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1	UNITED STATES OF AMERICA
2	NUCLEAR REGULATORY COMMISSION
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4	578TH MEETING
5	ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
6	(ACRS)
7	OPEN SESSION
8	+ + + +
9	THURSDAY, DECEMBER 2, 2010
10	+ + + +
11	ROCKVILLE, MARYLAND
12	The Advisory Committee met at the Nuclear
13	Regulatory Commission, Two White Flint North, Room
14	T2B1, 11545 Rockville Pike, at 8:30 a.m., Said Abdel-
15	Khalik, Chairman, presiding.
16	COMMITTEE MEMBERS:
17	SAID ABDEL-KHALIK, Chairman
18	J. SAM ARMIJO, Vice Chairman
19	JOHN W. STETKAR, Member-at-Large
20	SANJOY BANERJEE, Member
21	DENNIS C. BLEY, Member
22	MARIO V. BONACA, Member
23	CHARLES H. BROWN, JR., Member
24	MICHAEL L. CORRADINI, Member
25	DANA A. POWERS, Member
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1	HAROLD B. RAY, Member
2	JOY REMPE, Member
3	MICHAEL T. RYAN, Member
4	WILLIAM J. SHACK, Member
5	JOHN D. SIEBER, Member
6	NRC STAFF PRESENT:
7	FRANK AKSTULEWICZ, NRO/DNRL/DDLO
8	TOM BERGMAN, NRO/DE
9	JOHN DAILY, NRR/DLR
10	CLIFF DOUTT, NRR/DLR
11	MELANIE GALLOWAY, NRR/DLR
12	ALLEN HISER, NRR/DLR
13	GARY HOLAHAN, NRO/DD
14	WILLIAM HOLSTON, NRR/DLR/RAPB
15	JOHN S. MA, NRO/SEB1
16	EILEEN MCKENNA, NRO/DNRL
17	JAMES MEDOFF, NRR/DLR
18	PRAVIN PATEL, NRO/DE
19	BO PHAM, NRR/DLR
20	JOSE PIRES, RES/DE/SGSEB
21	BRET TEGELER, NRO/SEB1
22	BRIAN THOMAS, NRO/SEB1
23	KENT L. HOWARD, SR., Designated Federal
24	Official for Kewaunee Power Station
25	License Renewal
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2	NRC STAFF:
3	WEIDONG WANG, Designated Federal Official for
4	Westinghouse AP1000 DCD
5	PRESENT FROM DOMINION:
6	PAUL AITKEN
7	TIM HANNA
8	MARC HOTCHKISS
9	JAMES KASPER
10	ALLEN PRICE
11	STEVE SCACE
12	MICHAEL WILSON
13	WILLIAM ZIPP
14	PRESENT FROM WESTINGHOUSE:
15	TIM ANDREYCHEK
16	MICHAEL CORLETTI
17	RICHARD ORR
18	TERRY SCHULZ
19	AMIT VARMA
20	ROLF ZIESLING
21	ALSO PRESENT:
22	ROBERT H. LEYSE*
23	LOUIS ZELLER, Blue Ridge Environmental Defense
24	League*
25	*Present via telephone
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1	PROCEEDINGS
2	(8:30:05 a.m.)
3	CHAIRMAN ABDEL-KHALIK: The meeting will
4	now come to order. This is the first day of the $578^{ ext{th}}$
5	meeting of the Advisory Committee on Reactor
6	Safeguards. During today's meeting, the Committee
7	will consider the following. One, Final Safety
8	Evaluation Report associated with the licensed renewal
9	application for the Kewaunee Power Station. Two,
10	Final Safety Evaluation Report associated with the
11	amendment to the AP1000 Design Control Document.
12	This meeting is being conducted in
13	accordance with the provisions of the Federal Advisory
14	Committee Act. Mr. Kent Howard is the Designated
15	Federal Official for the initial portion of the
16	meeting. Portions of the session dealing with the
17	FSER associated with the amendment to the AP1000
18	Design Control Document may be closed to protect
19	information that's proprietary to Westinghouse.
20	We have received written comments, and a
21	request for time to make an oral statement from Mr.
22	Bob Leyse during the discussion of the Kewaunee
23	license renewal application.
24	There will be a phone bridge line.
25	Members of the NRC Staff and INPO will be listening to
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the Kewaunee license renewal discussions. To preclude interruption of the meeting, the phone line will be placed in a listen-in mode during the presentations and Committee discussions.

A transcript of portions of the meeting is being kept. It is requested that speakers use one of the microphones, identify themselves, and speak with sufficient clarity and volume so that they can be readily heard.

I will begin with some items of current 10 11 interest. Dr. Mario Bonaca will be retiring from ACRS at the end of his current term on January 6, 2011. 12 Bonaca has served on the Committee since 1999. 13 Dr. 14He served as ACRS Chairman from 2003 to 2004, and then 15 2009. Dr. Bonaca has made aqain in numerous 16 significant and lastly contributions to ACRS reviews, 17 especially in the areas of plant license renewal, 18 power uprates, and safeguards and security. His 19 valuable contributions and professionalism are very much appreciated. His dedication and camaraderie will 20 21 be greatly missed. Please join me in thanking Dr. Bonaca for his distinguished and dedicated service to 22 23 this Committee, and to the nation. Thank you.

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(Applause.)

CHAIRMAN ABDEL-KHALIK: Mr. Neil Coleman

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will be retiring at the end of December 2010. He is a 1 2 veteran of the U.S. Navy with more than 32 years of federal service. 3 He began his NRC career in the 4 Office of Nuclear Materials and Safeguards in 1983, 5 and joined the ACRS/ACNW Office in 2002 as a Senior Staff Scientist. He supported the Advisory Committee 6 7 on Nuclear Waste in reviews of radiation protection, 8 Mountain Site Characterization, Yucca and site 9 Since 2008, he has worked on the decommissioning. ACRS Staff supporting the siting, the US APWR, and the 10 11 Radiation Protection and Nuclear Materials 12 Subcommittees. Mr. Coleman's outstanding support to both ACRS and ACNW on complex technical issues is very 13 much appreciated. We wish him well in his future 1415 endeavors. 16 (Applause.) 17 CHAIRMAN ABDEL-KHALIK: We will now proceed item on the agenda, Final 18 to the first Safety Evaluation Report associated with the license renewal 19 application for the Kewaunee Power Station. 20 Dr. 21 Bonaca will lead us through that discussion. Dr. 22 Bonaca. 23 MEMBER BONACA: Thank you, Mr. Chairman. 24 A Subcommittee meeting was held on August 25 to review the SER with Open Items for 18, 2010 **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701

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Kewaunee. At that time, there were four open items, and they will be addressed today, and their closure will be discussed today.

I would like also to add that since the SER was issued on November 2010, the Staff received supplemental information from the Applicant that expanded the scope and/or the means, or detection of aging effects in several license renewal programs. And that will be discussed here.

10 The problem that we are having is that the 11 supplemental information was provided to the ACRS on November 30th, and came to the members yesterday, so 12 we have not had a chance to review it thoroughly. 13 We 14will listen to the presentation by the licensee, and then decide how to handle this, so far as issuance of 15 16 a letter. One possibility that I seem to believe that 17 is feasible would be for us to, if there is consensus 18 by the Committee, to generate a letter, and to hold however, until a is 19 it, Final SER issued that documents these additional changes, or whatever means 20 21 the Staff decides to use to document the receipt of 22 these RAIs. So, with that, I will turn to Ms. 23 Galloway, and she may want to tell us about it.

MS. GALLOWAY: Yes. Thank you, Dr. Bonaca.
My name is Melanie Galloway. I'm the Deputy Director

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of the Division of License Renewal. On behalf of the License Renewal Staff, we are happy to be here today to present our review findings associated with Kewaunee license renewal application.

Sitting with me are John Daily, who's the 6 Senior Project Manager responsible for shepherding the 7 license renewal of Kewaunee Station through the 8 Staff's technical process, and Bo Pham, who's the project Branch Chief associated with license renewal for Kewaunee. Brian Holian, the Director of the 11 Division, is not able to be here today, as he is 12 acting as the Deputy Regional Administrator in Region 13 IV.

14 Over the last several months, we have 15 undertaken a concerted effort to look at all the current Staff positions, and insure ourselves that we 16 17 at the Staff level have addressed each one of them for the in-house application. Kewaunee was included in 18 As a result of our review, we did 19 that review. 20 identify that there were several gaps in our review. 21 As a result of that, we have issued RAIs to Kewaunee, 22 and they have addressed each of those issues, so they 23 are currently now resolved. But as Dr. Bonaca 24 mentioned, the timing of that review was not such that 25 it was supportive of the point in time in the schedule

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that we were already with in Kewaunee, so we are apologetic for that. We understand Dr. Bonaca and the Committee's concern regarding that timing, but we are greatly appreciative of the commitment of the ACRS to maintain the current schedule, and to allow us at the same time to insure that our technical review of aging management and license renewal issues is complete in order to support a safe license renewal.

9 Because we have received the responses 10 from the Licensee that are satisfactory to the Staff, 11 we are in the process of documenting those final 12 closeouts, and we anticipate having documentation to 13 the ACRS within the next several weeks to support your 14 schedule for providing a letter on Kewaunee License 15 Renewal.

16 So, again, thank you very much for your 17 indulgence in this as we complete our work. And, at 18 this point, I'd like to turn the presentation over to Steve Scace, the Site VP, who will lead us through the 19 Licensee's presentation. After his presentation and 20 21 his Staff's presentation, we'll turn back over to the 22 Staff, and we'll fill you in on the activities that 23 we've been undertaking, in particular, including these additional few items that we've addressed. Thank you. 24 25 MR. SCACE: Thank you, Ms. Galloway. Good

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morning, Mr. Chairman, and Committee Members, and the NRC Staff in attendance. We appreciate the opportunity to discuss our Safety Evaluation with the Committee, as well as to briefly describe the Kewaunee Power Station, its current status, and other items of interest.

We have an experienced team here today 7 8 from both our Station and our Corporate Nuclear 9 Headquarters located outside of Richmond, Virginia. I'd like to introduce some of them now. Allen Price, 10 11 our Fleet Engineering Vice President; Mike Wilson, our Kewaunee Director of Safety and Licensing; Stew Yuen, 12 our Kewaunee Engineering Director; and Paul Aitken, 13 14our License Renewal Manager. We have also brought a 15 of additional folks to insure number that any 16 questions you may bring can be readily answered.

17 Kewaunee is part of the Dominion fleet. 18 North Anna Power Station, and Surrey Power Station in 19 Virginia, and Millstone Power Station in Connecticut are our other stations. Kewaunee became part of the 20 21 Dominion fleet in July 2005, when we purchased the station from Wisconsin Public Service. 22 This station's 23 long-term future had been in question for some time, and we found it in need of an influx of resources, 24 25 both personal and capital.

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Over the last five years, we have invested significantly in both adding and developing talented personnel, and investing over \$250 million in capital improvements. This investment has paid dividends as shown in our current and recent performance, both in safety and reliability. For example, over the last three years we have risen from the lowest performing plant, as measured by the INPO Performance Index, to among those at the top.

10 Being part of a fleet clearly has its For example, the license renewal team 11 advantages. headed by Paul managed the license renewal process at 12 our other three stations. We are mindful of, and will 13 14meet our commitments made as a result of the license 15 We have the resources both at the station, renewal. and available from the fleet to do so. Once again, 16 17 it's a pleasure to be here. Unless there are any 18 questions from me, I will now turn this presentation over to Mike Wilson. 19

20 MR. WILSON: Our presentation outline for 21 today is in front of you. Just very briefly, a bit 22 about the station, and then we'll talk about the 23 technical issues in more detail.

Kewaunee Power Station is located inKewaunee County, which is in the northeast portion of

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Wisconsin on the western coast of Lake Michigan to 1 2 loop Westinghouse PWR with a Westinghouse Turbine 3 Generator, as well. You see the rated megawatt, rated 4 thermal power there 1772. Our containment design is 5 different than many in that it has a steel containment vessel, approximately a 7-foot annulus space, and then 6 7 a concrete shield building. This affords us access to 8 both sides of the containment vessel for inspections, 9 and we do 100 percent inspections of the accessible 10 areas of the steel vessel every two outages.

11MEMBER BONACA:Those are visual12inspections.

MR. WILSON: Those are visual inspections, indeed. This just shows the location of Kewaunee Power Station. Note its location about 20 miles from Green Bay, Wisconsin, and also about five miles from the dual unit Point Beach Station operated by Florida Power and Light.

Here are some milestones in the history of Kewaunee Power Station. You'll notice the two uprates that we had, 1650 megawatts was the original licensed rated thermal power, so our measurement and certainly recapture brought us to 1673, and a stretch uprate brought us to our current rated thermal power of 1772. And you'll see the operating license expiration date,

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	16
1	which brings us here today.
2	The station is operating safely, and
3	reliably with 407 days online, and we're performing a
4	winter outage in February of 2011.
5	MEMBER CORRADINI: I think you keep on
6	hitting that thing. Let's move it.
7	MR. WILSON: Thank you very much.
8	MEMBER ARMIJO: Move that microphone out of
9	your way.
10	MR. WILSON: And if there are any
11	questions, I'll before I turn it over to Paul.
12	MR. AITKEN: All right. Thanks, Mike. Get
13	some of that plant information. Again, I'm Paul
14	Aitken. I'm the Project Manager for the Kewaunee
15	Station.
16	As you can see, we had four open items, as
17	Dr. Bonaca mentioned. And we'll discuss those open
18	items, we'll give a brief overview what the issue of
19	concern was, and how we resolved them during the
20	process since the last time we met.
21	The first item had to do with the use of
22	FatiguePro software. The original application
23	identified the use of stress-based fatigue for two of
24	the NUREG 6260 environmentally assisted fatigue
25	locations, which are the charging line nozzle and the
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pressurizer surge line hot leg nozzle.

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2 Subsequently, the Staff issued an RAI 3 regarding -- requesting that we make an appropriate 4 adjustment and corrections regarding the use of 5 stress-based fatigue monitoring and re-evaluate the cumulative factor in accordance with the 6 uses 7 guidelines described in ASME Section 3NB-3200. The 8 ASME Section 3 analysis for those two locations has 9 subsequently been completed, and we reported that at 10 the Subcommittee. And the results are acceptable for 11 60 years.

12 The Environmentally Assisted Fatigue 13 Evaluations were also determined to be acceptable to 14 60 years. The information was transmitted to the 15 Staff, and the commitment is subsequently closed.

Two other locations that were beyond the 16 17 6260 locations, which were the pressurizer lower head 18 and the surge line, also utilize stress-based fatigue monitoring, and will also require re-analysis prior to 19 the period of extended operation, which is reflected 20 21 in Commitment 51 that was transmitted to the Staff 22 subsequent to the ACRS Subcommittee meeting. The open item has, subsequently, been closed by the Staff. 23

24 MEMBER ARMIJO: I have a question. How 25 significant was the change in the cumulative usage

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1	factor between the FatiguePro results and the new
2	analysis? What was the different CUFs for let's say
3	either of those two components that were re-analyzed?
4	MR. AITKEN: I think where we ended up was
5	for the Environmentally Assisted Fatigue for the
6	charging nozzle, we ended up at .046.
7	MEMBER ARMIJO: And before?
8	MR. HOTCHKISS: This is Marc Hotchkiss for
9	the Applicant. It's difficult it's actually just -
10	- not to not answer your question, but it's difficult
11	to compare the previous results with the NB-3200
12	analysis results directly, because there are so many
13	factors that feed into that sort of
14	MEMBER ARMIJO: You don't wind up with a
15	CUF in either case?
16	MR. HOTCHKISS: We have a CUF initially,
17	and I'd have to look that up in the application. That
18	was reported in the application. When we re-analyzed
19	our CUF was actually higher. However, I would
20	hesitate to conclude then that the NB-3200 analysis
21	would, necessarily, conclude a higher CUF. On an
22	economic basis, we give enough analysis to conclude
23	less than one, but less than one is the limit.
24	MEMBER ARMIJO: Yes, I understand that.
25	I'm just wondering, a lot of work has gone into this.
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1	I'm wondering how significant the change was in the
2	cumulative usage factor after you went through all
3	this work. Was it an appreciable change, or was it
4	interesting, but not significant?
5	MR. HOTCHKISS: The conclusion we reached
6	was under both analysis approaches, we concluded less
7	than a CUF of one, which is the ASME limit. And that
8	would be probably the only conclusion to
9	MEMBER ARMIJO: And you are well under the
10	CUF of one.
11	MR. HOTCHKISS: Yes. Paul mentioned that
12	charging was on the order of .4.
13	MR. AITKEN: And the surge line was .75.
14	And that's the penalty that we have to take for the
15	Environmentally Assisted Fatigue.
16	MEMBER ARMIJO: Maybe I want to ask the
17	Staff the same question.
18	MR. AITKEN: Okay. So, that was the first
19	open item. The next open item relates to the Kewaunee
20	Work Control Process Program, which is Kewaunee's
21	we call it a hybrid version of two GALL Aging
22	Management programs, which are the one time inspection
23	program, which is M32, the GALL M32 program, and the
24	Internal Surfaces Monitoring Aging Management Program,
25	which is referred to as M38.
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The Staff concerns were -- first, the 2 Staff requested some additional information related to 3 our intended sample methodology for the One Time 4 Inspection Program portion of the Work Control Process 5 Program. Next, the Staff requested some additional information related to the minimum sample size for the 6 7 periodic inspections, and the inspection frequencies 8 of the Internal Surfaces Monitoring Program. Next, 9 the Work Control Process Program is a new aqinq 10 management program for Kewaunee, but in response to a 11 previous request for additional information, we did 12 provide a couple of examples where we thought we had some -- demonstrated some OE that would provide some 13 14 additional insights into the likely effectiveness of 15 There was some confusion with that, so the program. 16 the Staff requested some clarification on that. And. 17 lastly, the Staff wanted some clarification if the 18 Work Control Program required enhancement, or if it 19 would be implemented as a new program.

