

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

E. Roy Hawkens, Chair

Dr. Paul B. Abramson

Dr. Anthony J. Baratta

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In the Matter of	)	May 7, 2007
AMERGEN ENERGY COMPANY, LLC	)	
	)	Docket No. 50-0219-LR
(License Renewal for the Oyster Creek	)	
Nuclear Generating Station)	)	
_____	)	

**CITIZENS' RESPONSE TO NRC STAFF**

**INTRODUCTION**

Nuclear Information and Resource Service, Jersey Shore Nuclear Watch, Inc., Grandmothers, Mothers and More for Energy Safety, New Jersey Public Interest Research Group, New Jersey Sierra Club, and New Jersey Environmental Federation (collectively "Citizens" or "Petitioners") oppose the summary disposition motion (the "Motion") filed by AmerGen Energy Co. LLC ("AmerGen") on legal and factual grounds.

In response to AmerGen, Nuclear Regulatory Commission Staff ("NRC Staff" or Staff") submitted a brief containing new arguments supported by two affidavits. In accordance with 10 C.F.R. § 2.1205(c) and 10 C.F.R. § 2.710 (a), Citizens are responding to the new arguments presented in Staff's brief and the key facts presented in the affidavits.

## ARGUMENT

For the first time, NRC Staff clearly set forth the material facts that AmerGen and Staff must show are not in dispute for the Atomic Safety and Licensing Board ( the “ASLB” or “Board”) to grant summary disposition. NRC Staff Answer at 9-10. However, Staff failed to show that there is no dispute about these facts. In fact, as this response demonstrates in detail, four of eight material facts set forth by Staff are in dispute.<sup>1</sup> By definition, each material fact could have a significant effect on the outcome of this proceeding. Because four of these facts are disputed, summary disposition is not appropriate at this time.

### **I. Material Facts In Dispute**

#### **A. The Local Area Acceptance Criterion Is In Dispute**

Staff assert that the local acceptance criterion allows an area of the drywell shell of up to one square foot to have an average thickness greater than 0.536 inches. NRC Staff Answer at 9, 11 *citing* Affidavit of H.G. Ashar, dated April 26, 2007 (“Ashar Aff.”) at ¶ 3. According to Staff, such an area may be surrounded by a one foot long transition zone to an average thickness of 0.736 inches. *Id.* However, neither the text of the affidavit, nor the citation provided, adequately support this factual assertion.

The text of the affidavit is ambiguous about the local area acceptance criterion. In addition to stating the 0.536 inch criterion, it also notes that “AmerGen has elected to use a thickness of 0.636 inch to characterize the extent of degradation.” Ashar Aff. at ¶ 3. Thus, the text of the affidavit is unclear whether the applicable local area acceptance criterion is 0.536 inches or 0.636 inches.

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<sup>1</sup> Citizens also disagree with Staff’s assertion that corrosion has been arrested, Staff Answer at 9, but do not regard this dispute as material, because the contention hinges on the current state of the drywell and the potential for future corrosion.

The support relied upon by Mr. Ashar reveals the source of this ambiguity. The pages of the report he cites discuss a modeling exercise conducted by General Electric. AmerGen Ex. 3 at 10-11. This exercise showed that a uniform thickness of 0.736 inches in the sandbed region, with small areas thinner than 0.736 inches, would not meet ASME requirements by differing margins. *Id.* The exercise did not derive acceptance criteria. Thus, the cited section of the report, which merely summarizes this exercise, does not establish a local area acceptance criterion at all.

Indeed, in the very report cited by Mr. Ashar, AmerGen actually used a local area acceptance criterion that required 12 inch square areas to have an average thickness of 0.636 inches or more. *Id.* at 5. Furthermore, Citizens showed in detail in their Answer dated April 26, 2007 (“Citizen’s Answer”) that AmerGen has recently made the local area acceptance criterion more stringent. Citizen’s Answer at 6-7. Thus, NRC Staff’s Answer confirms that there is a material factual dispute about the local area acceptance criterion that is being used.

