



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001

February 15, 2011

MEMORANDUM TO: ACRS Members

FROM: Kent L. Howard, Sr., Senior Staff Engineer */RA/*  
Reactor Safety Branch A, ACRS

SUBJECT: CERTIFICATION OF THE MINUTES OF THE PLANT LICENSE  
RENEWAL SUBCOMMITTEE MEETING ON SEPTEMBER 8, 2010

The minutes for the subject meeting were certified on February 12, 2011. Along with the transcripts and presentation materials, this is the official record of the proceedings of that meeting. A copy of the certified minutes is attached.

Attachment: As stated

cc w/o Attachment: E. Hackett  
C. Santos  
Y. Diaz-Sanabria

cc w/ Attachment: ACRS Members



Certified by: J. Sieber  
Certified on: February 12, 2011

**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2, AND 3  
LICENSE RENEWAL SUBCOMMITTEE  
MEETING MINUTES  
September 8, 2010  
Rockville, MD**

**INTRODUCTION**

The Advisory Committee on Reactor Safeguards (ACRS) Subcommittee on the Palo Verde Nuclear Generating Station Units 1, 2, and 3 License Renewal met on September 8, 2010, at 11555 Rockville Pike, Rockville, MD, in the Commissioner's Hearing Room. The purpose of the meeting was to hear presentations and discuss the information on the Palo Verde Nuclear Generating Station Units 1, 2 and 3 License Renewal Application (LRA). Mr. Michael Benson was the Designated Federal Official for this meeting. The Subcommittee did receive a written comment from a member of the public, Mr. Bob Leye, challenging the technical basis of Part 54 for reactors. There were no requests to make oral statements from members of the public regarding the Subcommittee meeting. The meeting was convened at 1:27 pm and adjourned at 4:52 pm.

**ATTENDEES**

**ACRS**

M. Bonaca, Chairman  
S. Armijo, Member  
J. Stetkar, Member  
S. Khalik, Member  
W. Shack, Member  
M. Ryan, Member  
J. Barton, Consultant  
K. Howard, ACRS Staff  
M. Benson, ACRS Staff

**NRC Staff**

L. Regner, NRR/DLR  
D. Wrona, NRR/DLR  
B. Holian, NRR/DLR  
G. Pick, NRC/RIV  
A. Hiser, NRR/DLR

**ARIZONA PUBLIC SERVICE COMPANY (APS) PRESENTERS**

J. Hesser, APS  
A. Krainik, APS  
M. Karbassian, APS  
R. Schaller, APS

**OTHER ATTENDEES**

See Attachment 1

The presentation slides and handouts used during the meeting are attached to the office copy of the transcript of this meeting. The presentations to the Subcommittee are summarized below.

## **SUMMARY OF MEETING**

### **(Reference to Transcript Page Numbers and Presentation Slide Numbers)**

#### **Introduction**

Dr. Mario Bonaca, Chairman of the Palo Verde Nuclear Generating Station Units 1, 2, and 3 (PVGNS) License Renewal Subcommittee, introduced the Subcommittee Meeting and explained that the Subcommittee would review the license renewal application for the Palo Verde Nuclear Generating Station Units 1, 2, and 3 (PVGNS) and the associated Draft Safety Evaluation Report with open items. He stated that the Subcommittee would hear presentations from representatives of Office of Nuclear Reactor Regulation (NRR), and the applicant, Arizona Public Service Company (APS). He also stated that the Subcommittee would gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate for deliberation by the Full Committee. (Open Transcript Pages 5 - 6)

#### **PRESENTATIONS**

##### **Opening Remarks on Palo Verde Nuclear Generating Station License Renewal**

Mr. Brian Holian, the Division Director for the Division of License Renewal in the Office of Nuclear Reactor Regulation (NRR), provided brief opening comments and introductions of the staff's review of the Cooper License Renewal Application. He then called upon the applicant's presenter, Mr. John Hesser, PVNGS Vice President for Nuclear Engineering. (Open Transcript Pages 7 – 11).

##### **APS Overview**

Mr. John Hesser, Vice President of Nuclear Engineering at Palo Verde Nuclear Generating Station, provided a brief overview of the reasons for today's Subcommittee meeting and introduced the presenters from APS. (Open Transcript Pages 11 - 14).