So, in response to this open item, we provided some additional information to the Staff that described our approach in developing a sample size for the various materials and the scope of the One Time Inspection portion of the Work Control Program. The same methodology will take into consideration the

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various materials, environments, aging effects, as well as plant-specific operating experience for the in The sampling approach scope license renewal. is justified since one time inspections are to be performed for components that are within the scope of the water chemistry programs. And the inspection provide additional results will assurance that unexpected aging is not occurring.

9 M38, in response to a follow-up For 10 question subsequent to the ACRS Subcommittee meeting 11 in August, we provided additional commitment, which the 12 Commitment 50, to perform an audit of was surveillance and maintenance activities associated 13 14 with a group of lead components prior to the period of 15 extended operation, and every 10 years thereafter. 16 This audit will confirm the components representing 17 material environment combinations have the been 18 inspected in accordance with the Internal Inspections Surface Monitoring Aging Management Program. 19

would say, in a situation where a 20 Ι 21 material environment combination has not been 22 adequately inspected, then will perform we а 23 deliberate inspection, or inspections, as required. For the third bullet, we established a new 24 25 provide the Staff with operating commitment to

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22 1 experience related to the effectiveness of the Work 2 Control Program within two years into the period of 3 extended operation, since it is a new program, as I 4 mentioned.

Lastly, we clarified to the Staff that the Work Control Program will be implemented, and the inspections completed prior to the period of extended operation. This open item has subsequently been reviewed and closed by the Staff. Any other questions on that?

11 The next issue we'll move on to is related to the steam generator divider plate cracking. 12 On this item, the Staff requested additional information 13 14 related to the materials and construction of the steam 15 generator divider plate, and whether cracks in the 16 Alloy 600 divider plate could propagate into the base 17 material of the channel head, or into the tube sheet 18 cladding. If we determine that this condition was likely, then the Staff requested the details of an 19 inspection program be provided for their review. 20 As 21 we understand it, their request was based, in part, on 22 French operating experience where some degree of 23 cracking identified in the divider plates, was themselves. 24

MEMBER SIEBER: Do you have your original

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23 steam generator? 1 2 replaced our MR. AITKEN: We steam 3 generators in 2001. 4 MEMBER SIEBER: Okay. 5 MEMBER BONACA: And do you have the same type of steam generators before the replacement? 6 7 MR. AITKEN: Slightly modified. Maybe you 8 can bring up that --9 MR. HANNA: The basic design -- Tim Hanna 10 for the Applicant. The basic design of the steam 11 generators is the same with several design We switched to Alloy 690 thermally 12 enhancements. treated tubing, and stainless steel tube 13 support 14plates. And we replaced the lower assembly, and we 15 retained the old upper assembly, but changed out the 16 separator package, and the feed ring, and added a 17 steam flow limiter in the upper assembly. But the 18 basic design remains the same with all of the material 19 upgrades as indicated on the slide. 20 MEMBER BONACA: Since that steam generator 21 must have been operating for close to 30 years, did 22 you notice any cracking? MR. HANNA: We did not notice any cracking 23 24 in the previous steam generators. 25 MEMBER BONACA: Because if I understand, **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

24 now you're committing to inspecting to occur in the 1 2 second decade of operation of the steam generator, 3 which would be comparable to the experience from 4 France. 5 MR. AITKEN: That's correct. MEMBER BONACA: Okay. But you have no 6 7 experience of cracking before. MR. AITKEN: Right. Exactly. 8 9 MEMBER BONACA: Okay. MR. AITKEN: Yes, exactly. 10 11 MEMBER ARMIJO: How old was your -- the 12 steam generator you replaced the bottom section, was that more than 20 years old? 13 14MR. AITKEN: That was --15 MR. HANNA: The original steam generators 16 operated between 1973 and 2000, so 27 years. 17 MEMBER ARMIJO: Twenty-seven years old. 18 And then you did look at the divider plate on that 19 replaced -- the old steam generator, and found no cracking? 20 MR. AITKEN: I don't know if we --21 22 MR. HANNA: We did not perform any specific inspections for divider plate cracking on the old 23 24 steam generators, because at the time of replacement 25 there was no OE or experience with cracking. When we **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

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1	say we detected no cracking, that was through normal
2	primary site inspection and maintenance activities
3	with just looking at the divider plate when having
4	access for eddy current inspections.
5	MEMBER SHACK: Has the temperature, or the
6	operating temperature of the steam generator changed
7	over the years since you've gone through the uprates?
8	MR. HANNA: I don't I believe that it
9	has, but I don't know what the exact numbers are.
10	MEMBER SHACK: What's the current operating
11	temperature?
12	MR. HANNA: The current hot leg temperature
13	is about 601, 602 degrees for hot leg.
14	MR. AITKEN: So, we'll bounce back to the
15	presentation. So, in resolution to this item, we,
16	Kewaunee, have engaged the industry through EPRI in an
17	effort to resolve this issue, and in response to this
18	open item we initially responded that the condition
19	described by the Staff is unlikely for Kewaunee for
20	the following reasons.
21	First, the steam generators are relatively
22	new, as we just explained, and were replaced in 2001.
23	Dominion believes that the cracking of the divider
24	plate is not an immediate concern with a limited
25	service time. Next, although the divider plates are
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1	Alloy 600, the divider plate assembly welds are made
2	from Alloy 52-152, which is inherently resistance to
3	cracking caused by primary water stress corrosion
4	cracking. Also, Dominion believes that there is
5	sufficient data from the industry research that
6	supports the conclusion that primary water stress
7	corrosion cracking stops when non-susceptible
8	materials are encountered. And, lastly, Dominion is
9	not aware of any United States or international OE
10	indicating that cracking of the divider plates has
11	ever propagated into the agent tube sheets, or channel
12	heads. However
13	MEMBER SHACK: Excuse me. What's the
14	cladding on the inside of the tube sheet, the primary
15	side?
16	MR. AITKEN: It's all Alloy 600.
17	MEMBER SHACK: It's all Alloy 600.
18	MR. AITKEN: Yes, that's correct. So,
19	however, in response to this follow-up question
20	following the ACRS Subcommittee meeting, Dominion did
21	make a commitment, Commitment 49, to perform an
22	inspection of each steam generator to assess the
23	condition of the divider plate assemblies using an
24	inspection technique capable of detecting primary
25	stress corrosion cracking, if the issue cannot be
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resolved through the upcoming industry studies to the Staff's satisfaction. These inspections will be completed prior to year 50.

Dominion remains active in these forums, and if any new requirements are promulgated to the industry, then Dominion will evaluate the industry recommendations, like the other affected plants and take the appropriate actions. So, based on this response, this open item has subsequently been closed by the Staff. Any other questions related to that?

11 Move on buried pipe. This is our last 12 It relates to the ongoing issue related to open item. buried piping and underground components. 13 First, the 14Staff requested that Kewaunee identify systems with 15 in a buried or underground components that are 16 environment. The Staff also requested that we provide 17 any updates related to operating experience for the 18 buried piping that was not included in the original license renewal application. 19

So, just to spend a couple of minutes for this distinguished panel to bring you up to speed what Kewaunee has for buried piping, I thought it would be appropriate to go through a simple table to show you what systems we have, and kind of walk through how much piping we do have, and what our plans for

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inspection are, and what's cathodically protected.

So, here's a list of systems that fall in 2 3 the category of being in a direct buried or soil 4 environment. As you can see, these systems are not 5 radioactive fluid process systems. At Kewaunee, all piping and tanks that contain radioactive fluid are 6 7 located inside Class 1 structures. We have listed the 8 systems and the number of inspections that we have committed to prior to the period of 9 extended 10 operation, and then in 10-year intervals, as well as 11 if cathodic protection is in place.

Just for your information, when we do an inspection, it will encompass a minimum of 10 linear feet. So, we'll walk through this information here now for your benefit.

16 First system is circ water system. We 17 have approximately 200 feet of coated and wrapped 18 carbon steel, as well as approximately 15 feet of 19 coated and wrapped stainless steel circ water piping. We will perform two inspections, one for the carbon 20 21 steel portion, and one for the stainless steel portion 22 of the circ water system. And as indicated on this slide, 23 cathodically the circ water system is 24 protected.

MEMBER STETKAR: Paul, just out of

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1	curiosity, where do you have stainless in your circ
2	water piping?
3	MR. AITKEN: We have a very small portion
4	that's I believe it's a recirc portion of the
5	coming back to I'm sorry, it's a vent line off the
6	by the screen house.
7	MEMBER STETKAR: Okay.
8	MR. AITKEN: It's a very limited amount.
9	MEMBER STETKAR: It's just strange
10	MR. AITKEN: It is strange. Yes, you're
11	right.
12	MEMBER STETKAR: You said 15 linear feet.
13	It could be
14	MR. AITKEN: Yes.
15	MEMBER STETKAR: Okay. Thanks.
16	MR. AITKEN: Next, we have approximately
17	500 feet of diesel generator system coated and wrapped
18	carbon steel fuel oil piping, which includes fuel oil
19	supply and return piping, fuel oil storage tank bent
20	piping and day tank bent piping. A portion of this
21	piping is not cathodically protected, so we revised
22	our existing commitment, which was number four,
23	subsequent to the last ACRS Subcommittee meeting to
24	perform an inspection of this portion of the system.
25	MEMBER BONACA: That's 100 feet. If I
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1	remember, it's 100 feet.
2	MR. HOTCHKISS: Yes, approximately. Right.
3	MR. AITKEN: We will also inspect one of
4	the three fuel oil storage tanks. The tanks are
5	coated carbon steel, and are cathodically protected.
6	Lastly, we have approximately 2,350 feet
7	of coated ductile iron fire protection piping. The
8	fire protection system does have does not have any
9	cathodic protection, so the number of inspection
10	reflects the additional need for inspections. And
11	we'll do those inspections prior to, during the first
12	10-year interval, and the last 10 years. So, we feel
13	this proposed inspection scope and frequently will
14	provide reasonable assurance that the effects of aging
15	will be adequately managed prior to and during the
16	period of extended operation.
17	MEMBER STETKAR: Paul, are these inspection
18	intervals consistent with have you seen the
19	proposed guidance in Revision 2 of the GALL report.
20	Revision 2 hasn't been issued yet, but
21	MR. AITKEN: Right. And we're aware of it.
22	MEMBER STETKAR: Do you know, are these
23	inspection intervals consistent with that proposed
24	guidance?
25	MR. AITKEN: I believe they are, and I
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1	think you'll see in the next slide that
2	MEMBER STETKAR: Okay. I'm sorry.
3	MR. AITKEN: some of the other
4	requirements I think a lot of this derives from
5	GALL Rev 2.
6	MEMBER STETKAR: Okay. Thank you.
7	MEMBER BONACA: A question on the diesel
8	generator ST, one tank, repeated the inspection will
9	be always on the same tank, or can you you have
10	three tanks.
11	MR. AITKEN: Right. I think the logic
12	would be to do one tank prior to, another tank during
13	the first 10-year, and the last tank during
14	MEMBER BONACA: Third, okay.
15	MR. AITKEN: All right. So, we'll move on
16	to the next slide, just kind of summarize. I think
17	this is really the impact of GALL Rev 2 here. So, in
18	response to this open item, we provide the
19	supplemental response following the ACRS Subcommittee
20	meeting related to the buried pipe and tanks aging
21	management program.
22	We did not change the commitment related
23	to the number of inspections for each of the plant
24	systems discussed in the previous slide. However,
25	following the ACRS Subcommittee meeting, we made the
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following adjustments to our previous commitment. We 1 2 did commit to maintaining installed cathodic 3 protection system functional a minimum of 90 percent 4 of the time. Ι think that's GALL Rev 2. 5 Additionally, we will perform the annual cathodic protection surveys, GALL Rev 2. And then, 6 as I 7 mentioned, we're going to do a targeted inspection of 8 the fuel oil system, diesel fuel oil system that's not 9 cathodically protected. And, lastly, we expanded our 10 commitment to perform these inspections prior to the 11 period of extended operation, and in each 10 years during the period of extended operation, where our 12 previous commitment just had an inspection during the 13 14first 10 years. So, we did include the last 10-year 15 So, based on this information, this open interval. 16 item has subsequently been closed.

17 So, now we'll transition to what we call 18 emergent items. These issues in RAIs came up 19 following the ACRS meeting. They're not the last four issues that Dr. Bonaca mentioned, but these are the 20 21 first group of four. So, these deal with the low-22 voltage cable issue. Secondly, the Staff raised a 23 concern with Alloy 600 cladded steam generator tube sheets and the possibility for cracks in the region of 24 25 the tube-to-tube sheet region.

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Next, a question regarding whether TLA evaluations have considered the most limiting location with regards to environmental effects of cumulative fatigue usage. And, lastly, a revisit on the socket weld issue at Kewaunee. I know you're all looking forward to that.

7 The first emergent item is, All right. 8 the Staff requested that we include within the scope 9 Non-EQ-inaccessible medium-voltage of the cable 10 program any low-voltage cables that are less than 2 kV 11 and that perform a license renewal intended function. 12 And I think that was in response to Generic Letter 2007-01. 13

14Although Kewaunee has not experienced any 15 cable failures, we agreed to include four additional 16 480-volt cables in the scope of this aging management based 17 the industry operating program just on 18 experience. A quick overview indicates that two of the four cables provide service to the emergency 19 diesel generator fuel oil transfer pumps, which are 20 21 located on top of the respective buried fuel oil 22 tanks. As a result, the access manholes of the fuel oil storage tanks have also been included into the 23 24 scope of license renewal, along with a manhole east of 25 the tertiary auxiliary transformer that we talked

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about before in the pooling pit located out near the switchyard. So, that's all been included in scope.

The other two cable feeds power a fire pump and a 480 bus, 480-volt bus, but they're routed in underground duct bank, and no additional manholes are included in scope as a result of that. Lastly, Kewaunee will test the inaccessible low-voltage cables prior to the period of extended operation, and at least every 10 years thereafter.

10 MEMBER STETKAR: Paul, that underground 11 duct bank is large enough that it's accessible for 12 personnel access? Where does it drain to?

MR. AITKEN: Do you know?

MR. HOTCHKISS: This is Marc Hotchkiss.
It's actually conduit in a duct bank, so it's not accessible to the length of it. And I can't answer where it drains to. I don't --

18 MR. AITKEN: Yes, I don't have that 19 information.

20 MEMBER STETKAR: You said you didn't add 21 any manholes. Do you have some way of inspecting for 22 water accumulation in that particular run?

23 MR. AITKEN: Not the inspection -- well, we 24 did add two manholes, as we talked about on the fuel 25 oil tanks.

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1	MEMBER STETKAR: No, but you I think, if
2	I was listening, you just mentioned 480-volt cable to,
3	I think you said a fire protection, and a 40-volt
4	water control overload center.
5	MR. AITKEN: Right. Exactly.
6	MEMBER STETKAR: Something like that, that
7	are routed in
8	MR. AITKEN: Conduit.
9	MEMBER STETKAR: Conduit, whatever you want
10	to call it, not direct buried cable. And I think you
11	mentioned that there are no additional manholes added
12	to the inspection program because of that. Are the
13	existing manholes in the inspection program, do they
14	cover those particular cable runs?
15	MR. HOTCHKISS: And I think this is Marc
16	Hotchkiss, again. But as a clarification, typically,
17	it's the manhole that collects water that results in
18	potentially submerging cables, and that's why we
19	maintain manholes pumped down and dry.
20	MEMBER STETKAR: If the manhole is the low
21	point, that's true. If the manhole is not the low
22	point, it can collect and sit in the conduit
23	MR. AITKEN: That's why we commit to do an
24	inspection, and do a test.
25	MR. HOTCHKISS: Yes, we'll be testing this.
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ZIPP: Bill Zipp from the Applicant. 2 MR. We were talking about the pool pit and the manholes, 3 that's for the medium -- the existing medium voltage 4 5 cables that were already in the program. When we get to the 480-volt cables, that's inside the plant, so 6 we're looking in the pool pit and these manholes where 7 the medium voltage cables that you were asking about; 8 9 whereas, the 480 volts that I believe that are running from -- to these four other loads are downstream of 10 11 these manholes. MEMBER STETKAR: I'm still a bit confused. 12 All I'm looking for is, is there a way to determine 13 whether or not water is accumulated in those conduits 1415 that contain the 480-volt cables that you just 16 mentioned, or are you relying solely on the cable 17 insulation testing to verify the operability of those 18 cables? 19 Our intent is to MR. ZIPP: do cable testing. 20 MR. AITKEN: I don't think there's a means 21 to determine if there's water --22 MEMBER STETKAR: To determine whether or 23 24 not there's water. 25 MR. AITKEN: Yes. So, we default to the **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

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1	testing.
2	MEMBER STETKAR: Just to the testing.
3	MR. AITKEN: Right. That's correct.
4	MEMBER STETKAR: Okay. And those are for
5	the the services on those, you mentioned is a fire
6	pump and a
7	MR. AITKEN: Fire pump, and an MCC, as you
8	said.
9	MEMBER STETKAR: What's the what are the
10	loads on the MCC? Do you know quickly?
11	MR. AITKEN: Is that I was thinking it
12	was service water loads, but I'm not totally sure
13	about that.
14	MEMBER STETKAR: Oh, if it's out to the
15	intake structure, it probably is service water. Okay.
16	MR. AITKEN: Okay. We'll go on to the next
17	slide. Another item that arose subsequent to the ACRS
18	Subcommittee meeting was related to the steam
19	generator tube-to-tube sheet weld cracking. The Staff
20	was concerned that primary water stress corrosion
21	cracking could promulgate from the Alloy 600 tube
22	sheet cladding through the tube-to-tube sheet welds
23	causing a primary to secondary pressure boundary leak.
24	Although there is no reported instances of this ever
25	occurring, Dominion will develop a plan prior to the
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period of extended operation to address this potential failure.