**B. The State Of The Epoxy Coating Is In Dispute**

Relying on affidavits supplied by AmerGen, NRC Staff allege that the inspections in 2006 did not reveal any defects in the epoxy coating. NRC Staff Answer at 9. This is incorrect, because epoxy was applied to the shell in the sandbed region in two different ways. For most of the shell, a multi-layer coating was painted onto the metal of the drywell. However, for a small portion of the shell just above the uneven concrete floor of the sandbed region, it was covered by epoxy poured upon the floor to direct any water reaching the sandbed region away from the drywell shell and into the drains. The epoxy coating on the floor was poured before the epoxy was painted on the rest of the drywell shell. *See* Photograph of “Bay 5 before shell coating” provided by AmerGen as reference material to the ACRS (attached as Ex. SJA 3 for ease of

reference). Thus, portions of the shell above the sandbed concrete floor, but below the level of the epoxy coating applied to the floor, are protected only by the epoxy coating on the floor.

Since 1996, inspections have found that the epoxy coating on the floor was separating from the concrete underneath. Ex. ANC 5 at 1. The latest inspections showed separated seams and voids in Bays 1, 7, 9, 15. *Id.* Thus, NRC Staff is incorrect when it alleges that no coating defects have been identified. These defects meant that water could have penetrated the epoxy coating on the floor prior to its repair. *Id.* at 2. That water could have flowed to the lower parts of the drywell shell in the sandbed region, potentially causing further corrosion.

### **C. The Margins Are In Dispute**

NRC Staff allege that the bounding general thickness is 0.800 inches in Bay 9, leaving a margin of 0.064 inches, and the bounding local average thickness is 0.618 inches, leaving a margin of 0.082 inches. NRC Staff Br. at 10; Ashar Aff. at ¶¶4-5. In fact, the actual margins are much lower than Staff assert because the bounding thicknesses are considerably thinner than those provided, the assessments take no account of uncertainty, and the local area acceptance criterion is incorrectly stated.

AmerGen has admitted that the minimum general thickness measured in 1992 was 0.792 inches in Bay 11. AmerGen Ex. 3 at 5. In addition, Citizens have showed that using the latest external results yields an average measured thickness of 0.783 inches for Bay 11. Citizens Answer at 10. Taking account of uncertainty, assuming Gaussian statistics, Citizens showed that the lower ninety five percent confidence interval of this mean is 0.750 inches. Citizens Answer at 11. Thus, the margin derived from the average of the external readings in Bay 11 is 0.014 inches at ninety five percent confidence.

Turning to the local areas, Staff's margin estimate is incorrect for a number of reasons. Most obviously, the 2006 results showed that thinnest local area is 0.602 inches thick, Ex. SJA 2,

Attachment 4 at 14, not 0.618 inches as Mr. Ashar alleges. There is no dispute that this area is located at point 7 in Bay 13. *Id.* However, Mr. Ashar appears to be erroneously quoting the 1992 result at this point in his affidavit. *Compare id.* with Ashar Aff. at ¶ 4. The area that this point represents was stated to be around 6 inches by 6 inches. AmerGen Ex. 3 at 36. Even without taking account of uncertainty, both the 1992 result and the 2006 result appear to violate the latest statement of the local area acceptance criterion. Citizens' Answer at 12.

Taking account of uncertainty, Dr. Hausler states that single measurements may be uncertain by 0.04 inches. Memorandum of Dr. R.H. Hauler, dated April 25, 2007 at 9. Thus, the lower confidence interval of the thickness of the thinnest measured area is 0.562 inches. This violates the local area acceptance criteria that have been used most recently. Furthermore, even if Mr. Ashar were correct concerning the local area acceptance criterion and the means of comparing the UT results to that criterion, the margin from the alleged 0.536 inch local acceptance criterion would only be 0.030 inches at ninety five percent confidence.<sup>2</sup>