##### **Arizona Public Service Presentation**

In the meeting, Arizona Public Service Company provided a brief overview of the Palo Verde Nuclear Generating Station plant history and background, major improvements and long range planning, license renewal application, safety evaluation report with open and confirmatory items, and regional inspection items. (Open Transcript Pages 11 - 95) and (APS Slides entitled, "*Palo Verde Nuclear Generating Station, ACRS License Renewal Subcommittee*, September 8, 2010," Pages 1 - 35).

##### **Subcommittee Discussion**

In response to a question from Member Stetkar, APS responded to questions concerning water chemistry problems and spray pond condition that was posed earlier during the APS presentation on major improvements and long range planning. Mr. Radspinner of APS, responded that the water chemistry problems were due to the combinations of chemicals used to treat the spray ponds, and that resulted in a fouling mechanism. Mr. Radspinner stated that the problem has since been corrected. Mr. Schrecker of APS, responded to the question on spray pond condition. He stated that APS had observed horizontal and vertical cracking above the water line, and that the cracking was non-structural degradation. He also stated that there were plans to repair those cracks by 2015. Cracks below the water line were also being monitored, and the cracks that were discovered in all six spray ponds had been repaired. (Open Transcript Pages 23 - 27).

### **Subcommittee Discussion**

In response to a question from Member Shack, APS responded to a question concerning the stress corrosion possibilities of the half nozzle repair to the Alloy 600 material in the reactor coolant hot leg and why it was not considered in the Time Limited Aging Analysis (TLAA). Mr. Meeden of APS, responded that stress corrosion and cracking on the inside of the hot leg was addressed. A section of Alloy 600 was left in place on the lower head of the pressurizer where the applicant performed heater sleeve repairs. The repair was actually an external pad repair, and they did look at crack propagation with respect to the repair, and the Alloy 600 area was no longer the pressure boundary. (Open Transcript Pages 31 - 34).

### **Subcommittee Discussion**

A question was asked by Member Shack concerning the continued use of a lubricant on bolts that had molydisulfide. Mr. Guerrero of APS responded that they were indeed still using the lubricant, but were committed to replacing that lubricant with a graphite based lubricant. (Open Transcript Pages 34 - 36).

### **Subcommittee Discussion**

A question was asked by Chairman Bonaca concerning Coolant Usage factor (CUF). Chairman Bonaca wanted to know why was the CUF for Instrument Nozzles in Unit 1 was five times greater than for Units 2 and 3? Mr. Lynch of APS responded that the difference was due to the modeling and how it dealt with vortex shedding. Member Armijo responded that he would like for the applicant to elaborate, because the units were all of the same design, so it had to be more than just vortex shedding. Mr. Lynch of APS responded that the engineer decided to analyze each vibration caused by flow as a cycle, which caused a large increase in the number of cycles, which drove the usage factor higher. Chairman Bonaca inquired why the same analysis wasn't applied to the other units for consistency. Mr. Schaller of APS responded that there was not any difference between the plants from a design or materials perspective. He explained that the differences were made in the assumptions between the analyst assumptions. Both were produced under an Appendix B program and a Quality Assurance program. Mr. Radspinner of APS responded that the analyst that performed the analysis for Unit 1 wanted to make sure that he had a conservative treatment of vortex shedding and the method he used to superimpose those mechanical excitations onto thermal fatigue cycles in the most conservative manner. (Open Transcript Pages 50 - 53).

### **Subcommittee Discussion**

A question was asked by Chairman Bonaca concerning the frequency of structural monitoring for the current licensing period. Chairman Bonaca stated that, essentially the requirement seems to be that internal containment and external surfaces should be inspected once every five years, and internal surfaces should be inspected every ten years. But really what was done was that you inspected only part of the internal after ten years, and then another part of Unit 2 after ten years. But in 30 years of plant operation, the plant hasn't been fully inspected. Chairman Bonaca wanted an explanation of the frequency of the inspections. Mr. Schrecker of APS explained that by the year 2015 the licensee would complete the first inspection of all PVNGS structures that are included in the monitoring program for all three units. Between 2015 and 2025, PVNGS will perform another complete inspection of the entire plant. Chairman Bonaca asked a follow-up question about the 5 year inspection of the internal surface of the containment liner. Mr. Schrecker of APS responded that they are going to be inspecting structure on a 10 year periodicity in the current license. (Open Transcript Pages 60 - 64).