The plan will consist of two resolution 3 4 options. First, Kewaunee will perform an analytical 5 evaluation of the steam generator tube-to-tube sheet welds in order to first establish a technical basis 6 which concludes that the structural integrity of the 7 8 steam generator tube-to-tube sheet weld interface is 9 adequately maintained, or the presence of a tube-to-10 sheet weld crack. And, next, establish a tube 11 technical basis which concludes that the steam generator tube-to-tube sheet welds are not required to 12 perform reactor coolant pressure boundary function. 13 14And if that's not possible, then Kewaunee will perform 15 a one-time inspection of a representative number of 16 tube-to-tube sheet welds in each steam generator to 17 determine if primary water stress corrosion cracking 18 is present prior to exceeding 10 years into the period of extended operation. 19

Again, based on the limited service life of these steam generators, we felt comfortable with the inspection timing. That information has been provided to the Staff, and I think it's been resolved. MEMBER BONACA: This item not discussed at all in the SER. This new item totally --

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39 MR. AITKEN: I believe it's discussed in 1 2 the SER. 3 MEMBER BONACA: Under what problem? MR. AITKEN: Yes, it was subsequent to the 5 ACRS Subcommittee meeting. We responded to an RAI. And, John, correct me if I'm wrong. I think this all 6 got pulled into the final --7 8 DAILY: The tube-to-tube sheet weld MR. 9 crack is one of the -- I'm sorry. This is John Daily, Project Manager for NRR. The tube-to-tube sheet weld 10 11 cracking issue arose subsequent to the ACRS, so that's 12 a supplemental that is not reflected in your print that you have this morning. 13 14 MR. AITKEN: Oh, it's not in the Final SER. 15 MR. DAILY: That's correct. MR. AITKEN: All right. I'm sorry. 16 17 MEMBER ARMIJO: The Subcommittee did not review that. 18 19 MR. AITKEN: No. MEMBER ARMIJO: Is that correct? 20 21 MR. AITKEN: This came up subsequent to the 22 meeting. 23 MEMBER BONACA: Yes. 24 MR. AITKEN: But a response has been 25 provided. **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

MEMBER BONACA: Yes.

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MR. AITKEN: And I think we have an understanding and agreement on the commitment. Okay? I'll move on.

5 The next item relates to a recent concern 6 whether additional components beyond those evaluated 7 in NUREG-6260 need to be evaluated for the effects of 8 the reactor cooling of environment on the cumulative 9 fatigue usage to confirm that NUREG-62060 evaluated 10 limiting for components are the Kewaunee plant 11 configuration.

12 In our response to this item, Dominion committed to perform a review of our design basis ASME 13 14Class 1 component fatigue evaluations to determine 15 whether the NUREG-6260 components that have been effects 16 evaluated for the of reactor coolant 17 environment on the fatigue usage are the most limiting 18 components for Kewaunee. Based on the results of that 19 review, if more limiting locations are identified then 20 Dominion will the most limiting location for the 21 effects of reactor coolant environment on fatique 22 usage prior to the period of extended operation.

23 MEMBER ARMIJO: Could you go back to your 24 Slide 19. You have a point here on resolution, to 25 establish a technical basis, which concludes that the

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41 welds are not required to perform a reactor coolant 1 2 boundary function. I quess pressure Ι don't 3 understand the geometry of your tube-to-tube sheet 4 welds. If they were cracked, how could they not 5 perform that function? MR. AITKEN: Well, the tubes are rolled 6 7 into the tube sheet, and Ι think there's а 8 consideration that that's actually the --9 MEMBER ARMIJO: So, that might -- you might 10 argue that that would provide a seal? 11 MR. AITKEN: Yes, that would be -- yes, 12 that's -- exactly. So, we're working with EPRI, and our NSSS vendor on that. 13 14 MEMBER ARMIJO: Okay. Just to make sure, 15 since the Subcommittee didn't review it. I just didn't understand. Has there been a -- such cracking 16 17 in the U.S. fleet? 18 MR. AITKEN: We're not aware of any. 19 MEMBER ARMIJO: How about the international? 20 21 MR. AITKEN: We weren't provided anv information, but we did discuss that with the Staff. 22 23 And at the time of the discussion, there was no OE 24 presented that this has ever --25 MEMBER ARMIJO: So, maybe -- I'll just **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

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1	withhold that question to the Staff.
2	MR. AITKEN: Maybe something has come to
3	light since our discussions, but to my knowledge,
4	there is no OE. Okay? Can we move on? Okay. Was
5	there any questions on this slide?
6	MEMBER BONACA: Hold on just a second.
7	Okay.
8	MR. AITKEN: Okay. Small-bore piping
9	socket weld inspections. I think you've all talked
10	about that. Mr. Stetkar is laughing. The last item
11	I'll discuss relates to small-bore socket welds. I
12	know this topic has been widely vetted and discussed
13	with the ACRS over the recent past, so I'll cover the
14	highlights here.
15	Kewaunee did not have an open item in our
16	Draft SER related to this topic, but we were recently
17	contacted by the Staff to discuss additional
18	information that would be required to resolve this
19	industry issue.
20	The NRC Staff explained that GALL Rev 2
21	defines an appropriate sample size. For Kewaunee,
22	where we had no ASME Class 1 small-bore socket weld
23	failures, the sample size may be as low as 3 percent
24	of the weld population, or up to a maximum of 10 welds
25	if using volumetric examination techniques. In lieu
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1 of volumetric examinations, the Staff explained that 2 destructive examination could also be used as a method 3 for inspection. In this situation, the Applicant may take 4 5 credit for each weld that is destructively examined equivalent to volumetrically examining 6 being two 7 So, just for your information, Kewaunee has welds. 8 345 socket welds, so, our sample population will be 9 10. 10 MEMBER BONACA: The SER had 5 and 3, 5 and 11 2. And now you're going to 10 and --MR. AITKEN: Yes, we, basically, doubled. 12 So, otherwise -- so, our 13 sample That's correct. 14population will be 10 welds that need to be 15 volumetrically examined if the Nuclear industry 16 endorsed technique becomes available. Otherwise, 17 we'll perform the five destructive exams. We will 18 perform four volumetric exams, or two destructive exams prior to the period of extended operation, with 19 the remaining exams being completed within three years 20 21 of entering the PEO to allow for planning and 22 scheduling of plant resources and outage workload. 23 And this has been provided to the Staff. I'm sure 24 John will be talking about it in his presentation. 25 Any questions on socket welds? **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W.

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44 MEMBER ARMIJO: You had no socket weld 1 2 failures either from fatigue or stress corrosion 3 cracking? 4 MR. AITKEN: That's correct. 5 MEMBER ARMIJO: And you've done visual exams to confirm that? 6 7 MR. AITKEN: Yes. I mean, that's code 8 requirement. 9 MEMBER ARMIJO: Yes. MR. AITKEN: We do our visual exams, so 10 11 So, based on that, and no OE, we -- I think yes. there's different criteria for the socket welds 12 depending on if you've had plant-specific OE. 13 So, in 14the grid, as it was explained to me, we ended up on 15 the 3 percent population. But based on the total number of socket welds we had, we'll max out at 10. 16 17 MEMBER ARMIJO: And your total operating 18 experience on these is the life of the plant, which is 19 what? Where are we now? How many years? 20 MR. AITKEN: About 37 years. MEMBER BONACA: Are the socket welds chosen 21 22 randomly, or do you have a logic behind picking up the 23 10 socket welds to inspect? MR. AITKEN: Well, we haven't got that far 24 25 yet, but I'm sure there would be some intelligence on **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. WASHINGTON, D.C. 20005-3701

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1	risk-significance, and dose considerations, and
2	stagnant locations, and criteria like that.
3	MEMBER ARMIJO: Just one last thing. What
4	is the size range of the socket welds, two inches or
5	less, or one-inch diameter?
6	MR. AITKEN: Less than four inches.
7	MEMBER ARMIJO: Less than four inches.
8	Okay.
9	MR. AITKEN: All right.
10	MEMBER BONACA: Additional questions?
11	MEMBER STETKAR: Yes, I have one. This is
12	just a quick one. There was some discussion during
13	the Subcommittee meeting about aggressive groundwater,
14	and you're going to take core sample from a particular
15	walk. I've forgotten what building it is, and I can't
16	find the building in my notes, but I think you were
17	planning to do that in August. Has that been done?
18	MR. AITKEN: It has been done.
19	MEMBER STETKAR: We had some questions
20	about the depth of the core sample. Did you actually
21	run it fairly deep into the
22	MR. AITKEN: Yes.
23	MEMBER STETKAR: Could you give us there
24	was some discussion about how deep the sample was
25	going to be.
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1	MR. AITKEN: Yes.
2	MR. KASPER: James Kasper, representing the
3	Applicant. In response to that question, we did
4	increase the depth of our sampling into our north wall
5	of our auxiliary building.
6	MEMBER STETKAR: Okay. No results back yet
7	from the sample?
8	MR. KASPER: The results that we have
9	received back from our laboratory, we have not fully
10	completed our review of those results yet.
11	MEMBER STETKAR: Okay. Thank you.
12	MR. AITKEN: That concluded our
13	presentation.
14	MEMBER BONACA: Thank you. Very good and
15	informative. Now, I think we will move to the Staff.
16	MS. GALLOWAY: John Daily, our Senior
17	Project Manager, is going to be presenting the Staff's
18	review information. Participating with him for any
19	questions that might need to be answered are Bill
20	Holston, a Senior Mechanical Engineer in the Division
21	of License Renewal, and Allen Hiser, who is our
22	Senior-Level Staff Member specializing in materials
23	and mechanical issues in the Division. Bo Pham is
24	also here, as well, the Branch Chief. John.
25	MR. DAILY: Which slide presentation is
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our's? I don't want to open the wrong one. Excuse 1 2 me. Good morning. My name is John Daily. 3 I'm the NRC Project Manager for the Kewaunee Power Station 4 5 license renewal review project. We'll be discussing the Staff's review of the Kewaunee license renewal 6 7 application as documented in the Safety Evaluation 8 Report. Melanie has already made the introductions up 9 here, so we'll just continue to the next slide. The outline of today's presentation is 10 11 shown here. First of all, we'll give an overview of the Kewaunee Power Station Safety Evaluation Report, a 12 discussion of the open items and their closure, a 13 14presentation of five supplemental issues of interest 15 to the Staff that arose since the SER with open items 16 was released, and finally then the conclusion. Next 17 slide. 18 The Safety Evaluation Report with open issued on July 16th of this year. 19 items was It contained four open items, which have since been 20 They're listed here, and, of course, we'll 21 closed. discuss each one of them briefly in the upcoming 22 23 And then the Safety Evaluation Report that slides. documents the closing of these items was issued on 24 November 4th, 2010. Next slide. 25

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In addition to the four open items, two 1 questions that were raised by the ACRS Subcommittee 2 3 have been resolved, and looked at in depth with the 4 Staff and the Applicant, and resolved. And three 5 identified and resolved supplemental issues were subsequent to issuing the SER. The two questions that 6 7 we'll be discussing are the Subcommittee concern on 8 small-bore piping commitment, the and then the 9 question that occurred on the compressed air program 10 and certain operational aspects that had come up during the Subcommittee meeting. 11

12 The supplemental items of interest, the first one is the inaccessible low-voltage cables. 13 The 14second is the potential primary water stress cracking 15 corrosion in the steam generator tube-to-tube sheet 16 And, finally, there were some minor issues welds. 17 that were noted in two of the Applicant's Aging 18 Management Programs, the Selective Leaching and the Structures Monitoring Aging Management Programs. 19

I would like to add here, though, that in looking at these supplemental issues it turns out I was a little conservative in identifying these. The first one, the inaccessible low-voltage cables, was able to included in the SER text that's before you today. We're treating it here as a supplemental

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because we did announce it during the Subcommittee, but there was very little detail at that time. Next slide.

4 The first open item related to the use of 5 FatiquePro in the Applicant's metal fatique calculations for the RCS charging line nozzle, and the 6 7 pressurizer hot leg surge line nozzle. Staff noted 8 that the Applicant's Aging Management Program relied 9 on FatiguePro software application, in particular, the stress-based fatigue module to perform certain of 10 11 their calculations, as indicated in the license 12 renewal application, Section B-3.2.

As discussed before, Staff has concerns with using the stress-based fatigue module of FatiguePro in that it does not properly represent all of the tensors in the stress calculation. And we summarized this issue in Regulatory Issue Summary 2008-30.

Dominion 19 agreed to and performed the the 20 confirmed analysis, results of which were 21 submitted to the Staff in June of 2010. As they had 22 discussed, these calculations were performed in accordance with ASME Code Section 3, Subsection NB-320 23 24 on the RCS charging line nozzle, and the pressurizer 25 leg surge line nozzle. They submitted this hot

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50 report, and it was subsequently reviewed by the Staff. 1 2 And it was found to be acceptable in that both of the 3 components showed an environmentally assisted fatigue CUF factor of less than 1.0. 4 5 I believe there was a question that came up during their presentation --6 7 MEMBER ARMIJO: Right. And I just want to 8 -- did it make a significant difference whether they 9 used the FatiquePro or the Staff's preferred 10 methodology? It seems both meet the requirement, but 11 how close was one to the other? That's what I'm 12 trying to get at. Are we doing something useful by making the --13 DR. HISER: This is Allen Hiser with NRC. 14 15 Actually, you said that FatiguePro and the ASME 16 approach give equally valid results. I think what we 17 found was that FatiguePro does not in a stress-based 18 fatigue calculation mode, so the concern that we have is articulated in the Regulatory Issue Summary, is 19 that one should not rely on FatiguePro for design and 20 21 licensing-basis calculations. 22 MEMBER CORRADINI: In this case, though, I 23 think Sam -- all Sam wants to know is in this case 24 when you compared the two, how did they compare? 25 MR. DAILY: I have those numbers.

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MEMBER ARMIJO: If one methodology gave a value of .6, the other methodology is more -- was less conservative and gave a value of .5, what's the big deal?

MEMBER SIEBER: There's about 20 percent difference.

MEMBER ARMIJO: Well, I could see where it could make a difference, but you're very close at one. But I'm just wondering, are we really adding value?

MR. DAILY: First of all, in answer to the 10 11 specifics, which may help the Committee, the charging 12 line nozzle, the previous calculation using FatiquePro, the value was 0.565. 13 In the ASME 14compliant calculation, it was .4636. That's a slight 15 drop, which is, obviously, a little better. In the case of the hot leg nozzle, the value that FatiguePro 16 17 yielded was 0.166. However, in the ASME compliant 18 calculation, the value is .7467. Now, I'm not the Staff expert on this, but as I would look at this, 19 it's a kind of a diverging result, and a good number 20 21 does not, necessarily, mean a good analysis. And 22 that's why I think the Staff had its concerns.

DR. HISER: Now, we did ask an RAI on the source of the differences, and the conclusion that we reached was that different assumptions were made for

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the two nozzles between the two analyses. And the 1 2 the surqe line hot leq nozzle value fact that increased significantly by factors was a concern to 3 4 us, but the fact that it is less than one, and that is 5 really the target that the Applicant had, meant that it is a valid analysis. It doesn't, necessarily, say 6 7 that the FatiguePro value is wrong just because the 8 two values are different, but we do not believe that 9 the FatiguePro calculation has validity overall. 10 MEMBER ARMIJO: So, you never know -- you 11 would say you would never know whether FatiguePro 12 could be wildly off when you're close to one. HISER: Correct. 13 DR. Correct. it But mean, 14doesn't also -- well, again, Ι think the 15 fundamental difference in this case between FatiquePro and the ASME calculations is the assumptions that go 16 17 into the analysis. 18 MEMBER ARMIJO: I understand that part. DR. HISER: And that's --19 MEMBER ARMIJO: I'm just wondering if when 20 21 all is said and done, whether it makes any difference 22 really as far as the expectation of the fatigue life 23 of a component. HISER: We have found in some cases 24 DR. 25 that the values from FatiguePro are lower even using **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

53 the same assumptions, and from that perspective we 1 2 continue to have a concern with the use of FatiquePro. 3 MEMBER SIEBER: What was the RIS number 4 again that you mentioned? 5 DR. HISER: 2008-30. MEMBER SIEBER: Okay, I got it right. 6 7 Thanks. MEMBER ARMIJO: Thank you, Allen. 8 9 MR. DAILY: Now, during this review, the 10 open item itself was expanded, because the Staff also 11 noted that the Applicant used FatiguePro's module, fatigue 12 stress-based module, in evaluating fatique for 13 environmental other locations; two 14 particularly, the pressurizer lower head, and the 15 pressurizer surge line and nozzle. The Staff had concerns with whether these 16 17 analyses submitted in the first case for the hot leg 18 surge line nozzle was, in fact, the bounding analysis 19 for all of the applicable locations for the station, and discussed this concern then with the Applicant on 20 September 30th of this year. 21 By letter dated October 20th, 2010, the 22 23 Applicant supplemented its response on this expanded 24 fatique issue, and basically committed to three 25 things. First of all, to review and insure that its **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. WASHINGTON, D.C. 20005-3701

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ASME Class 1 fatigue evaluations fully bound the issue 1 2 for the plant. In other words, are there other 3 locations beyond the NUREG-6260 that ought to be 4 considered? Secondly, to evaluate the pressurizer 5 lower head and surge line fatigue evaluations per the ASME Code Section 3 NB-3200. And, finally, and this 6 7 may have relevance to the questions earlier discussed, 8 to not use FatiguePro's SPF module in their Aging 9 Management Program. And this, of course, resolved 10 Staff's ongoing concern with whether or not it's a 11 trusted application. Based on its review, and with these further commitments, the Staff finds that the 12 13 disposition of this open item is acceptable, and, 14therefore, closed.