#### **D. Future Corrosion Is A Reasonable Possibility**

NRC Staff argues that it is speculative to assume that water could enter the exterior of the drywell in the future. NRC Staff Answer at 10. This is incorrect. Most obviously, operating experience shows that much water entered the sandbed region. For example, AmerGen found water in the sandbed drains as recently as March 2006. Letter from Conte to Webster, dated November 9, 2005 *available at* ML063130465. The source of this water was not determined. *Id.* Thus, it has not been established that the only source of water is the reactor fueling cavity. Indeed, Citizens have recently seen documents that indicate that some of the water in the

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<sup>2</sup> Here Citizens are using Gaussian statistics for simplicity. However, Citizens caution that this approach overstates the actual confidence in the margin, because it assumes that AmerGen has actually measured the thinnest point in the sandbed region. Because only a partial visual scan of the sandbed was used to select the points for external monitoring, this is unlikely.

sandbed came from the spent fuel pool. In addition, some water could result from condensation during outages. Moreover, AmerGen has admitted that it has not yet devised a means of preventing the reactor fueling cavity from leaking. Transcript from ACRS Meeting on Feb. 1, 2007 at 217-222. Thus, it is entirely reasonable for all parties to assume that water may enter the exterior of the sandbed region during any extended period of licensed operation.

NRC's coatings expert further states that no deterioration in the coating would be expected without mechanical impacts or exposure to ultraviolet light. Affidavit of James A. David, PhD. at ¶ 7. However, he offers no support for this opinion, factual or otherwise. Such bare assertions are insufficient to foreclose a factual dispute. *See AmerGen Motion For Summary Disposition* at 23 (expert opinion must be shown to be grounded in fact at summary disposition stage). In addition, this assertion has been contradicted by AmerGen, which has admitted that the epoxy coating has a limited life of between 10 and 20 years. Transcript of ACRS meeting on October 3, 2006 at 61:12-22. The coating was applied in 1992 and is now around 15 years old. Thus, it is reasonable to assume that the coating could fail at any time during any extended period of operation

AmerGen has also stated that it electrically tested the coating applied to a mock up of the drywell shell for non-visible pinholes. Transcript of ACRS meeting on February 2, 2007 at 151. However, AmerGen inexplicably failed to monitor the actual coating in a similar way and merely relied on visual inspection. Transcript of ACRS meeting on October 3, 2006 at 60:20-61:2. Thus, it is also possible that water could enter through pinholes in the coating and corrosion could develop from there.

Moreover, AmerGen and the NRC have both found that water on the interior of the drywell could lead to some additional corrosion. Citizens' Answer at 13. Although AmerGen

believes the rate of interior corrosion will generally be small, New Jersey has recently written to NRC providing cautionary expert comments. Letter from Lipoti to Kuo, dated April 26, 2007 attaching letter from R.M. Latanision, dated March 26, 2006. Mr. Latanision, an expert retained by New Jersey, warned that interior corrosion could accelerate in the future. He therefore suggested that real time monitoring of the thickness of the drywell at the thinnest spots should be considered. *Id.*

Finally, NRC Staff suggest that Dr. Hausler is not qualified to opine on the inspection of coatings. NRC Staff Answer at 11. This assertion is contradicted by his previous sound advice on coating testing, stating that electrical testing of the coating was required before AmerGen revealed that the mock-up coating had been tested electrically. Memorandum of Dr. R. H. Hausler, dated July 25, 2006 at 5-6, attached to Supplement To Petition To Add A New Contention, dated July 25, 2006. In addition, when Citizens supplied information about the experience upon which Dr. Hausler is relying to give his opinions, his experience in failure analysis of coated tubular pipes was specifically mentioned. Ex. SJA 4. Thus, Dr. Hausler is fully qualified to comment on coating inspection and failure.

## **II. Consequences Of The Material Disputes**

NRC Staff have based their conclusions about the adequacy of the frequency of UT monitoring on overly optimistic assessments of the available margin and the potential for future corrosion. The monitoring frequency, which is ultimately at issue in this proceeding, depends on a comparison of the potential future corrosion rate with the available margin. At present, because both the available margin and the potential for future corrosion are in dispute, summary disposition on the appropriate monitoring frequency would be grossly premature.

