroup for the morning.

One thing I would raise with you all, it looks like we're talking about an hour and a half to two hours tomorrow, although, again, once we get into it, who can tell what will happen? I think it would behoove us to probably try to avoid a luncheon break,

given that the biggest problem being that, if we go a little longer, we can't really control -- I mean we kind of need to be out of there be quarter to 12:00. And if that's the case, then we have to take the lunch break, I guess is what I'm trying to say.

Would you all have an objection to starting a little earlier tomorrow morning, just to make sure we can avoid that possibility, or to help avoid it, if possible?

MS. LEMONCELLI: No objection whatsoever, Your Honor.

JUDGE BOLLWERK: Well, the Board is willing to start at either 8:30 or nine o'clock. Do you have a preference?

MR. CURTISS: The earlier, the better, from our perspective.

JUDGE BOLLWERK: I don't want to pull anybody out of bed too early. On the other hand, we could be here as early as 8:30. Or, if nine o'clock is the preference, we can certainly do that.

MR. CURTISS: 8:30 is fine with us.

JUDGE BOLLWERK: Huddle for a second and talk about it. It's certainly all right with us. Do you want to take a quick, brief break? We can do that.

MS. LEMONCELLI: Just one moment, Your Honor.

With an extra cup of coffee, Your Honor, the staff is amenable to convening at 8:30.

JUDGE BOLLWERK: All right.

MS. LEMONCELLI: Thank you.

JUDGE BOLLWERK: We can do that then. All right. We will go ahead, then, and plan on convening at 8:30 tomorrow.

I think we represented in The Federal Register notice that we put out that, if we had a change in the schedule, we would try to update a phone line that we have. I don't know how many members of the public would be interested in coming tomorrow and would be concerned about missing part of it, but we will go ahead and update that phone line, do the best we can.

I think trying to update the NRC website would be not a useful endeavor. It would probably happen by the end of the week.

(Laughter.)

So, the phone line is something we can do fairly rapidly, and it will be there for anyone that's interested.

So, all right. We had mentioned also

earlier that you all were going to have some discussion about the Commission's further -- I don't want to say; obligation is not the right word -- further activities that we need to undertake. And I take it you want to talk with us about that tomorrow? You still need to talk this evening, I think, or --

MR. CURTISS: I think, based upon our discussions during the break, we will be in a position, I think, to jointly present a view about how we think the Board should proceed.

JUDGE BOLLWERK: All right.

MS. LEMONCELLI: That is the staff's hope as well, Your Honor.

JUDGE BOLLWERK: Okay. So, we can do that tomorrow. We plan, then, after we finish the presentations tomorrow, we will go ahead and talk about that at that point. I think that will be another task we need to make sure we undertake and complete tomorrow.

All right, then, do either of the judges have anything at this point?

JUDGE LATHROP: No.

JUDGE BOLLWERK: All right. I would like to say, on behalf of the Board, that we found the presentations today very useful, and we appreciate the

time and effort that the witnesses put in to preparing it and providing the presentations to the Board.

And perhaps tomorrow morning you can let me just know about that little tower that I saw.

MR. CURTISS: I have the answer here.

JUDGE BOLLWERK: Oh, all right. That's fine. We'll take it now then.

MR. CURTISS: I consulted with the expert on that.

JUDGE BOLLWERK: Okay.

MR. CURTISS: The Met Station that is there is apparently of limited reliability and limited data, and it would be AES's intention to have a Met Station that addresses all of its needs on the site.

JUDGE BOLLWERK: Okay. That will be in the future, when you move forward?

MR. CURTISS: Yes.

JUDGE BOLLWERK: Okay.

MR. CURTISS: So, it will not be using that Met Station that you saw.

JUDGE BOLLWERK: Okay. All right. Okay. All right, very good.

Anything else, then, from either of you?

JUDGE LATHROP: No.

JUDGE WHITE: No.

JUDGE BOLLWERK: All right. Then, at this point, we stand adjourned until 8:30 tomorrow morning.

Thank you very much.

(Whereupon, at 4:27 p.m., the meeting in the above-entitled matter adjourned for the day, to reconvene the following day, Wednesday, July 13, 2011, at 8:30 a.m.)