15 DR. HISER: If I could just add one thing 16 about FatiguePro, because FatiguePro is used by many 17 plants, and many plants use it to count cycles. And 18 from that perspective, the Staff has no concerns on the use of FatiquePro. 19 It's when they try to do a stress-based fatigue analysis that the Staff concern 20 21 in the RIS 2008-30 becomes operative. So, if you see 22 FatiquePro in other applications, it isn't, 23 necessarily, -- the of а bad use it isn't, 24 necessarily, concern to the Staff.

MEMBER ARMIJO: But that part of the --

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55 MR. DAILY: That module, the stress-based 2 fatique module --MEMBER ARMIJO: That module is unacceptable 3 because of technical --4 5 MR. DAILY: Issues. MEMBER ARMIJO: -- validity of the models 6 7 used, even though it may yield the same, or close to 8 the same CUF. 9 DR. HISER: That's correct. 10 MEMBER BLEY: But it sounds like -- you 11 said it's missing some of the stress tensors when you 12 started, so if those don't matter, they're probably okay. Do you know that ahead of time? 13 14 MR. DAILY: Our understanding of the module 15 is it picks maybe one, and uses it --MEMBER ARMIJO: Kind of puts them all into 16 17 one. 18 MR. DAILY: -- lumps them together. MEMBER ARMIJO: Lumps them together, yes. 19 DAILY: And because it's a three-20 MR. 21 dimensional field, circular as well as linear, and 22 perhaps entering from the nozzle to another pipe, that 23 just may not be adequate. MEMBER BLEY: Thanks. 24 25 MEMBER SIEBER: The pressurizer lower head **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

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1	is the hottest place in the plant. Right?
2	MR. DAILY: Yes, it is. And particularly
3	around the heater elements.
4	MEMBER SIEBER: And, therefore, if you have
5	a conversion on the plant, that's where the largest
6	temperature change is going to occur.
7	MR. DAILY: Probably true, yes.
8	MEMBER SIEBER: Okay. So, all this takes
9	that into account. That's the highest stressed area
10	as I see it, from a thermal stress standpoint.
11	DR. HISER: It should take all of those
12	stresses, all the change in stresses into account,
13	temperatures, et cetera.
14	MEMBER SIEBER: Right. And that's INCONEL
15	600?
16	DR. HISER: Likely, yes.
17	MEMBER SIEBER: And beyond the 610 degrees
18	that sticks in my head is the transition point.
19	MR. DAILY: Typically, 620 plus when you
20	get to operating pressures.
21	MEMBER SIEBER: Yes, up in the 625, 630.
22	MR. DAILY: Somewhere in there for the
23	operating pressures.
24	MEMBER SIEBER: Okay. So, that becomes the
25	most sensitive place in the plant for cracking.
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57 DR. HISER: It can be. Now, I'm not sure 1 the specific location on the lower head that it's 2 3 limiting. I'm not aware of whether it's Alloy 600, or 4 stainless, or carbon. 5 MEMBER SIEBER: Another one is the charging That's where you have big temperature --6 line. MR. DAILY: Right. The surge line, itself, 7 8 can, of course, undergo transients during heat ups and 9 cool downs when you've got pressurizer in surge and 10 out surge, maybe slow, maybe rapid. 11 MEMBER SIEBER: Well, typically, it's slow 12 MR. DAILY: Right. And the charging line 13 14 nozzle could experience with letdown and isolation ---15 MEMBER SIEBER: That's on and off, big 16 17 swings. 18 MR. DAILY: Yes, sir. That's correct. it's 19 MEMBER SIEBER: But below the temperature that I'm sensitive to, which is 610 to 615 20 21 per INCONEL. MR. DAILY: It should be below that. 22 ABDEL-KHALIK: 23 CHAIRMAN the Does 24 pressurizer lower head undergo sort of cyclic 25 temperature variations when the pressurizer heaters go **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

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1	on and off?
2	DR. HISER: It undergoes thermal cycles.
3	CHAIRMAN ABDEL-KHALIK: And how do you keep
4	track of that?
5	MR. DAILY: That might be something to ask
6	the Applicant, if they're monitoring that. But I
7	would just say from my understanding of the operation,
8	those temperatures at that area typically are close to
9	the saturation temperature for the pressure you're at;
10	and, therefore, I'm not sure how much of a Delta T
11	there would be between right at the heater versus the
12	rest of the bottom head. There may be people that are
13	more knowledgeable than I am.
14	MR. HOTCHKISS: This is Marc Hotchkiss for
15	Dominion. John is correct. The heater on/heater off
16	situation wouldn't be a significant thermal transient.
17	The transients of concern would be more plant heat
18	up/plant cool down, which are much larger range of
19	temperature change.
20	CHAIRMAN ABDEL-KHALIK: But the operative
21	word there is "significant." How do you determine
22	whether or not they are significant?
23	MR. HOTCHKISS: Well, an analysis could be
24	done on a heater on/heater off to determine its
25	significance to fatigue usage, but I think by
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1	inspection, and by experience of the analyst, that
2	would typically be considered insignificant. It's a
3	very small temperature range, total temperature change
4	for the material. We're more concerned with the large
5	100 degree an hour, or larger temperature change.
6	MEMBER ARMIJO: But it could be more
7	frequent.
8	MR. HOTCHKISS: It could be more frequent,
9	but it's so small that even millions of cycles would
10	not be significant for the fatigue usage.
11	MEMBER ARMIJO: Below some endurance limit,
12	or something.
13	MEMBER SIEBER: Some heaters are on all the
14	time, and there will be a small portion of
15	MEMBER STETKAR: You typically have a
16	couple of banks of heaters on fully, and you cycle a
17	third or fourth
18	MEMBER SIEBER: You've got to make up for -
19	_
20	MR. DAILY: Well, at a well-operated plant
21	the continuous heaters would be on a little bit of
22	spray flow in the backup would not cycle at all,
23	unless you had a larger transient greater than, I
24	don't know
25	MEMBER STETKAR: Right. Let down flow
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1	control problems, or something.
2	MR. DAILY: Right. So, perhaps that helps
3	with the next slide.
4	The third open item involves the
5	Applicant's Aging Management Programs for buried and
6	underground piping and tanks. In light of recent
7	industry events do we have the right one? Did I
8	skip one? I'm sorry, let's back up. Let's back up to
9	Open Item 2.
10	The second open item identifies concerns
11	that were related to primary water stress cracking
12	corrosion potential in nickel alloy steam generator
13	divider plate assemblies.
14	The Staff noted that recent foreign
15	operating experience in recirculating steam generators
16	with a similar design to Kewaunee's has identified
17	noticeable cracking due to PWSCC in the upper portion
18	of the divider plate assemblies; in particular, up in
19	the stub-runner and divider plate region at the top of
20	the divider plate. Therefore, the Staff was concerned
21	as to whether Applicant's program addresses this
22	potential in managing aging effects of cracking due to
23	PWSCC in the divider plate.
24	In response to the Staff's questions, the
25	Applicant stated and committed to certain items.
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61 First of all, it stated that its divider plate 1 assemblies are Alloy 600 in terms of the plate and the 2 3 stub-runner, and the associated welds are Alloy 52/152 4 material, which relates more to the Alloy 690, I 5 believe. Then the Applicant also committed to perform an inspection of each steam generator divider plate 6 7 prior to the 10-year end of POE period in order to 8 detect whether such cracks are occurring in the 9 divider plate assemblies. the divider plate 10 MEMBER ARMIJO: Was 11 thermally treated in the Kewaunee --MR. DAILY: During its fabrication? 12 MEMBER ARMIJO: Yes, to try to improve its 13 14 PWSCC resistance. I thought that was a -- maybe the 15 Applicant knows. Since it's a newer --MR. DAILY: I would expect that it was, but 16 17 they can --18 Yes, MEMBER ARMIJO: the newer steam 19 generators --MR. DAILY: -- provide more specific --20 MEMBER ARMIJO: Yes. Was the divider plate 21 22 thermally treated, Alloy 600TT, or not? 23 DR. HISER: But I think the thermal 24 treatment that's done, for example, the tubes has not 25 prevented cracking in --**NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. (202) 234-4433 WASHINGTON, D.C. 20005-3701 www.nealrgross.com

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1	MEMBER ARMIJO: I know it hasn't. Was it -
2	_
3	dR. HISER: But it will
4	MEMBER ARMIJO: Was believed to increase
5	its resistance.
6	DR. HISER: That's correct.
7	MEMBER ARMIJO: But it wasn't totally
8	effective.
9	DR. HISER: Right.
10	MEMBER ARMIJO: So, we don't know. Okay.
11	No need to follow-up.
12	MR. DAILY: I wanted to point out that the
13	inspections being performed prior to about midway in
14	the period of extended operation will be somewhere of
15	an operational lifetime, approximately 20 years on
16	this portion of the steam generators, which, as the
17	Applicant stated, had undergone steam generator
18	replacement in 2001. So, at approximately 2020 to 23
19	is the year time frame that the expectation that
20	age point is selected because it should replicate if
21	they are there, it should replicate the experience
22	that was experienced with these other steam generators
23	in Europe.
24	And then, finally, the Applicant stated
25	that it will remain actively involved in the new EPRI
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steam generator management program activities that were, we understand, undertaken beginning this summer in order to study and resolve this issue. So, they're going to remain actively involved with that. Next slide.

The third item involves the 6 open 7 Applicant's Aging Management Programs for buried and 8 underground piping and tanks. In light of recent 9 industry events involving leakage from buried and underground piping and tanks, the Staff had concerns 10 11 concerning contingent susceptibility to failure of elements in this area, buried or underground piping 12 within the scope of license renewal. And in response 13 14to the Staff's concerns and questions, the Applicant 15 made the following commitments.

First of all, that it would maintain its 16 17 cathodic protection system greater than -- 90 percent 18 or greater available during the period of extended operation for in-scope piping and tanks. 19 Secondly, 20 conducting the annual NACE surveys for these 21 components. Third, that it would enhance its Aging 22 Management Program to visually inspect representative 23 samples of each material/protected measure combination 24 for the in-scope buried and underground piping and 25 These inspections would take place prior to tanks.

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PEO, during the first 10 years, and then during the second 10 years of the period of extended operation.

3 The fourth open item identified some the 4 issues in Applicant's Work Control Process 5 Program. As you'll recall, the Applicant amended its Control Process Program in the 6 Work license 7 application in September of 2009, and identified it 8 a new Aging Management Program that when now as 9 enhanced would be consistent in appropriate portions 10 with program elements of the one-time inspection, and 11 of the inspection of internal surfaces, and 12 miscellaneous piping and ducts.

The Staff noted in this area a number of 13 14issues in the newly submitted program, primarily in 15 the characterization of sample sets, and whether there was assurance of the adequacy of the depth and the 16 17 breadth of the program in its inspection activities. 18 These were the ones that were most important out of a myriad of issues that were related. And in response 19 Applicant committed 20 those concerns, the to to enhancing its program with the following. 21

First of all, they will be completely specifying minimum percentages, sample sizes, and inspection frequencies for each of the component material populations. They'll be performing audits of

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their periodic preventive maintenance and surveillance 1 2 activities in order to confirm that the material 3 environment combinations, in fact, have been 4 inspected. If they notice any delta, then they will 5 take care of that, and do those inspections. And then, finally, these audits will occur 6 7 prior to PEO, and again inside of each of the 10-year 8 periods of the period of extended operation. So, these 9 items were acceptable then to the Staff, and the Staff

10 closed this open item.

11 MEMBER STETKAR: And the Staff will audit 12 the bases for those whatever sample program as part of 13 your inspection activities? How does the Staff gain 14 assurance that the sample sizes and the process for 15 identifying those samples are adequate?

MR. DAILY: We may want the Staff to -- but one of the methods that we have of confirming this is with our 71003 inspections. And that -- we think that that and the Resident Inspectors, that that should resolve that.

MEMBER STETKAR: Okay. Thanks.

22 MR. MEDOFF: Hi, this is Jim Medoff with 23 the Staff. I was the reviewer for the Work Control 24 Process. The issues were that the program is defined 25 as a sampling-based program, and it's used for a

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1	number of component material environment combinations,
2	and various aging effects in those combinations. The
3	SRP is very clear about in Appendix A, which is the
4	Branch Position in the SRP, it's very clear about what
5	they what we expect for an Applicant to do when
6	they're using such a sampling-based condition
7	monitoring program. So, we wanted them to define
8	exactly which, if they had a population of components
9	for a given material environment combination, we
10	wanted them to define what that population was, and
11	then tell us what the sample would be consistent with
12	the SRP methodology. So, the open items really dealt
13	with making sure that they were conforming to the SRP
14	criteria for the condition monitoring program.
15	MEMBER STETKAR: Thank you.
16	MR. DAILY: Next slide. Getting now to the
17	questions that had arisen during the ACRS Subcommittee
18	meeting in August. The first Subcommittee item
19	involves revisions and concerns to the commitment
20	regarding the small-bore piping inspections. The ACRS
21	Subcommittee had expressed a concern as to whether the
22	proper quantity of small-bore socket welds would be
23	destructively tested under the Applicant's commitment,
24	as stated, in the SER with open items. At that time,

25 it appeared to the Subcommittee that only one non-

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destructive, or one destructive examination would have been performed.

The Staff reopened this issue then in discussions with the Applicant, and explored it more in depth, and notes that according to the Applicant's latest count, the station, itself, has no history of failures for approximately 345 small-bore welds, as they had mentioned in their own presentation over approximately 35 years of plant history.

10 resolved then by The issue was the 11 Applicant committing to using NDE methods and/or 12 destructive examinations in accordance with, basically, time frames and quantities as shown here in 13 14the table. Prior to the period of extending 15 operations, they will perform a combination of either 16 four NDE exams, or two destructive examinations within 17 the period of PEO up to three years thereafter, so for 18 about a six-year period, because they're only about 19 three years away from PEO. They will complete it with six more NDE or three destructive examinations. 20 And this combination and time frame fell in line with the 21 22 Staff's current expectations of a plant with no 23 history of failures doing an NDE of approximately 3 24 percent, maximum of 10, or one-half of that if the 25 destructive examinations. Because, of course, those

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yield more information.

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2 MEMBER ARMIJO: I just wonder whether we are just overdoing it with this extensive operating 3 4 experience, and so many welds for so many years, 5 whether that's a right requirement. I think at the Subcommittee -- there was discussion about, the Staff 6 7 had a logic that it was using on a case-by-case basis. 8 It wasn't clear, exactly, how you were doing it. And 9 you did put together a more explicit table. But the answer comes out do a destructive examination with the 10 11 expectation is a pretty low probability that you're 12 going to have something there. So, I wanted to ask where people have done destructive examinations, have 13 14they found anything other than, let's say, a fatigue 15 crack which was -- what do you expect to find? DR. HISER: Plants have found cracks, some 16

of the findings have been follow-up destructive exams to NDE, where they had indications from the NDE that there were indication -- that there were flaws in the welds. They were removed, destructively examined, and I believe in one case stress corrosion cracking was found, in other cases other types of cracking had been identified.

24 MEMBER ARMIJO: The question I have is, if 25 you find, let's say in socket weld some little crevice

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69 region, a stress corrosion crack, you really don't 1 2 if it's been there from the beginning, know and stopped growing, or whether it's been growing or 3 4 initiated later in life. I just don't know where 5 we're going with this thing, other than we're doing it just for general principles. It's a good idea to 6 7 inspect, but I just think the destructive is a pretty 8 expensive and time-consuming exercise, when you don't 9 have any experience --10 dR. HISER: I don't think that we would 11 disagree with that. And we would rather see nondestructive examinations. 12 MEMBER ARMIJO: But there is no acceptable 13 14 volumetric NDE method yet. 15 DR. HISER: Some plants have NDE methods 16 that they are applying. EPRI is developing for the 17 industry a broader scoped NDE method. 18 MEMBER ARMIJO: Okay. 19 DR. HISER: One plant, in particular, developed an approach specific to their geometry. 20 EPRI is looking to expand that to different geometries 21 22 that would serve the industry. The concern that we have here is that the history at Kewaunee indicates no 23 failures from socket weld degradation. We don't know 24 25 if there is cracking that is occurring at Kewaunee **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS

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that has not progressed to failure. Within license renewal, we were looking at aging management detecting aging effects. The purpose of these examinations is to verify that water chemistry and other approaches taken by the Applicant do, indeed, prevent degradation of socket welds. Clearly, if a plant has had socket weld failures, then the number of inspections increases quite a bit.