### **Subcommittee Discussion**

A question was asked by Chairman Bonaca regarding inaccessible cables. Chairman Bonaca questioned the acceptability of two year inspection considering that water was discovered in some manhole during inspections. Mr. Hypse of APS responded that when water is discovered in the manholes, water is pumped out of the manholes and a condition report is issued. APS Engineering then performs an inspection of the cables and manholes. He also explained that APS had a preventative maintenance (PM) program in place that had two components: 1) the program inspects the manholes every six months and, 2) the manholes are inspected when it rains more than .3 inches in 24 hour period. Mr. Hypse also explained the difference between the six month inspection frequency and the two year inspection frequency. The six month inspection frequency is for manholes that are in the "rain PM," and the two year frequency is for manholes that are dry. (Open Transcript Pages 64 - 69).

### **APS Presentation on Confirmatory Items**

Mr. A. Krainik of APS, discussed the application of the scoping criteria for the spray chemical addition tanks. She explained that APS had originally scoped the spray chemical addition tanks into the scope of license renewal and removed it because it was an abandoned system. They became aware that there was a small amount of liquid that remained in the system. They made a commitment to drain the spray chemical addition tank by November 30, 2010. (Open Transcript Pages 75 - 77) and (APS Slides entitled, "*Palo Verde Nuclear Generating Station, ACRS License Renewal Subcommittee*, September 8, 2010," Page 31).

### **Subcommittee Discussion**

A question was asked by Member Stetkar concerning the Flow-Accelerated Corrosion Program. Member Stetkar stated that the high pressure safety injection system piping for all three units where the plant had experienced flow-accelerated corrosion leaks, and that the applicant was now replacing the piping every seven years, and that he thought that was a strange way to get around the problem. Ms. Krainik of APS responded that the piping was within the scope of license renewal, but they were doing routine replacements of the piping. Chairman Bonaca then asked what analyses had been performed to show that those were the only sections of pipe susceptible to that type of flow-accelerated corrosion. Mr. Radspinner of APS responded that they had used EPRI methodology for anticipating damaging or incipient cavitation. (Open Transcript Pages 77 - 79) and (APS Slides entitled, "*Palo Verde Nuclear Generating Station, ACRS License Renewal Subcommittee*, September 8, 2010," Page 31).

### **Subcommittee Discussion**

A question was asked by Chairman Bonaca concerning small bore piping. Chairman Bonaca stated that the applicant had found two welds on small bore piping that had failed, and now the applicant had committed to inspect 10 percent of those welds. Chairman Bonaca wanted to know was the inspection performed a one-time inspection or a periodic inspection. Ms. Krainik of APS responded that the inspection was a one-time inspection. Chairman Bonaca then asked a question what was the number of ten percent of the socket welds. Ms. Krainik of APS responded that 320 per unit, or about 32 welds. (Open Transcript Pages 82 - 83)

### **NRC Overview**

Mr. Brian Holian, Division Director for the Division of License Renewal in the office of Nuclear Reactor Regulation (NRR), provided a brief overview of the reasons for today's Subcommittee meeting and introduced the presenters from the NRC. Mr. Holian explained the 71003 inspection program during the NRC introduction. (Open Transcript Pages 95 - 100).

## **NRC Presentation, Division of License Renewal**

Mr. Lisa Regner, Project Manager, NRC, began her presentation with a brief overview of the scope of the presentation. Ms. Regner stated that the Palo Verde application was not initially accepted by the NRC staff because it lacked complete information on the cumulative usage factor (CUF) for certain ASME Class 1 valves. Once the applicant submitted a supplement with the necessary information, the staff began its review. She also stated that the staff did evaluate the effects of the steam generator replacement and power uprate on several time-limited aging analyses (TLAA), such as reactor vessel neutron embrittlement analysis, leak before break analysis, and ASME-3 fatigue analysis of Class 1 vessels, piping and components.