**CONCLUSION**

For the foregoing additional reasons, the ASLB should dismiss AmerGen's Motion for Summary Disposition.

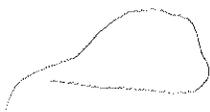
Respectfully submitted



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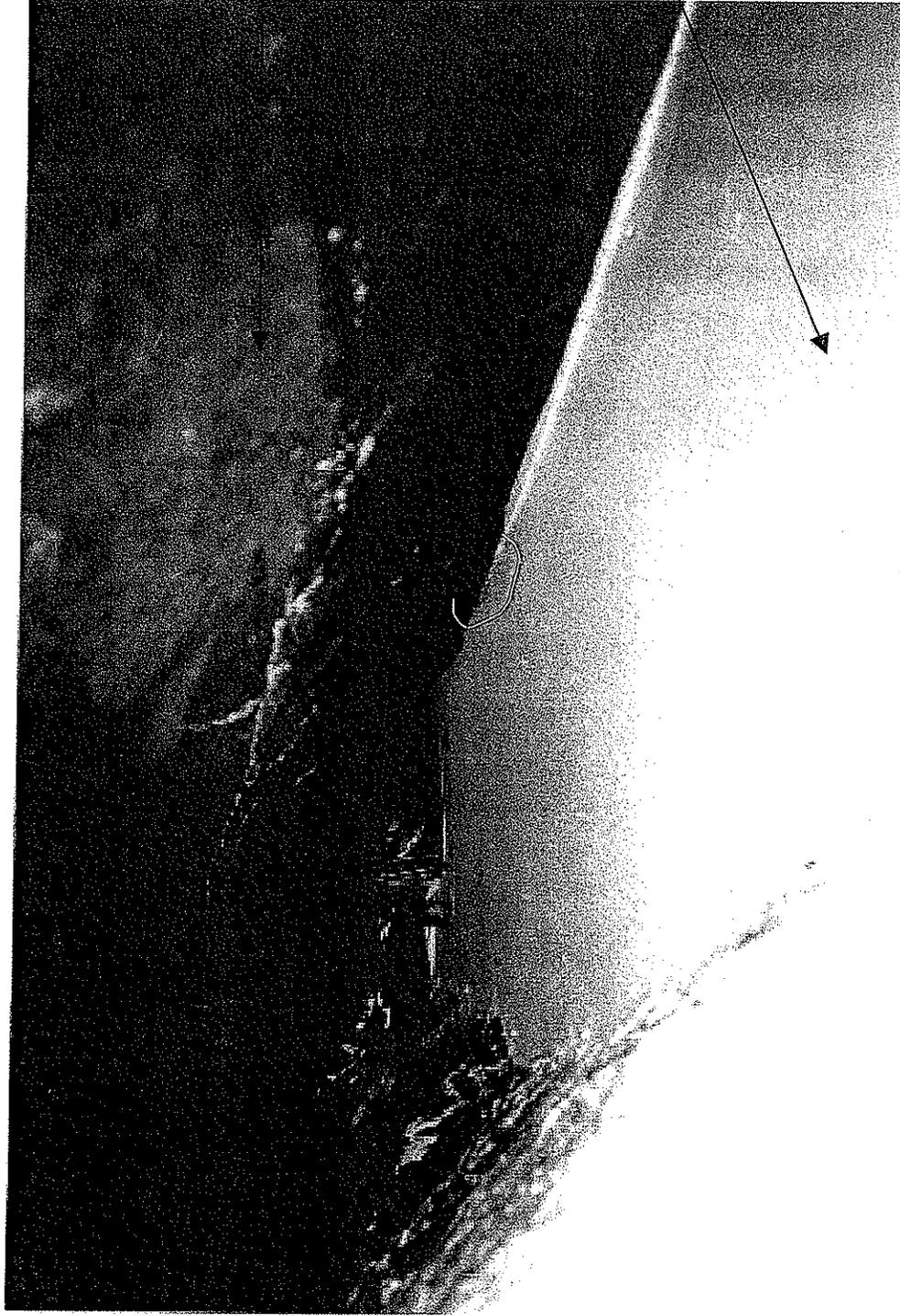
Richard Webster, Esq  
RUTGERS ENVIRONMENTAL LAW  
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Attorneys for Citizens