9 for The change Kewaunee is that we 10 believed that the prior commitment that they had to do 11 examinations represented a 3 percent sample. We subsequently found out that the sample population at 12 13 Kewaunee was double what we thought that it was, and 14 we believed that they needed to increase the number of 15 welds that they examined.

MEMBER ARMIJO: Where did the 3 percent come from, Allen?

DR. HISER: It came from -- it actually came from Kewaunee. We thought Kewaunee was at 3 percent, and as we were --

21 MEMBER ARMIJO: They thought they were at 3 22 percent until they discovered this other population, 23 or what?

DR. HISER: They had specified a number of inspections that they were going to do. We believed

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the population at that point was on the order of 170 welds. To us, that represented about a 3 percent sample. When we came to appreciate that their sample was twice as large, we believed that the 3 percent was still a reasonable distribution of examinations to provide some reasonable assurance that there is no degradation --

MEMBER ARMIJO: Okay. And you would accept NDE, even if it isn't perfect volumetric inspection.

10 DR. HISER: The way that we have stated 11 that we believe the NDE should be conducted, is that it's demonstrated capable of detecting degradation of 12 So, a lot of the qualification and things 13 interest. 14like that relate to sizing, depth sizing and length 15 sizing of flaws. We don't think that in this case that it's necessary. This is sort of a go/no-go test. 16 17 MEMBER ARMIJO: Okay.

DR. HISER: Is what we think is the minimumthat would be necessary.

MEMBER ARMIJO: Okay. Thank you.

The 21 MR. DAILY: Next slide. second 22 question that arose during the Subcommittee meeting which we'll discuss here in Item 2. 23 ACRS had a concern as to whether the downstream instrument air 24 25 might be adversely affected by, lines in the

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Compressed Air Program, by an automatic instrument air 1 2 dryer bypass on high- DP alarm. The Applicant 3 provided, subsequently to the August meeting, some 4 clarifying information. Basically, it follows this 5 line of actions and responses. The alarm would sound in the main control room, and, of course, the control 6 7 room operator would acknowledge. At the local station 8 automatically the instrument air dryer bypass line 9 does open, but the operator response is to respond using established procedures, and to swap out the 10 11 dryer air filter combinations into another combination that would maintain the downstream air quality. 12 And this manner, of course, maintaining instrument 13 air 14pressure, and yet minimizing the exposure to any 15 unfiltered air that might propagate downstream.

16 The time for this total response, 17 according to the Applicant, is typically the order 18 less than 45 minutes. So, the Staff felt that this information was acceptable to demonstrate that any 19 effects that might happen to the downstream piping 20 would be minimal in this case. 21

22 MEMBER STETKAR: John, the question, 23 actually, didn't arise about the time for swap-over. 24 The question arose because the Applicant had excluded 25 explicitly one of their three air dryers in the scope

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of license renewal. And they said that Air Dryers 1A and 1C were in scope, but Air Dryer 1B was excluded from the scope of license renewal; their argument being that 1B, apparently, is isolated during some type of Appendix R response.

The discussion in the Subcommittee came up 6 7 that if, indeed, Air Dryer 1B is actually in service 8 during normal plant operation for а reasonable 9 fraction of the time, that being the time that 1A or 10 1C is not in service, then why doesn't the quality of 11 Air Dryer 1B contribute to the overall quality of the 12 instrument air system? So, it wasn't a question regarding the amount of time for transfer, it was a 13 14question of the justification for excluding that 15 particular air dryer from the scope of license 16 Recognizing that, indeed, some fraction of renewal. 17 the time when the plant is normally operating, that 18 air dryer will be in service, regardless of whatever administrative controls may or may not be applied to 19 it under some Appendix R fire scenario analysis. 20 So, 21 the question really was what fraction of time will 22 that air dryer be in service controlling air quality 23 during normal plant in the system operation; 24 recognizing that it is, apparently, nominally the one 25 that is in standby, and would be placed in service if

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1	one of the normally operating air dryers required
2	maintenance, or repairs, or something like that.
3	MR. DAILY: We didn't really I don't
4	think we got any information on that, on the 1B air
5	dryer.
6	MEMBER STETKAR: In the interest of time
7	here, I think you probably
8	MR. DAILY: We can get that
9	MEMBER STETKAR: I just wanted to make sure
10	that point was clarified, that, apparently
11	MS. GALLOWAY: Is that something, perhaps,
12	the Applicant could answer briefly at this time?
13	MEMBER STETKAR: Well, we had asked them
14	that. They didn't have the information. I don't know
15	if they have it available today about one of the
16	questions I asked is what fraction of time
17	historically has that 1B dryer actually been in
18	service during plant power operation.
19	MR. ZIPP: William Zipp from the Applicant.
20	The what you're stating is correct. The Charlie,
21	the C dryer is the normally operating dryer, and the A
22	and B, Alpha and Bravo driers are backup driers, so
23	they're normally not in service, which would be used
24	if there's a problem with our normal dryer, or like
25	you said, an Appendix R scenario, we would use the
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Alpha drier.

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2	When the dryer bypass occurs, it's
3	enunciated in the control room on the sequence event
4	recorders. A system engineer went back through plant
5	history on that recorder, found very few instances of
6	an enunciation. We also interviewed operators and
7	engineers, and the amount of time that our normally
8	operated Charlie dryer is out of service is very
9	small, very few instances where anybody could recall
10	running on the backup dryers.

MEMBER STETKAR: Okay. Well, thank you. That helps, that helps a lot. Thank you.

> MR. DAILY: That's great. Thank you. MEMBER BONACA: We need to move on.

15 MR. Supplemental DAILY: Issue One, subsequent to the issuance of the SER with open items, 16 17 and, more particularly, the SER, itself in November, 18 the Staff was performing a completeness assessment of 19 the license renewal reviews currently in progress. 20 The following issues were identified as a result for 21 the Kewaunee application, and these resolutions will 22 final published be incorporated into the SER, subsequent, of course, to ACRS concurrence on the 23 issues. 24

But the first one that we have to discuss

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76 is the matter of the inaccessible low-voltage 1 2 electrical cables. It turns out that, as I mentioned 3 before, we actually were able to get this one into the SER published 4 in November. We left it as а 5 supplemental, because, again, it wasn't really discussed at length during the Subcommittee meeting. 6 7 And the concern followed operating experience that 8 licensees had submitted in response to Generic Letter 9 2007-1, which indicated that -- this OE indicated that some non-EQ 480 to 2000-volt AC inaccessible cables 10 11 have suffered failures, and that there was а relationship to water degradation and/or submergence. 12 13 In response to the issue, the Applicant 14 has stated that the station had not experienced any 15 failures of these cables as reviewed from its Generic Letter response, and that none had happened since that 16 17 The low-voltage cables, themselves, would be review. added to the Aging Management Program. As a result of 18 this, some new cables and two more manholes were added 19 as a result. And I believe the pooling pit, which was 20 21 submitted as a part of their August annual update, was also identified at this time. 22 inspections of these manholes The and

The inspections of these manholes and pooling pit showed only minimal water, and no real evidence of any submergence or wet cables. The

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Applicant stated that they would perform manhole 1 2 inspections prior to PEO, and based upon plant 3 experience, at least every two years. And the testing 4 of the cables would be done again prior to the period 5 of extended operation based on plant experience, but at least every 10 years. And the Staff found that due 6 7 to them not having any failures to speak of, and that 8 the additions of these cables into the program with 9 this inspection and testing routine, that this would 10 be acceptable to resolve the Staff's concerns.

11 MEMBER STETKAR: John, as we're running short on time, so we really don't have time to discuss 12 it, but the question that I asked the Applicant about 13 some specific 480-volt cables didn't leave me with 14 15 high confidence that, indeed, they could inspect those particular cable runs for accumulation of water. 16 Is 17 the Staff aware of that configuration, and is that 18 acceptable to the Staff, that those particular cable runs, if that's true that they can't be inspected for 19 water accumulation? You don't, necessarily, need to 20 21 answer it unless you've actually looked at it. It's a 22 bit of a rhetorical question, but --

23 MR. DAILY: And our staff member, Cliff 24 Doutt, may shed some light on the inspections that he 25 and the regional team did, as well as the others on

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these new cable runs.

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2 MR. DOUTT: Specific to that counter run, 3 it doesn't have access, but we looked at the manhole 4 at the time of the in-scope when we were there, there 5 was a single manhole. We didn't inspect that one. Prior to that, switch or modification were added, the 6 7 pooling pit into scope, as well. That was modified as 8 a manhole. The region looked at that one. There was There's no history of water 9 no water in that one. 10 intrusion or submergence of cables, on site water 11 tables are relatively low. If you look at the AMP, 12 GALL AMP itself, there's a couple of combinations. One, you'd like to look at a manhole to get an idea if 13 14you do have a problem. That should be the low point 15 in the drain point, and get an idea. However, it also 16 says that if you find that -- you drain that, there's 17 still a possibility that you have low points in the 18 counter runs that may, in fact, still have water in So, the option there is to test. 19 them. So, in this particular case what we're doing is testing. 20 Since 21 there isn't any particular history, we'll do it in 10 22 If, in fact, a problem is found before period years. 23 of extended operation, that testing could increase, or other action be taken. So, that's basically the idea 24 25 of how we looked at it.

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1	MEMBER STETKAR: Okay. Thank you.
2	MR. DOUTT: Sure.
3	MR. DAILY: Thank you. That was Cliff
4	Doutt of the NRC Staff.
5	Supplemental Issue Two involved the steam
6	generator tube-to-tube sheet welds, and a potential
7	for PWSCC in that region. For nickel alloy cladding,
8	if one of them might be 600 and the other one may or
9	may not be Alloy 690, the concern is in the tube-to-
10	tube sheet region, the autogenous weld that is
11	developed during fabrication may not have sufficient
12	PWSCC resistance; and, therefore, the Staff identified
13	a concern.
14	Now, this concern has arisen historically
15	in relationship to other steam generators, but in
16	looking at the chemistry, and the mechanics involved,
17	the Staff felt that it also would apply to
18	recirculating steam generators. That's the kind of
19	the new point here. And in response to the Staff's
20	concerns, the Applicant committed to a plan, as they
21	had described, which basically consists of exercising
22	one of two options. The first option would be to
23	perform an analytical evaluation establishing a
24	technical basis, and perhaps that it's not even
25	necessary for the reactor coolant pressure boundary

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integrity. The second option would be to perform onetime inspections of a representative number of welds in each steam generator. If, as a result of those inspections, cracking is identified, of course, that would be evaluated and repaired, and they would then institute an Aging Management inspection routine for the remaining life of the steam generators.

8 MEMBER ARMIJO: If this is a relatively new 9 steam generator, and I'm just wondering if Alloy 690 preferred material with the best 10 is the PWSCC 11 resistance, was there -- maybe it's a question to the -- would the Staff had -- they had 690, would the 12 Staff be requiring the same inspection of 690 cladding 13 14on the tube sheet?

MR. DAILY: Cladding, because right nowthey have 690 tubes, and 600 cladding.

MEMBER ARMIJO: Yes.

DR. HISER: The concern we have is with 18 If the cladding is 690 type of 19 chromium content. cladding, then we would not have the concern. 20 In 21 addition, with the autogenous welds between the Alloy 22 600 cladding and the 690 tubing, the -- our concern 23 would be that the chromium content, it's likely would 24 be between the two levels, is that sufficient to make 25 it more resistant to PWSCC? We have not heard an

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argument that that is the case.

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MEMBER ARMIJO: Okay. And this is just -but this isn't based on actual failures at this 600 to 690 type --

5 dR. HISER: No, there's no specific operating experience. I'm not aware, again, that 6 7 people have done a lot of examinations in this area to 8 verify that there are no cracks. And this is, as John 9 mentioned, it's really an Aging Management line item 10 within the GALL Report that requires some disposition. 11 In the case of a disposition using water chemistry, for example, then a one-time verification inspection 12 is adequate to insure integrity in that area. 13 the welds you're 14MEMBER SIEBER: Now, 15 talking about are in the channel head.

DR. HISER: They are --

MR. DAILY: They're actually at the base ofthe tube sheet in the channel head area.

19 MEMBER SIEBER: In the channel head. Tube 22 inches full rolled, 20 sheet is SO structural 21 integrity is not an issue. It's actual corrosion of 22 under the plant of the tube sheet that gets up through the crack where the weld is defective. That's what 23 24 you're talking about. Right?

DR. HISER: Well, the concern actually

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82 The weld serves for structural relates to both. 1 2 integrity and a leak tight integrity. And both concerns are --3 4 MEMBER SIEBER: Probably 2-inch rolled 5 satisfies the -- I'm not sure if it's a full-depth I think a lot of people, even in the early 6 roll. 7 days, went back, and if they didn't have a full-depth 8 full-depth roll roll, they made а to avoid 9 infiltration from the secondary side down that crack. I know we did it with explosive --10 11 dR. HISER: Yes, the analysis that's indicated in the second to the bottom bullet there is 12 something that's used quite a bit in the PWR industry, 13 14 they're called STAR amendments, C-STAR, F-STAR, et 15 And they're calculational approaches that cetera. 16 demonstrate that the bottom --17 MEMBER SIEBER: Avoid the --18 MR. DAILY: To avoid the issue, basically. MEMBER SIEBER: Right. 19 MR. DAILY: Because you have adequate means 20 21 to -- for the boundary, and for structural integrity. 22 MEMBER SIEBER: Right. 23 MR. DAILY: Right now, our understanding is 24 that the Applicant doesn't have that on record. 25 That's what that bullet might lead to. **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W.

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1	MEMBER SIEBER: My only concern is that
2	that's a high-REM job, because the tools you use can't
3	get into the corners, can't get next to the divider
4	plate very well. I wouldn't want to, unnecessarily
5	
6	MEMBER ARMIJO: Take lot of dose from that.
7	MEMBER SIEBER: There is a lot of dose
8	involved.
9	MR. DAILY: I think maybe in the 3000
10	nominal tubes, though, of course, they should be able
11	to get a representative without having to
12	(Simultaneous speech.)
13	MEMBER SHACK: When I see these bullets, I
14	see it in the SER and here, it would read better if
15	you said even when tubes are Alloy 690.
16	MEMBER ARMIJO: Yes, it almost sounds like
17	690 was the kiss of death.
18	MEMBER SHACK: 690 is not causing the
19	problem.
20	MR. DAILY: No, 690 is not. There's a
21	dilution concern, as Allen was talking about.
22	MEMBER SIEBER: Well, we don't know yet.
23	MR. DAILY: We don't know.
24	MEMBER SIEBER: 600 was perfect 50 years
25	ago when I first started. And then all of a sudden,
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it became imperfect.

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MR. DAILY: Okay. Next slide, please. 2 The 3 final supplemental issue to raise really is -- I'm not 4 going to say it's unimportant, because the details are 5 important. However, there were some things out of the completeness review in relation of the 6 to two 7 Applicant's Aging Management Programs, where Staff was 8 really convinced that adequate quantitative not 9 details had been supplied. So, I summarized them here 10 slide involving the selective on this leaching 11 program, where the Applicant has agreed to revise its 12 include specific information, program to again, looking at sampling methodology regarding how they 13 14selected components, how the sample size is going to 15 be determined, and really quantifying that into more 16 specifics.

17 In the case of the Structures Monitoring 18 Program Aging Management, the Applicant has clarified 19 that inspection intervals for masonry walls is, in fact, at least every five years. We weren't sure what 20 21 that frequency really was. They clarified that the 22 inspection interval for in-scope accessible structures 23 was at least every five years. And, finally, the 24 Applicant agreed to amend its program in order to 25 include more quantitative acceptance criteria in

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1	accordance with things, such as American Concrete
2	Institute Document 349.3R for their Structure
3	Monitoring Inspections. These responses then, and
4	these clarifications will be incorporated into the
5	final published Safety Evaluation Report. Next slide.
6	In conclusion, on the basis of its review,
7	and with the commitments and items noted, the Staff
8	determines that Dominion Energy Kewaunee, Incorporated
9	has met the requirements of 10 CFR 54.29(a) for the
10	license renewal of the Kewaunee Power Station. This
11	completes our presentation to the Committee. Thank
12	you for your time. And if there's any questions?
13	MEMBER BONACA: If there are no additional
14	questions, we have a member of the public that would
15	like to make a statement on the line, Mr. Leyse. Are
16	you on the line?
17	CHAIRMAN ABDEL-KHALIK: Perhaps at this
18	time we can open the line to allow Mr. Leyse to
19	address the Committee.
20	MEMBER BONACA: Mr. Leyse, are you on the
21	line?
22	MEMBER CORRADINI: Is the line open?
23	MR. DAILY: There are some other members
24	that might speak up, and say the line is open.
25	MEMBER STETKAR: Is there anyone out there?
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1	MR. LEYSE: Well, you've used my five
2	minutes. I guess you hear me.
3	MEMBER STETKAR: Yes.
4	MR. LEYSE: Okay. I'll get going.
5	MEMBER BONACA: Okay.
6	MR. LEYSE: I'm Bob Leyse. This
7	presentation is directed to two petitions for
8	rulemaking that were originated by Mark Leyse. These
9	are PRM-50-93 and PRM-50-95. And today I'm standing
10	in for Mark. I'll move through the seven-page handout
11	in the allotted five minutes.
12	Moving to page one of the handout, NRC
13	should not authorize plant license renewal, or power
14	uprates prior to its resolution of PRM-50-93, and PRM-
15	50-95. A 2,200 degree Fahrenheit PCT limit is too
16	high. The 2,200 PCT limit is based on embrittlement
17	criteria. The Baker-Just equation was placed into
18	50.46, and it has been convenient in licensing. Its
19	current use in 50.46 is fiercely defended by the NRC.
20	Not in the handout is an incorrect remark
21	by Bajorek at the joint meeting of three ACRS
22	Subcommittees on May 31 st , 2002. I quote, "Note, by
23	the way, Baker-Just and some of the earlier data was
24	based on zirconium data only." In fact, Baker-Just is
25	very predominantly based on experiments with Zircaloy
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2 at Bettis and Batelle. NRC did not even have those references until I appealed to the OGC, and then the documents were acquired and placed in Adams. The reports are WAPD-104, Adams Accession ML100900446, and BMI-1154, Adams Accession ML100570218.