Ms. Regner noted that the Safety Evaluation Report (SER) contained one open item and five confirmatory items. There were two audits and one inspection associated with the license renewal application. During the Scoping and Screening review, the staff identified several scoping concerns that resulted in amendments. She also noted that over 50 aging management review items were added to the license renewal application. The majority of the items were in the balance of plant systems. In the area of scoping, one confirmatory item pertaining to draining of the containment spray chemical addition tanks remained outstanding. Ms. Regner stated that the staff reviewed 40 aging management programs and over 2500 aging management review items. This included 29 existing programs and 11 new programs. (Open Transcript Pages 100 - 155), (NRC Slides entitled, "*Advisory Committee on Reactor Safeguards (ACRS) License Renewal Subcommittee Palo Verde Nuclear Generating Station Safety Evaluation Report with Open Item, September 8, 2010,*" Pages 1 - 22).

### **Subcommittee Discussion**

Member Stetkar asked a question about why the applicant screened out fire protection systems for a number of in-scope outdoor transformers, high voltage transformers, and even medium voltage transformers. He wanted an explanation as to why it was okay to not include fire protection for the transformers. Mr. O'Keefe of the NRC responded that Member Stetkar was mixing initiating events, and that if there was a fire in one of the transformers, then the plant has the ability to power the equipment they need to safely shut down the plant and that fire protection was always about spatial relationships. (Open Transcript Pages 107 - 110)

### **NRC Presentation, Region IV**

Mr. Greg Pick, Lead Inspector from Region IV gave an overview of the results of the Regional Inspection. The inspection team consisted of two generalists, an electrical engineer, a civil engineer, and a mechanical engineer. They looked at 26 of the aging management programs, which included 5 of the new aging management programs. The inspections focused on conditions at the plant and how the applicant implemented existing aging management programs. He indicated that they found that the applicant's scoping of structures and components thorough and generally accurate. During the field walkdowns, they found some pressure transmitters and other items that were not evaluated and the applicant had not included in their review. The applicant responded that they would fall back on the preventative approach and include them all in the scope of aging management review. For the current licensing basis, the applicant will have two complete 100 percent inspections prior to entering the period of extended operation. The inspection team found this response acceptable. Mr. Pick stated that for inaccessible medium voltage cables, the applicant stated that most of their water source is following rainfall. The inspection team identified a typo in the procedure where the applicant stated that they needed three inches of rainfall in a 24 hour period, but the correct amount was .3 inches of rain. The inspection team also reviewed an unresolved item in the inspection report that dealt with the review of their bus duct failure from review of the root cause. Mr. Pike also stated that the inspection team did not have an opportunity to go inside of the containment, but he did speak to a former resident inspector that stated the interior of the

containment was in good condition, no spalling, no rust, and no delamination of the coatings. (Open Transcript Pages 112 - 123), (NRC Slides entitled, "Advisory Committee on Reactor Safeguards (ACRS) License Renewal Subcommittee Palo Verde Nuclear Generating Station Safety Evaluation Report with Open Item, September 8, 2010," Pages 10 - 13).

**Subcommittee Discussion**

Member Stetkar asked a question about the NRC staff's consistency in handling volumetric examinations. For the Palo Verde application, he noted that even though the Palo Verde sample was large, was a one-time inspection adequate, regardless of the sample size. Mr. Hiser of the NRC responded that it came down to plant operating experience and plants that have a history of failures. Mr. Hiser Stated that Palo Verde had two failures and three design changes and the problems had been remediated. He also stated that if they had a sample size of ten percent, and if they performed 100 inspections, if problems were found in those welds, they would revert to a periodic inspection program. (Open Transcript Pages 132 - 133)

**SUBCOMMITTEE CONCLUSIONS**

Chairman Bonaca concluded the meeting by thanking the staff and the applicant. He stated that the presentations were informative. The meeting was adjourned at 4:52 pm.

**REFERENCES**

- 1) None

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**NOTE:**

Additional details of this meeting can be obtained from a transcript of this meeting available in the NRC Public Document Room, One White Flint North, 11555 Rockville Pike, Rockville, MD, (301) 415-7000, downloading or view on the Internet at <http://www.nrc.gov/reading-rm/doc-collections/acrs/> or it can be purchased from Neal R. Gross and Co., 1323 Rhode Island Avenue, NW, Washington, D.C. 20005, (202) 234-4433 (voice), (202) 387-7330 (fax), [nrgross@nealgross.com](mailto:nrgross@nealgross.com) (e-mail).