Dated: May 7, 2007



**EXHIBIT SJA 3**

## Sand Bed Region 1992



Bay 5 before shell coating

**EXHIBIT SJA 4**

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In the Matter of	)	
	)	Docket No. 50-0219-LR
AMERGEN ENERGY COMPANY, LLC	)	
	)	ASLB No. 06-844-01-LR
(License Renewal for the Oyster Creek	)	
Nuclear Generating Station)	)	November 14, 2006

**Citizens' Response to 10 C.F.R. § 2.336(a)(1)**

Citizens based the contention in part on the opinions of an expert on corrosion, Dr. R.H. Hausler, and experts on structural engineering, Richard C. Biel, P.E. and J. Kirk Brownlee, P.E. These opinions have all been submitted to the Atomic Safety and Licensing Board and have been served upon all parties in this proceeding. The submitted opinions include contact details for the named individuals.

**Documents on which the opinions of Dr. R.H. Hausler are based include:**

All those previously disclosed in this proceeding on April 3, 2006 and:

AmerGen's Commitment Letters dated December 9, 2005, April 4, 2006 and June 20, 2006.

Exhibits Presented by Citizens in the Petition to Add a Contention and Supplement thereof.

**Additional Information**

The opinions in the various memoranda produced by Dr. Hausler were also based on experience gained during his career; specifically experience regarding failure analysis of coated tubulars (production tubing, pipelines) and with statistical methodologies, such as Extreme Value Statistics. For example:

Title: Blistered Coating from CO<sub>2</sub> Injection Wells; June 12, 1995, (Mobil Exploration and Producing Technical Center)  
Document Date: June 12, 1995

Title: Paper presented at NACE CORROSION/96 No 96-0024: Corrosion management in the Arun Field  
Document Date: March 1996

**Documents on which the opinions of Messrs Biel and Brownlee are based include:**

ASME Boiler and Pressure Vessel Code

AmerGen's Commitment Letters dated December 9, 2005, April 4, 2006 and June 20, 2006.

Transcript of June 1, 2006 meeting between AmerGen and NRC

An ASME Section VIII Evaluation of Oyster Creek Drywell for Without Sand Case, Part I, Stress Analysis, GE Nuclear Energy, February 1991

GPU Calculation No. C-1302-187-5320-024, dated April 16, 1993

Oyster Creek, License Renewal AMP-AMR Audit Questions AMP-210 Set 2, ML060960568, April 7, 2006

Oyster Creek, License Renewal AMP-AMR Audit Questions AMP-210 Set 3. ML060960602, April 7, 2006

Oyster Creek, License Renewal AMP-AMR Audit Questions update to AMP Question AMP-141, ML061030419, April 12, 2006

Oyster Creek, License Renewal AMP-AMR Audit Questions AMP-141, AMP-356, AMP-210 Set 1 and Cover Email, ML060960563, April 7, 2006

Email: Questions to go over tomorrow (PD), ML061500442, April 24, 2006

**Additional Information**

The Memorandum from Messrs Biel and Brownlee was also based on experience gained during their careers.

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BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY

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	)	ASLB No. 06-844-01-LR
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Nuclear Generating Station)	)	May 7, 2007
	)	

CERTIFICATE OF SERVICE

I, Richard Webster, of full age, certify as follows:

I hereby certify that on May 7, 2007, I caused Citizens response to NRC Staff's Answer regarding summary disposition to be served via email and U.S. Postal Service on the following:

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Richard Webster

Dated: May 7, 2007