Go to page 2. At another point in that 6 7 joint meeting of the three ACRS Subcommittee meetings 8 on May 31st, 2002, we hear from Member Wallis, "2,200 9 is very iffy basis. The only justification really is that it has worked over 30 or 40 years." 10 However, 11 Member Wallis is wrong. There is nothing iffy about 2,200. Very clearly, 2,200 is too high, and there is 12 13 nothing iffy about that.

14 Perhaps the most impressive evidence comes 15 from experiment LOFT LP-FP-2, where thermal runaway of 16 the fuel bundle was initiated in the 2,060 to 2,240 17 degree Fahrenheit range. And the series of CORA 18 experiments at Karlsruhe yielded thermal runaway over a range from about 1,800 to 2,200 degrees Fahrenheit. 19 The CORA experiments used bundles of electrically 20 21 heated rods having zirconium alloy cladding, and 22 uranium dioxide fuel pellets.

On page 3 of the handout, note that Mark Leyse and Robert Leyse jointly made a 10-minute presentation to the ACRS Thermal Hydraulics Phenomena

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Subcommittee meeting on Monday, October 18th, 2010. Close to the end of the meeting, the Subcommittee briefly discussed the matter.

To save time, please skip to page 6. 4 5 Discussing the review of PRM-50-93 and PRM-50-95 at the October 18th meeting, we hear from Member Abdel-6 7 Khalik, "And I think from the Committee's perspective 8 we await the Staff's evaluation and we will review the 9 Staff's evaluation." Now, one primary mandate of the ACRS is, "To initiate reviews of specific generic 10 11 matters or nuclear facility safety-related items."

In line with that mandate, I believe that 12 should evaluate PRM-50-93 and PRM-50-95 13 ACRS in 14parallel, and likely in advance of the NRC's technical 15 evaluations. For emphasis, I am repeating from page 1, NRC should not authorize plant license renewals, or 16 17 power uprates prior to its resolution of PRM-50-93 and 18 PRM-50-95. Thank you.

19 MEMBER BONACA: Thank you. Any questions 20 for Mr. Leyse? There are no questions, but we will 21 take into consideration the statement. We will 22 discuss this report tomorrow.

23 MR. LEYSE: Do you know about what time 24 roughly? That's okay. Thank you, again.

MEMBER BONACA: Okay. Thank you. With

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1	that, I turn it over to you, Mr. Chairman.
2	CHAIRMAN ABDEL-KHALIK: Thank you. At this
3	time, our schedule calls for us to take a break. We
4	will take a break until 10:30.
5	(Whereupon, the proceedings went off the
6	record at 10:17:16 a.m., and went back on the record
7	at 10:31:39 a.m.)
8	CHAIRMAN ABDEL-KHALIK: We're back on the
9	record. At this time, we will move to Item 3 on the
10	agenda, Final Safety Evaluation Report associated with
11	the amendment to the AP1000 Design Control Document,
12	and Harold Ray will lead us through that discussion.
13	MEMBER RAY: Thank you, Mr. Chairman. We
14	also have passed out a more fine-grained agenda for
15	this portion of the meeting that will last the rest of
16	the day, and we'll be following the item numbers that
17	are shown on that agenda. We begin in open session.
18	We will go then to closed session, and then end the
19	day in open session. Again, at the latter part, that
20	is during the end of the day open session, we have
21	received a request and will honor a request for public
22	comment over our phone line. I don't believe there
23	has been any request by anyone present here in the
24	room to make public comment.
25	This is, as the Chairman said, the
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90 amendment to the design certification application. Ιt 1 2 does include GSI-191, but we will, ultimately, have a 3 letter on the amendment except for GSI-191, and then a 4 separate letter in parallel, and hopefully 5 concurrently on GSI-191. That leaves aircraft impact as not included in the discussion today, or in either 6 7 of these letters that we contemplate having the Full 8 Committee consider. And I want to underscore that, 9 because we will be talking about some things where it 10 would reasonably expected that be we would be 11 including aircraft impact considerations, but those will be taken up in due course, and hopefully brought 12 to the Full Committee meeting now scheduled 13 in 14 January. 15 With that, let me turn -- I understand Mr. 16 Holahan would like to make a comment. If you'd please 17 do that, Gary. 18 MR. HOLAHAN: Thank you. My name is Gary I am the Deputy Office Director in the 19 Holahan. I just wanted to take the 20 Office of New Reactors. opportunity thank the Committee for its to

21 opportunity to thank the Committee for its 22 consideration of all the Staff work on the AP1000. 23 I've had the privilege of dealing with the ACRS since 24 about 1972, and I must say I've never seen the level 25 of effort, and the level of dedication at the ACRS.

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91 The Staff has put in front of the ACRS 1 an 2 extraordinary level of -- number of design 3 certifications, activities. and number of The 4 Committee has been very helpful in dealing with those 5 activities, and keeping the Staff on track, and the 6 technical comments to and from the Committee have been 7 very valuable. And I think it speaks well to the 8 overall process of the NRC here in the design 9 certification, and, ultimately in COLs that this 10 is taking place. And I'd like activity to 11 particularly mention today Harold Ray and his efforts AP1000 Subcommittee. 12 lead the He's to been 13 extraordinary in dealing with quite an enormous 14workload. 15 We understand how burdensome that is on ACRS, and we thank them for all their extraordinary 16 17 efforts and having extra meetings, and dealing with 18 individual chapters, and coming to what I hope is a 19 successful conclusion to this activity. So, thank the Committee very much. 20 21 I'd like to turn -- can I --22 MEMBER RAY: Yes, please, go ahead. 23 Frank, you MR. HOLAHAN: have а few 24 remarks. 25 AKSTULEWICZ: Thank you. MR. I'm Frank **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS

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Akstulewicz, the Deputy Director for New Reactor 2 Licensing Operations. And I also want to echo Gary's comments about the support from the Committee in 4 support of this particular activity. I know at times 5 we flooded the members with documentation, and hundreds and thousands of pages in very short periods 6 7 of time, simply because that's the best we could do. 8 And the Committee members have been very accommodating in meeting with us on very short opportunity to review 10 that. But, also, Harold did mention the question

11 of the letters. I cannot impress upon the Committee 12 the importance of getting those letters. 13 They are 14 critical to our ability to move the rulemaking 15 forward. And, again, hopefully a satisfactory outcome 16 today will result in our ability to move the remaining 17 package, rulemaking package as a proposed rule to the 18 Commission probably by the end of December. So, with that, those are the conclusion of my remarks. 19

MEMBER RAY: Thank you, Frank and Gary. I 20 21 want to express appreciation to Eileen and all of the 22 Staff for their part, as well. It has been, I think, 23 a very productive relationship. We're not done yet, so we'll carry on then. Eileen, did you want to say 24 25 anything at this point?

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1	MS. McKENNA: No, sir.
2	MEMBER RAY: All right. The Subcommittee
3	to whom I want to express appreciation and all those
4	who attended in addition to the regular members, as
5	well as had 11 meetings, some 20 plus days on the DCD
6	itself, plus some time spent, not much yet, but more
7	in the future on the COLs, and our COL. And during
8	that, we've covered all the material that will now be
9	presented to the Full Committee. So there's nothing,
10	although it may seem at times like we're dwelling or
11	issues in more detail than you would expect at the
12	Full Committee, it's because of the content, and not
13	because we have not reviewed these matters at the
14	Subcommittee. It's simply time now to bring them to
15	the Full Committee for a final decision, if it's
16	deemed appropriate.
17	So, those are the preambles and the
18	roadmap that we'll be following. And with that, I
1.0	believe it a time to turn it even to the Applicant

19 believe it's time to turn it over to the Applicant, Westinghouse. 20

MR. ZIESLING: Thank you. Good morning, 21 22 Mr. Chairman, and members. My name is Rolf Ziesling. I'm the Director of U.S. Licensing with Westinghouse. 23 24 I have a brief introductory remark, and we'll get 25 started.

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Today represents a significant milestone the Westinghouse AP1000 certification amendment 2 in 3 application, and it's my privilege to be with you 4 today to represent many people that have worked so 5 hard to get us to this point. We're looking forward to an engaging day, and the opportunity to discuss key 6 7 aspects of our amendment application. We want to be 8 respectful of the time today, and make best use of it, 9 so our presentation today does focus on what we 10 consider to be the more significant topics and areas 11 of interest. However, given that this is a summary of the entire amendment application, we anticipate there 12 may be members of the Committee, or members of the 13 14public that may not have the background. 15 We will begin our presentation with some 16 very high-level brief background about AP1000, the

17 rulemaking history, and the status of new build 18 activities, because we believe it helps the frame the 19 context of the design finalization.

With that, I have with me today a number of highly qualified experienced and recognized experts to be speaking to the specific topics. To begin the main presentation, I'm going to turn it over to Mike Corletti, sitting beside me, who is the Director of AP1000 Plant Engineering. Thank you.

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MR. CORLETTI: Thank you, Rolf, and good 1 2 As Rolf said, the first presentation was morning. 3 outlined as an overview of the amendment. I'm qoing 4 to just briefly go over some key topics here, real 5 brief on AP1000 plant overview. We also have some more detailed presentation on some of the key features 6 7 of AP1000 throughout the day that we've worked into 8 some of the key issues. For those of you that may not 9 have -- some of this may be new to you. We have been doing AP1000 for a long time, with various different 10 11 members of the ACRS. This is the first time I think we can come to the Full Committee with such an overview 12 13 presentation.

As Rolf said, we'll do something on rulemaking history, some of the reasons why we have an amended design certification, and really we'll talk about, just to give you a brief status on where we are in our new plant build status, both overseas and in the United States.

So, this is the AP1000 plant overview in 20 21 one slide. AP1000 is our certified design that we are 22 now seeking an amended certification. It is a two-23 loop plant, two steam generators, four reactor coolant 24 pump, key difference is it uses passive safety 25 systems, a key feature of the AP1000. And with that,

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we've been able to achieve a very high degree of safety and reliability with the passive safety systems. Using the passive safety systems, we've been able then to simplify the non-safety systems, and significantly reduce our bulk quantities of safetygrade piping, safety valves, electrical cabling, and whatnot.

8 The plant is designed to be built in 9 We talk a lot about modular construction. modules. 10 Many benefits of modular construction include improved 11 quality. A lot of the construction is then done not at the site but, in fact, in factories, and shipped to 12 site, and assembled on site. But another big benefit 13 14of modular construction is, obviously, a reduced 15 construction schedule. We'll be talking about other features of the AP1000 as we go on today. 16

17 next slide is on the rulemaking The 18 history. I think it's just worth it to get everyone 19 maybe on the same page, same understanding. The AP1000 was certified on 2005, what we often refer to 20 21 as Rev 15, or DCD 15. However, in March 2006, we took 22 an initiative to start doing work to close out many of 23 the COL items. And the COL items were various types 24 of items, typically, that could not be resolved until 25 an applicant had been selected. Some of them are

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detailed engineering -- are based on some detailed engineering that needed to be completed before the COL could be -- the item could be closed.

It was at Westinghouse felt, and I believe 5 the Staff felt, and the Agency felt it was a benefit to do these under a design certification. You can 6 7 close as many of the COL items as part of 8 certification. You only have to do it one time, as opposed to doing it for each COL applicant. So, 10 Westinghouse and I believe the Agency, we all felt it 11 was a benefit to do these -- close these COL items under a certification. 12

We then continued to include those into 13 14Rev 16, a lot of it was updated in May. Included in 15 that was a significant design change that we're going 16 to be speaking about later with regard to the shield 17 building. And that was mainly driven by some changes 18 in the regulations with regard to nuclear power plants and their resistance to aircraft crash. 19 That drove a significant change, and we're going to be talking a 20 21 lot about that later today.

Rev 17 we submitted on September 15th, 22 23 2008, and that represented the design freeze point for our licensing review. And the significance of that is 24 25 unless there was no additional design changes that we

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intended to put into the DCD, unless there would be some reason that we absolutely had to. As you know, as we're completing final design, sometimes those details do end up having to be included into the DCD. But the design freeze point for the review was Rev 17, and we'll talk about that later.

7 Yesterday we signed out DCD 18, which 8 included all of the -- any changes that passed the 9 freeze point, or any changes that resulted from the 10 Staff review of the DCD that we needed to incorporate 11 into the DCD. So, I believe we signed that yesterday, 12 and we'll be delivering that today to the NRC.

I touched briefly on this, but really 13 14 wanted to touch on the objectives of the amendment, 15 and really -- and I touched on it, reducing the COL 16 Applicant's licensing risk by closing as many of these 17 items under design certification. Specifically, to 18 make progress and close out as many of the DACs that And we're going to talk about the Human 19 existed. Factor and I&C DAC, that significant progress was made 20 21 during this re-certification effort.

We also -- a change was to increase the site applicability. For the DCD Rev 15, the plant was certified for a hard rock site. We wish to expand our application to cover soft soil sites, as well, so with

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this amendment, that was a significant change, and a significant amount of review by the Staff in our application with regards to the soil sites, and the re-analysis associated with that. After we achieved certification for AP1000 now for hard rock and soft soil, we will have captured approximately 85 percent of the sites in the United States.

8 other things we did as far Some as 9 increasing the site, we did put in a more bounding 10 atmosphere dispersion factor to bound more of the 11 sites, as well, so we did incur some changes with 12 regard to improvements in the main control room filtration system to reduce operator dose, as well as 13 14some other changes associated with that.

15 Finally, did the site we -- on 16 applicability, finally did increase the we site 17 atmosphere conditions temperature to cover for 18 southern Florida, as we have one of the COL applicants 19 from sites in Florida, and our that's original certification did not bound those sites. So, we had 20 21 updated the design certification to include that site, 22 as well.

Finally, the shield building design, I didn't talk about that. And, also, there was incorporate other changes to the design finalization.

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As I said, we've been completing the design, doing 1 2 detailed design, actually building the plants in 3 China, some of the detailed design work has worked its 4 way into portions of the design that was included in 5 the DCD. Changes typically fall into three buckets, changes meet 6 really necessary to regulatory 7 requirements. Some changes were driven by customer 8 request, maybe improvements, operational improvements 9 that our customers had requested to include in the 10 design, increased spent fuel pool capacity, larger 11 turbine building to allow for for more room 12 So, some of those changes were also maintenance. included in the application, as well. 13 Now we can go 14 to the next slide. And, by the way, we will have 15 presentation, I think the last one today is some 16 selected design changes that we're going to talk about 17 in a little bit more detail than I just covered there. 18 So, new build status. And I believe this is really my last slide for the introduction to the 19 have ongoing four AP1000s under 20 amendment. We 21 construction in China. You see the status, various 22 stages of completeness. In Sanmen and Haiyang we've 23 actually placed the first three rings of the 24 containment vessel, placed some of the large 25 structural modules like CA20, which CA20, if you've

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seen, is essentially the majority of the auxiliary building, so it's a pretty large structure. Also, the CA01 structural modules, which include the reactor shield, missile shield around the reactor vessel. So, progress is being made in China, and in the United States. We are actively working with Vogtle and the Summer Project, actively preparing to begin to construction upon receipt of their COL.

9 The time line for these plants coming on 10 line really shows the projected time lines. The first plant in China is scheduled to come on line November 11 30th, 2013. And we continue to be on schedule. It is 12 a challenging schedule, but we are working there to 13 14meet that schedule. And then you see the dates of 15 some of the other units coming on line, two in 2014, and the fourth one in 2015. And you also see the 16 17 dates for the U.S. plants coming on line.

18 If there's no questions with regards to my 19 introductory remarks, or covering of the application, 20 I know it's pretty high-level, if there's any 21 questions at this time that could frame the discussion 22 for the rest of the day.