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
 SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

September 8, 2010  
 Date

NRC STAFF SIGN IN FOR ACRS MEETING

PLEASE PRINT

<u>NAME</u>	<u>NRC ORGANIZATION</u>
1 ED SMITH	NRR/ASS/SIBIB
2 CLIPP DOVIT	NRR/DLR/NRSTB
3 JAMES MEDOFF	NRR/DLR/PARB
4 ABDUL SHEIKH	NRR/DLR/RASB
5 John TSAO	NRR/DCI/CPNB
6 E Gettys	NRR/DLR
7 DUC NGUYEN	NRR/DLR
8 Bart Fu	NRR/DLR
9 Robert Sun	NRR/DLR
10 Simon Sherg	NRR/DCI/CVIB
11 Michelle Kichilme	NRR/DLR
12 William Helston	NRR/DLR
13 DAVID PELTON	NRR/DLR
14 Neil O'Keefe	RIV/DAS
15 Gregory Pick	RIV/PRS/EBZ
16 USA REGNER	NRR/DLR
17 Brian Hovian	NRR/DLR
18 DAVID WRONA	NRR/DLR
19 Jerry Dozier	NRR/DLR
20 John Daily	NRR/DLR
21 Allen Hiser	NRR/DLR
22 Keny Miller	NRR/DE/EEEB
23 Sergiu Basturca	NRR/DE/EEEB
24 Daniel Doyle	NRR/DLR
25 Tim Lupold	NRR/DCI/CPNB
26 DON BRITNER	NRR/DLR/PARB
27 <del>XXXXXXXXXXXX</del> 9/8/10	
28 Ching Ng	NRR/DLR

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

September 8, 2010  
Date

**NRC STAFF SIGN IN FOR ACRS MEETING**

**PLEASE PRINT**

	<u>NAME</u>	<u>NRC ORGANIZATION</u>
1	WILKINS SMITH	NRR/DLR/RAPB
2	Beth Keighley	NRR/DLR/RAPB
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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
 PLANT LICENSE RENEWAL SUBCOMMITTEE MEETING

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TODAY'S DATE: September 8, 2010

<u>NAME</u>	<u>AFFILIATION</u>
Michael Green	APS
Mark Fallon	APS
Michael Berg	STP Nuclear Operating Company
Loyd Wright	SCE
RON BARNES	APS
Chalmer Myer	STARS
SHABIR PITTALWALA	APS
Philippe Soenen	PG&E
Michelle Albright	SCE
DAVID G. WONG	PG&E
MEG WONG	PUBLIC
Sarah Kovaleski	AmerenUE
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Rex Meeden	APS
Curtis Carney	Structural Integrity Assoc.
Donald Lynch	STARS
Thomas Gray	APS
Winston G. Berzovero	APS
DOUG BERLE	APS
Eugene Montgomery	APS
Glenn Michael	APS
MARIC HYPSE	APS
D. HANSEN	APS
ROBERT C. BEAN	PSEG Nuclear
John Hufnagel	Bexelon

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
PLANT LICENSE RENEWAL SUBCOMMITTEE MEETING

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TODAY'S DATE: September 8, 2010

	<u>NAME</u>	<u>AFFILIATION</u>
1	Raj Auluck	NRC/DLR
2	Dan Naus	ORNL
3	Dominic Macedonia	APS
4	Kenneth Schrecker	APS
5	Youp Coxon	APS
6	Jorge Rodriguez	APS
7	Jason Bluner	APS
8	Brian Cable	APS
9	Zouhair Elawar	APS
10	PAUL L BURL	APS
11	Seung MIN	NRC
12	Rachel VAUCHER	NRC
13	Jenny HAROLD	STAR5 Alliance
14	Lauren Gibson	NRC
15	Carmen Fells	NRC
16	ABBAS MOSTALA	COLUMBIA GEN STATION
17	On Yee	NRC
18	Andrew Toljson	NRC
19	ALBERT HONG	NRC
20	Hansraj Asher	NRC
21	Andrew Primaris	NRC
22	Don BRITNER	NRC
23	DAVID DRUKER	NRC
24	Doug Steinsiek	APS
25	Allison Bassett	APS
26	David Van Allen	APS
27	CHRIS WANDER	APS
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