23 MEMBER RAY: And this is, perhaps, the end 24 of the open session, is it?

MR. CORLETTI: Yes, it is, after our

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102 presentation. 1 2 MS. McKENNA: My remarks will also be open, 3 sir. 4 MEMBER RAY: Correct. Any questions for 5 the Applicant on this high-level overview? I think most everyone is familiar with the information, but 6 7 it's helpful to see it all in one place, and in a 8 succinct way after having it stretched out over such a long period of time. Okay. 9 Thank you then. And we will hear from Staff in open session, and then we'll 10 11 qo into closed session. (Off the record comments.) 12 MS. McKENNA: They should be in there, 13 14unlike yesterday where it was my fault in delivering 15 the electronic version in advance. For some reason, I can't recognize the file name, where it might be 16 17 stored, so I apologize for the delay. 18 My remarks are relatively brief. I just 19 want to give an overview of what the Staff has been doing while the Applicant was preparing all their 20 21 design changes, and information, and the back and 22 forth. So three is introductory, Ι think my 23 Westinghouse covered the majority of the information 24 with respect to Revision 16, Revision 17. As was 25 mentioned, numerous Subcommittee meetings occurred **NEAL R. GROSS**

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over the last two years. We had made an overview 1 2 presentation to the Full Committee back two years ago, which was right after Rev 17, basically. And we were 3 4 still in some of the early stages of the review. And 5 that just covered in a summary fashion, kind of what we're -- the scope of the amendment in terms of 6 7 different kinds of changes that were included, such as 8 the closure of the COL information items, design 9 changes, DAC closure, that type of information. And 10 then we had our Full Committee meeting last month on 11 the long-term cooling for the GSI-191 discussions, and 12 as mentioned, Rev 18 is -- will be on our doorstep And we will be, obviously, anxious to 13 momentarily. 14 see how everything was included that we anticipated 15 based on our interactions. Then, of course, we are here today, hope to, hopefully, receive the 16 two 17 letters that were mentioned on the amendment, and on long-term cooling. 18

The next slide is just an outline of how we went about preparing the Safety Evaluation Report. As was mentioned initially, we got -- we received technical reports that had DCD markups, and supporting information, and the Staff reviewed those kind of as a package. And, at the time when they first came in, it was anticipated that they would, ultimately, be used

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to support departures in the COL process. But as was 1 2 mentioned, when the Part 52 Rule was revised to allow for amendments, it seemed more efficient to process 3 4 this set of changes in the amendment so they would be 5 then applicable to all COLs, and would be part of the standard design. So, that was the course that we 6 7 ended up moving to. So, at that point, we shifted more 8 into a review based on our Standard Review Plan 9 approach to the different chapters of the Design Control document. 10

11 An important point to note is that the Safety Evaluation Report that we've provided to you is 12 a supplement to the NUREG 1793 that was prepared for 13 14 the original Rev 15. It does not replace it, it 15 supplements it, and it focuses on the changes that 16 were made between Revision 15 and Revision 18, where 17 we are now. So, it looks a little different, perhaps, 18 than what you might have seen with the ESBWR, for 19 example.

We did follow the six-phase approach that we're using for our design certifications at this point, where we prepare a Safety Evaluation with open items that's provided to the Committee, and then resolve the remaining open items and return to the Committee with a final, what we call an advance final

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Safety Evaluation Report, and then following the Committee review, we issue the final Safety Evaluation Report.

4 In a couple of cases, we didn't actually 5 have an SER with open items for a chapter. A qood example was the shield building, where we can with a 6 7 final SER, but what we tried to do in those areas was 8 have an informational meeting with the Subcommittee to 9 -- so it wasn't going to be a big surprise at the end 10 to say here's something we need to make a decision on 11 in a short period of time. So, we did have a meeting 12 about a year or so ago on where we were on GSI-191, and in the spring, I believe it was, there was a 13 14 meeting on the shield building design to give some 15 orientation to the members of how that was evolving.

16 Just a comment on what you'll see in the 17 Safety Evaluation Report. We issued them by chapter, 18 and the first -- and it's Chapters 1-19 that track with the Standard Review Plan format of the chapters, 19 and what material is contained within them. 20 The 21 original 1793 SER had a couple of additional chapters. 22 There was a Chapter 20 that dealt with generic 23 issues, bulletins, and that kind of thing. There was 24 a Chapter 21 that had extensive discussion about 25 computer codes and all the testing that was done to

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support the AP1000 design. And there were no changes in that chapter in this amendment review. There was Chapter 22, which was where the Staff documented its consideration of RTNSS, Regulatory Treatment of Non-Safety Systems. There was no comparable DCD section, so that chapter pulled together information from several different places, and recorded the Staff's conclusions on that topic. And we did make a small correction to Chapter 22 in the course of the Safety Evaluation.

11 And, finally, you saw in the document what we call Chapter 23. This chapter contains the set of 12 design changes that resulted after the freeze point 13 14that was referred to, after Rev 17, the changes 15 engineering -- detailed engineering through the 16 review, other kinds of things, not directly prompted 17 in general by the Staff interactions, but changes that 18 the Applicant identified as being important to include in this design. And I mentioned to you the ISG-11, 19 that's Staff guidance on so-called licensing freeze 20 21 point, and it gives certain criteria for changes that 22 should be brought to the attention of the NRC, and not 23 be held to some later point in time. So, there were a 24 set of changes that were included, that came in in 25 this calendar year, 2010, that we chose to document in

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perhaps even more understandable to readers to see it presented as a description of a change, and all of its parts.

MEMBER RAY: Eileen, this is a good point 6 7 to spend just a minute on, I think, because this puts 8 changes in a different format, as you said. Now, that 9 happened as a consequence of timing and sequence, and so on, but what if all the changes had been addressed 10 11 that way, and then rather than trying to understand 12 them as -- on a chapter-by-chapter basis, these, as 13 you say, straddle chapters; and, therefore, we can 14 look at them as a change, which is the way most people 15 who have been in plants do.

MS. McKENNA: Right.

MEMBER RAY: And what do you -- do you draw any lesson from that?

19 MS. McKENNA: I mean, we've talked about 20 this, Ι know, in a number of the Subcommittee 21 And in hindsight, yes, I mean, there's meetings. 22 different ways we could have approached it. As I 23 mentioned, we started out first looking at the TRs, 24 which worked for a while, but it didn't really fit 25 with some of the way we do our reviews in terms of

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108 different review branches having responsibility for particular areas that are outlined in the Standard Review Plan. I see the merit of actually doing it like we did in Chapter 23, and hindsight is always better, whether that would have made it more understandable overall. Well, I don't draw MEMBER RAY: that conclusion at this point, because too many straddles become confusing, too. MS. McKENNA: Yes. And we were also trying

to marry it up with the earlier SER, which was on the 12 Chapter 1-19 basis, so that was the original approach 13 14 that we were going forward. And we probably would 15 have stayed on that approach, even with these last 16 changes, but we were kind of impressed that because 17 they affected multiple chapters, then it was either 18 we're going to have issue them, and reissue them, or 19 hold them back, and it really --

MEMBER RAY: Yes, that's right.

MS. McKENNA: -- causes some dilemmas on -

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23 MEMBER RAY: But it's still an interesting 24 comparison to look at a change in Chapter 23, as 25 compared with three or four places that it affects the

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109 SERs when viewed on a chapter basis. 1 2 McKENNA: And even in Chapter MS. 23, 3 there's a range. There are cases where it affects one 4 chapter only. It's an instrumentation issue, and it's 5 fairly focused. There are others that affected four or five chapters, so it was a mixed bag. 6 MEMBER RAY: It's interesting to look at. 7 8 I'm suggesting the Committee step back after we're 9 done and see if we can draw any conclusions from this experience. But that's one thing that I think is an 10 11 indication of how things look differently when viewed through the prism of individual changes, as opposed to 12 impacts on different chapters. 13 14 MS. McKENNA: I haven't been close to the 15 amendment, for example, on ABWR, which is obviously 16 much narrower in scope, as to how that model --17 MEMBER RAY: Anything would be narrower in 18 scope. (Laughter.) 19 MS. McKENNA: Can't disagree. 20 21 MEMBER RAY: Okay. Thank you. Go ahead. 22 MS. McKENNA: And the last part that we 23 would have when we ultimately issue this as a NUREG, 24 is a number of appendices that are included. And this 25 has such things as the list of staff contributors, **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W. WASHINGTON, D.C. 20005-3701

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references, the Committee's letter will be made as an appendix to the NUREG, those type of things that will be in these various appendices.

4 My last slide really is just a brief 5 statement about Next Steps, just so we see where we're going from here. We're looking forward to a letter 6 7 from the Committee in this meeting in December. 8 Assuming that's favorable, we would be planning to 9 move forward with the proposed rule package to the I am expecting receipt of Revision 18 10 Commission. 11 momentarily. We are preparing a public version of all the chapters of the advance Safety Evaluation Report, 12 and SECY Paper also includes, obviously, a Federal 13 14 Register Notice for the proposed rule.

15 We comment here that the advanced Safety Evaluation Report that we are putting forward does 16 17 have confirmatory items. You may have noticed that when you were reviewing the documents. Now, we were 18 very careful in our review to make sure that where we 19 were calling things confirmatory items, we really knew 20 what we were confirming, that there was specific 21 22 markups that had been offered in RAI responses, and 23 open item responses that the Staff considered as part 24 of their review. So, when we are looking at Rev 18, 25 we are doing that kind of verification that the

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agreements and understandings that we've already reached are fulfilled in Revision 18. It's not that we need to review de novo Revision 18, but we will, obviously, satisfy ourselves that the changes have been appropriately made in Rev 18, and that in the light of day they still make sense when we put it all

8 hypothesize MEMBER RAY: Let me that 9 perhaps there will be something in our letter that 10 Applicant would want to respond to as part of this 11 finalization. There's been mention made of an 12 Amendment 19. Do you have any comment on that?

MS. McKENNA: Yes, I think we came up a 13 14little bit yesterday, like I say, we have Revision 18 15 Then we have like 270 some confirmatory coming. It's a lot of items to go in, and when people 16 items. 17 -- when we start looking at it in the light of day, 18 and you put four confirmatory items in the same chapter, do they all really make sense in the way that 19 if you look at them again singularly, they made sense. 20 21 But when they all line up together, is there 22 something that just doesn't work for us. So, I think 23 we can envision that there might be some of those kinds of things that well, we really would like to 24 25 have something slightly different in the final rule.

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So, we are planning as a contingency, planning for the 1 possibility of a Revision 19 that would come sometime 2 3 in the spring after the proposed rule has gone out for 4 comment. We could have things in the public comments 5 that would cause us to seek a change in Revision 19. There could be new information that arises in the 6 7 passing of time that would lead us to make a change. 8 So, I think we are contemplating that there would be a 9 need, hopefully in a very limited area or sense for 10 Revision 19. MEMBER RAY: Members have questions of

MEMBER RAY: Members have questions ofEileen? Thank you, Eileen.

MS. McKENNA: The final part of that is 13 14 that we send the paper up to the Commission. And kind 15 of at that point, we're no longer in command of our 16 schedule, but destiny in terms of our we are 17 contemplating that the Commission would then approve 18 issuance of the proposed rule for public comment, would go through the 75-day public comment period, 19 receive the comments, develop responses, prepare a 20 21 final rule, and provide that paper back to the 22 Commission. Our goal that we're trying to support is 23 final rule in September 2011. That goal is to support 24 the plans we have primarily for the issuance of the 25 combined licenses and the desires of the Applicants

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1	there for when they would like to use their license.			
2	So, that's the timetable that we're on.			
3	MEMBER RAY: Thank you, Eileen. Again, any			
4	questions? If not, Mr. Chairman, I think we are now			
5	ready to move to the closed session, and proceed with			
6	the agenda, as outlined. So with that, I turn to			
7	we don't hear, I guess, and your helpers, can we make			
8	sure that it's understood that the open phone line is			
9	closed accordingly.			
10	(Whereupon, the Open Session proceedings			
11	went off the record at 11:08 a.m. to resume at 5:15			
12	p.m.)			
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1	P-R-O-C-E-E-D-I-N-G-S		
2	(5:15 p.m.)		
3	CHAIRMAN ABDEL-KHALIK: We are back in		
4	session. We will get back to our discussion of the		
5	AP1000. And Harold?		
6	MEMBER RAY: Mr. Chairman, we are at		
7	Item 10 on the agenda, which is the opportunity for		
8	public comment. We have one person at least, we		
9	believe, who would wish to make a public comment. We		
10	will, having heard that person, see if there are any		
11	others. But is Mr. Louis Zeller on the line?		
12	MR. ZELLER: Yes, I am here.		
13	MEMBER RAY: All right, fine, Mr. Zeller.		
14	This is, as I think you know, the full Committee		
15	meeting of the Advisory Committee on Reactor		
16	Safeguards. And if you would begin by giving us your		
17	association, introduce yourself a little bit, and then		
18	proceed.		
19	MR. ZELLER: Yes, of course. Thank you.		
20	I appreciate this opportunity today. I know you all		
21	are busy.		
22	My name is Louis A. Zeller, and I am the		
23	Science Director with Blue Ridge Environmental Defense		
24	League. I have been working for them since 1986. And		
25	I live in North Carolina. I work in seven		
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southeastern states, which -- in which we have projects and chapters.

My statement today has to do with the AP1000 reactor, which is under consideration by this Committee. I want to just preface my statement by saying that the definition of whipsaw is to get advantage two ways at once, as in a card game by winning two different bets in a single play.

As a matter of fact, on November 30, just this last week, the joint intervenors' August 12th motion to admit a new contention designated Safety 2 was denied in the matter of Southern Nuclear Operating Company's Vogtle Electric Generating Plant Units 3 and 4.

15 We said that the design of AP1000 reactor 16 presented special risk of containment, corrosion, and 17 coating failure, disregarding that each plant received 18 special intensive inspections that addressed the special circumstances released by every plant. 19 As a result, the plant Vogtle COLA does not satisfy General 20 21 Design Criteria 53.

We base this in part on a transcript in the meeting of the Advisory Committee on Reactor Safeguards of June 25th, in which Chairman Ray addressed the issues of inspection and containment and

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containment coating associated with the AP1000 design. He said that they would be addressed not in the generic view of the AP1000 design, but within the individual COL proceeding.

Chairman Ray said that -- specifically that that will be taken up as part of the COL. So if you don't see it being discussed in the context of the DCD, it is because it is there and not any other place. That's in the transcript of the meeting of the --

 11
 MEMBER RAY:
 Let me interrupt you and

 12
 say -

MR. ZELLER: Of course --

14 MEMBER RAY: This is Chairman Ray 15 speaking, and I stand by that statement. We will 16 consider what you just said in the context of the COL 17 when we take it up. And that is pending early next 18 year or maybe even later this month, it depends.

I appreciate that. 19 MR. ZELLER: And, in 20 fact, we rely upon -- in fact, we trust and rely upon the judgments of the Advisory Committee on Reactor 21 22 Safequards in this matter. In fact, we believe that, 23 and that is in fact why we and two other public 24 interest groups submitted а contention for 25 consideration by the ASLB in the COL proceeding at

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Plant Vogtle, in fact.

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2 however, the ASLB has dismissed the 3 contention, saying that our intent is to assign --4 this is from their ruling -- "To assign significance 5 to the ACRS Chair's purported characterization of the report and the issues it raises, is a delineation 6 7 that, even if correct, is irrelevant." And they go on 8 relevant inquiry to say, "The is when joint 9 intervenors reasonably should have realized that a litigable issue existed." 10

11 Issues that the judges considered, the 12 ASLB, were whether this was an exceptionally grave matter, or if there would be a materially different 13 14 result. In other words, the ASLB, cognizant of the 15 Chair's statement, and which we reproduced in our 16 August motion, said there was nothing which would 17 warrant attention in a COL proceeding. Their ruling 18 centered on good cause and the extent to which the dissipation hours would delay the proceeding. 19

20 MEMBER RAY: Well, Mr. Zeller, it seems to 21 me you are conflating the ASLB proceeding with the 22 review by the ACRS, which are two separate and 23 different parts of the overall process of the 24 Commission's actions on an application.

MR. ZELLER: No, sir. With all due

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1	respect, I am actually getting to show you where the		
2	differences and the distinctions are. If I can		
3	proceed.		
4	MEMBER RAY: I will stand by what I said		
5	I the ASLB has rendered their decision in their		
б	proceeding. We have yet to take up the matter in the		
7	COL review that we will conduct.		
8	MR. ZELLER: I understand. Well		
9	MEMBER RAY: Well		
10	MR. ZELLER: Well, I believe that the		
11	Atomic Safety Licensing Board concluded that a		
12	procedural matter such which are arguable as when		
13	intervenors reasonably should have realized something,		
14	and a conjectural delay in the licensing of the plant,		
15	which is already delayed until June 2011, without our		
16	motion, outweigh other factors, including the		
17	availability of other means to protect our interests		
18	as intervenors and members of the public in presenting		
19	specific identifiable safety problems.		
20	And I understand the ACRS will continue in		
21	its deliberations. However, we have a venue before		
22	the in the immediate issue at the licensing of a		
23	reactor at which many of these things have to be		
24	considered.		
25	The bottom line is that the ruling said		
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that contention amounts to no more than an improper challenge of the AP1000 standard design. We said the element containment common in every cause of degradation has been reliance on ASME inspection requirements.

However, we are precluded from challenging 7 ASME inspection requirements in the proceeding, the 8 proceeding, because NRC regulations COL directly incorporate ASME inspection requirements by reference. And you understand the implications of that. So that 10 11 is why we are feeling whipsawed.

My questions to the Committee today are: 12 if the AP1000 containment coating factor 13 is an 14 important element of the system, and the accessibility 15 for inspection is yet to be addressed, are the issues of nuclear reactor containment coating and inspection 16 17 relevant or -- irrelevant or insignificant?

18 Is it true that nothing in the ACRS's June 25th statement warrants attention in the COL 19 20 proceeding? And this I am quoting from their ruling. 21 If the answer to either of these questions is no, then where may the matters raised in the June 25th 22 23 ACRS Subcommittee meeting be addressed? When will 24 they be addressed? And who might bring them?

> With all due respect, Mr. Chairman, we

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120 feel like we are being whipsawed. 1 2 MEMBER RAY: We understand your statement. 3 Do you have anything more you wanted to share with 4 us? 5 MR. ZELLER: No, that's all I have to share with you today. I wanted to bring these matters 6 7 to your attention, and I -- I mean, I respect what 8 this Committee has attempted to do. But we feel that 9 at -- an important element in the licensing and 10 construction of a nuclear powerplant has somehow 11 fallen through the legalistic cracks in the nuclear 12 regulatory's overarching system here. I could go on. In fact, I would be happy 13 14 to provide you with a letter which details some of 15 these concerns that we have, if you would allow me to 16 do that. 17 MEMBER RAY: Well, we certainly are in the 18 process of the COL review, most of which has yet to We will receive any comments from the public 19 occur. without discrimination, and so, therefore, I think the 20 21 answer to your question, may you submit comments, 22 would be yes, you may. 23 Chairman MR. ZELLER: Ray, we were 24 actually buoyed up by your statements in -- about the 25 AP1000 back in June, but -- and we were verv **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS 1323 RHODE ISLAND AVE., N.W.

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121 1 discouraged when we saw that it came to naught when we 2 attempted to apply it to the combined operating 3 license proceeding. 4 MEMBER RAY: Well, all I can say is, 5 again, I think you are conflating two things which are independent -- ASLB and the ACRS. But I think it is 6 7 time to conclude whatever it is you would like to say 8 to us, and we will see if there is anything else 9 anyone else would like to say. 10 MR. ZELLER: That's all I have to say. 11 Might I expect any kind of reply to the questions I 12 have posed? So we will take into 13 MEMBER RAY: No.

14 account all input, and it becomes part of our 15 deliberations in the final conclusion that the 16 Committee, as a whole, reaches. And we appreciate 17 your input, but we do not, as a general matter, 18 respond to questions put to the Committee.

MR. ZELLER: All right, then. Thank you. MEMBER RAY: All right. Are there any other public comments, any other members of the public here or on the line, that would like to comment? (No response) Hearing none, we will turn it back to you,

25 Mr. Chairman.

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122 CHAIRMAN ABDEL-KHALIK: Thank you. Are 2 additional comments there any on the AP1000 3 presentations that we just heard, or should we proceed 4 to the next item on the agenda? 5 (No response) If none, we will proceed to the next --6 7 the agenda, at this time, is sort of we have no 8 additional items on the agenda for today. But what I 9 would like to do is to utilize the time available to us to read the draft letters that have been prepared. 10 11 The first letter pertains to the Kewaunee license renewal, and the second letter pertains to the long-12 term cooling that Sanjoy has prepared. 13 14I would like to start with the Kewaunee 15 license renewal draft letter, because that is ready at this time, and then we will read Sanjoy's letter. 16 17 Now, I would like to point out that as far 18 as the Kewaunee license renewal letter is concerned, as you heard this morning, there are issues that had 19 not been fully addressed in the FSER, in the final 20 21 safety evaluation report, excuse me. And, therefore, 22 the final safety evaluation report will be amended and 23 will be issued at a later point. therefore, the options before 24 And, us 25 would be to write a letter, hold onto the letter until **NEAL R. GROSS** COURT REPORTERS AND TRANSCRIBERS

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1	this final safety evaluation report is issued, assure		
2	ourselves that there are no surprises in the updated		
3	FSER, and then issue the letter, if that is the case.		
4	So at this point, ma'am, we are off the		
5	record.		
6	(Whereupon, at 5:27 p.m., the proceedings in the		
7	foregoing matter went off the record.)		
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Kewaunee Power Station

Presentation to Advisory Committee on Reactor Safeguards - License Renewal

December 2, 2010



Participants

- Steve Scace Site Vice-President
- Alan Price Engineering Vice-President
- Michael Wilson Station Safety & Licensing Director
- Stew Yuen Engineering Director
- Paul Aitken License Renewal Project Manager
- LR Project Team Members
- Station Staff



Presentation Outline

- Background
- Operating Information
- SER Open Items
- Emergent Items



Background

Site Description

- ◊ Located in Kewaunee County, Wisconsin
- ◊ Once-through cooling from Lake Michigan
- ◊ 2-Loop Pressurized Water Reactor
- Westinghouse Electric Corporation (NSSS), Pioneer Service and Engineering Co. (A/E)
- ◊ Turbine / Generator Westinghouse
- ◊ 1772 MWt
- ◊ Steel Containment Vessel with Concrete Shield Building



Background





Background

Plant History - Licensing

- Construction permit
- Operating license
- Commercial operation
- Uprated Power License
 - ◇ MUR (1.4%, 23 MWt)
 - ◊ Stretch uprate (6%, 99 MWt)
- Plant Owner change to Dominion
- Operating License expires

August 6,1968 December 21, 1973 June 16, 1974

July 2003

February 2004

July 2005

December 21, 2013



Operating Information

Current Plant Status

- ◊ Operating Cycle 31
- ♦ 100% Power
- 407 Days On-line
- ♦ 1374 Days since Last Automatic Trip
- ♦ Next refueling outage: February 2011



4 Open Items (OI)

- OI 3.0.3.2.20-1 Use of FatiguePro Software
- OI B2.1.32-1 Work Control Process Program
- OI 3.1.2.1.7-1 S/G Divider Plate Cracking due to PWSCC
- OI 3.0.3.2.4-1 Recent Operating Experience for Buried and Underground Piping and Tanks



OI 3.0.3.2.20-1: Use of FatiguePro Software

- Issue
 - Initial evaluation of fatigue life utilized EPRI FatiguePro stress-based fatigue (SBF) monitoring
- Resolution
 - Two components were re-analyzed to support closure of Commitment 41
 - Two additional components will be re-analyzed prior to PEO



OI B2.1.32-1: Work Control Process Program

- Issue
 - Selection of one-time inspection sample sizes and schedule for completion of inspections
 - Minimum sample size for periodic inspections and inspection frequencies for inspections of internal surfaces
 - Capability to detect aging effects, based on OE examples submitted
 - Clarification of the commitment to implement the WCP program



Resolution

- ♦ <u>M32</u>: Clarified the methodology used to determine one-time inspection sample size
- <u>M38</u>: Clarified that a leading component group will be established based on OE, environments, stagnant locations and will be inspected prior to the PEO and audited to confirm inspections are completed
- New Commitment 47 established to provide relevant OE within 2 years after implementation of WCP
- Clarified that the WCP AMP is a new AMP and that one-time inspections will be completed prior to period of extended operation



DI 3.1.2.1.7-1: S/G Divider Plate Cracking due to PWSCC

- Issue
 - identification of materials of construction for SG divider plate assembly
 - evaluation of the potential for PWSCC cracks to propagate to base materials or cladding, and provide an inspection program if required.
- Request was based on recent foreign operating experience with SG divider plate cracking



- Resolution
 - EPRI Steam Generator Task Force evaluating concern for generic industry action
 - KPS will perform an inspection of each SG to assess the condition of the divider plate assembly
 - The inspection technique will be capable of detecting PWSCC in the divider plate and the associated welds
 - The inspections will be completed prior to exceeding 10 years into the PEO
 - Dominion will continue to actively participate in the EPRI studies



OI 3.0.3.2.4-1: Recent OE for Buried and Underground Piping and Tanks

- Issue
 - Identification of buried and underground components addressed by the Buried Piping and Tanks Inspection and the External Surfaces Monitoring programs;
 - Identification of updates to these programs to incorporate lessons learned from recent events related to buried piping leakage



Buried piping and tanks, and planned inspections

<u>System</u>	Inspections	Cathodic Protection
CW piping	Two*	Yes
DG FO piping	One	Partial
DG FOST	One tank	Yes
FP piping	Three	No

*One for stainless steel piping and one for carbon steel piping



- Resolution
 - Perform visual inspections of a representative sample of material/protective measure combinations for in-scope buried piping and tanks
 - Cathodic Protection system will be maintained and functional a minimum of 90% of the time
 - NACE cathodic protection surveys are performed at least annually
 - Committed to perform an inspection of the diesel fuel oil system piping that is not cathodically protected
 - Commitment enhanced to perform inspections of the buried piping and tanks prior to PEO and each 10 years thereafter



Emergent Items

- Non-EQ Inaccessible Medium-Voltage (MV) Cable Program
- S/G Tube-to-Tubesheet Weld Cracking
- Most Limiting Component for EAF Evaluation
- Additional ASME Class 1 Small-Bore Piping Socket Weld Inspections



Non-EQ Inaccessible MV Cable Program

- Issue
 - Based on industry OE (GL 2007-01), the staff concluded that low voltage power cables should be included in an AMP
- Resolution
 - Kewaunee has not experienced any 480V to 35 kV power cable failures due to aging
 - Kewaunee will include the low-voltage power cables (480V) that have a license renewal intended function
 - Kewaunee will test the inaccessible low-voltage power cables prior to the PEO and at least every 10 years thereafter



S/G Tube-to-Tubesheet Weld Cracking

- Issue
 - PWSCC in the welds could lead to crack propagation through the welds causing a primary-to-secondary pressure boundary failure
- Resolution
 - Establish a technical basis which concludes that the structural integrity of the weld is adequate with a crack, and
 - Establish a technical basis which concludes these welds are \cap not required to perform a RCPB function, or
 - Perform a one-time inspection of a representative number of Ο tube-to-tubesheet welds in each SG to determine if PWSCC cracking is present
 - S/G inspections will be completed prior to exceeding 10 years 0 into the PEO



Most Limiting Component EAF Evaluations

- Issue
 - Determine if components beyond the NUREG/CR-6260 locations are more limiting and need to be evaluated for the environmental effects of the RCS environment.
- Resolution
 - Kewaunee will perform a review of design basis ASME Class
 1 component fatigue evaluations to determine if there are more limiting locations
 - If more limiting locations are identified, the most limiting location will be evaluated for the effects of reactor coolant environment on fatigue usage prior to the PEO


SME Class 1 Small-Bore Piping Socket Weld Inspections

- Issue
 - NRC staff established an inspection criterion in NUREG-1801, Revision 2 for ASME Class 1 small bore piping socket welds.
- Resolution
 - Kewaunee will perform 10 volumetric examinations, or 5 destructive examinations if a demonstrated, nuclear-industry endorsed examination method is not available
 - 4 volumetric examinations, or 2 destructive examinations, will be performed prior to PEO. Remaining exams will be performed within 3 years of entering PEO



Kewaunee License Renewal

Questions



United States Nuclear Regulatory Commission

Protecting People and the Environment

Advisory Committee on Reactor Safeguards (ACRS) License Renewal Full Committee Kewaunee Power Station (KPS)

Safety Evaluation Report (SER)

December 2, 2010

John W. Daily, Project Manager Office of Nuclear Reactor Regulation



Presentation Outline

- Overview of the SER
- Closure of Open Items
- Resolution of Supplemental Issues
- Conclusion



Overview (SER)

- Safety Evaluation Report (SER) with Open Items was issued July 16, 2010
- The 4 Open Items for the SER have been closed:
 - Use Of FatiguePro[™] Software in Metal Fatigue Calculations (OI 3.0.3.2.20-1)
 - Ni-Alloy Steam Generator Divider Plate Cracking due to PWSCC (OI 3.1.2.1.7-1)
 - Incorporating recent operating experience for buried and underground piping and tanks (OI 3.0.3.2.4-1)
 - Work Control Process Program Issues (OI B2.1.32-1)
- Safety Evaluation Report (SER) closing these items was issued November 4, 2010



Other Issues Resolved

- Resolutions on two ACRS Subcommittee questions
 - ACRS Subcommittee concern on Small-Bore Piping Commitment
 - ACRS Subcommittee question on Compressed Air Program
- Three Supplemental Issues of interest
 - Inaccessible Low Voltage Cables
 - Potential PWSCC in SG Tube-Tubesheet Welds
 - Minor issues in Selective Leaching, Structures Monitoring AMPs



Metal Fatigue of Reactor Coolant Pressure Boundary: OI 3.0.3.2.20-1

- Use of FatiguePro[™] in stress-based portion of metal fatigue calculations did not incorporate all six portions of stress tensor
- Applicant performed updated, confirmatory fatigue calculations for the RCS charging line nozzle and the Pzr surge line hot leg nozzle satisfactorily
- Staff noted the applicant had also used FatiguePro[™] for two other locations: Pzr Lower head, and Pzr-end surge line nozzle
- Commitments to review & ensure its ASME Class 1 fatigue evaluations fully bound the issue for the plant, to evaluate the Pzr. Lower head and surge line per ASME III, NB-3200, and to not use FatiguePro's[™] SBF module in its AMP



PWSCC Potential in Ni-Alloy Steam Generator Divider Plates: OI 3.1.2.1.7-1

- Extensive cracking due to PWSCC has been identified in some European SG divider plate assemblies, especially in stub-runner/divider plate region
- Staff concern of possible existence, and of propagation into tubesheet cladding, tubesheet or into SG-RCS channel head
- In response to RAIs, applicant:
 - Stated its SG divider plate assemblies are Alloy 600 and welds are Alloy 52/152 material
 - Committed to perform an inspection of each SG divider plate prior to 10 yrs into PEO to detect whether such cracks are occurring in SG divider plate assemblies
 - Committed to remain active in EPRI SGMP activities to study the issue



Buried/Underground Piping and Tanks: OI 3.0.3.2.4-1

- In light of recent industry events involving leakage from buried/underground piping and tanks, staff is concerned about continued susceptibility to failure of buried/underground piping within the scope of license renewal
- In response to staff RAIs, applicant committed:
 - Maintaining its cathodic protection system 90+% available during PEO
 - Conducting NACE surveys annually
 - Enhance its AMP to visually inspect a representative sample of each material/protective measure combination for in-scope buried/underground piping and tanks,
 - Prior to PEO, in first 10 years and in second 10 years of PEO



Work Control Process Program Issues: OI B2.1.32-1

- Staff noted a number of issues in the revised Work Control Process AMP, primarily in the characterization of sample sets and assurance of adequacy of both depth and breadth of the Program
- Applicant committed to:
 - Completely specifying minimum percentages/ sample sizes/ inspection frequencies of each component/material population
 - Audit the periodic preventive maintenance and surveillance activities to confirm that all material/environment combinations have been inspected; inspect those that have not been
 - Audits will occur prior to PEO and each 10 years of the PEO



Subcommittee Question #1

Small-Bore Piping Commitment revision

- ACRS concern regarding whether proper quantity of small-bore socket welds would be destructively tested under applicant's commitment (part of SER 3.0.3.2.1)
- Staff notes that applicant reports no history of small-bore weld failures out of ~345 total/ 35+ years in operation
- Applicant committed to the following for small-bore socket welds:

Timeframe	NDE / Destructive (Combination)	Expectation
< PEO	4 NDE / 2 Destructive	NDE: 3% / max 10 Destructive: 1.5% / max 5 (for plants with no history of failures)
PEO + 3 yr	6 NDE / 3 Destructive	



Subcommittee Question #2

Compressed Air Question from ACRS Subcommittee

- ACRS concerned whether down-stream lines adversely affected by the automatic IA dryer bypass on High-Dryer-DP Alarm
- Applicant provided clarifying information:
 - The alarm sounds in the MCR, Control Room Operator acknowledges
 - IA Dryer bypass line opens automatically
 - Operator responds using procedure and swap out dryer/air filter for another dryer/filter to maintain downstream air quality.
 - Total time for response is less than 45 minutes



Supplemental Issue #1

Inaccessible Low Voltage Electrical Cables

- Recent OE from licensees in response to GL 2007-01 indicates some non-EQ, low voltage (480 V – 2 kV AC) inaccessible cables at plants have suffered failures, related to water degradation/ submergence
- Applicant responded to the issues:
 - No failures of these cables identified in its GL 2007-01 response, and none since that review
 - Low voltage (480 V-2kVAC), inaccessible cables would be added to the AMP. Some cables and 2 more manholes added as a result.
 - Inspections of manholes/ pulling pit showed only minimal water, no evidence of submergence or wet cables.
 - Manhole inspections will be done prior to PEO and based on plant experience, but at least every 2 yrs
 - Testing of cables will be done prior to PEO and based on plant experience, but at least every 10 yrs



Supplemental Issue #2

SG Tube-Tubesheet Welds and Potential PWSCC

- SER Section 3.1.2.2.16 Item 1 deals with this issue
- For Alloy 600 tubesheet cladding, autogenous welds may not have sufficient PWSCC resistance, when tubes are Alloy 690.
- Applicant committed to developing plan prior to PEO, to exercise 1 of 2 options:
 - Perform analytical evaluation of tube-tubesheet region to establish technical basis of boundary being maintained even if cracked, and that the weld is not needed for RCPB integrity
 - Perform one-time inspection of representative number of welds in each SG. If cracking identified, evaluate/repair, and institute aging management inspections for remaining life of SGs.



Supplemental Issue #3

Minor issues from completeness review :

- Selective Leaching of Materials AMP:
 - Applicant revised its program to include specific information regarding how the selected set of components are to be sampled and how the sample size will be determined.
- Structures Monitoring Program AMP:
 - Clarified that the inspection interval for in-scope masonry walls was at least every five years
 - Clarified that the Structures Monitoring Program's inspection interval for the in-scope accessible structures was at least every five years
 - Agreed to amend its AMP to include acceptance criteria according to ACI 349.3R-96 for Structures Monitoring Program inspections.
- Applicant responses acceptable, & will be incorporated into the final published SER



Conclusion

On the basis of its review, the staff determines that Dominion Energy Kewaunee, Inc. has met the requirements of 10 CFR 54.29(a) for the license renewal of Kewaunee Power Station.

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