

November 14, 2005 (5:00pm)

OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

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November 14, 2005

VIA FEDERAL EXPRESS

Annette L. Vietti-Cook, Secretary  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Request for Hearing and Petition to Intervene

Dear Madam Secretary:

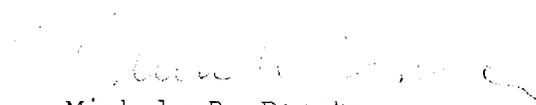
On behalf of Nuclear Information and Resource Service, Jersey Shore Nuclear Watch, the New Jersey Public Interest Research Group, the New Jersey Environmental Federation, Grammies, the New Jersey Sierra Club, I am enclosing an original and one copy of the following:

1. Request for hearing and petition to intervene with Certificate of Service and Notices of Appearance;
2. Declarations for each of the Petitioners;
3. Affidavit of Dr. Rudolf H. Hausler, President, Corro-Consulta; and

The exhibits are being posted this day and will be delivered by separate cover. In addition, these documents are being filed electronically. Please file these documents and take appropriate steps to assure that this request for hearing and petition is processed in accordance with the Code of Federal Regulations.

If you have any questions or problems with regard to this petition, please advise immediately. Otherwise, I await your confirmation as to the receipt of this information and its filing. Thank you.

Very truly yours,

  
Michele R. Donato

MRD:dp

Encs.

cc: (by VIA EMAIL TRANSMISSION ONLY)  
Nuclear Information and Resource Service  
Jersey Shore Nuclear Watch  
New Jersey Public Interest Research Group  
New Jersey Environmental Federation (with encs.)  
The New Jersey Sierra Club (with encs.)

UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY

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In the Matter of	)	
AMERICAN ENERGY COMPANY,LLC (ALSO KNOWN AS AMERGEN)	)	Docket No. 50-0219
OYSTER CREEK NUCLEAR GENERATING STATION	)	
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	NOVEMBER 14, 2005

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REQUEST FOR HEARING AND PETITION TO INTERVENE

Now come Nuclear Information and Resource Service, Jersey Shore Nuclear Watch, Inc. Grandmother, Mothers and More for Energy Safety, New Jersey Public Interest Research Group, New Jersey Sierra Club and the New Jersey Environmental Federation hereafter referred to as the Petitioners, hereby make their REQUEST FOR HEARING AND PETITION TO INTERVENE in the above captioned matter, pursuant to the Federal Register Notice of September 15, 2005 [Volume 70, Number 178, Page 54585-54586] and in accordance with the provisions of 10 CFR § 2.714 and § 2.309.

In support of their Request and Petition, said Petitioners as Intervenors further state as follows:

1. Nuclear Information and Resource Service (NIRS) is a nonprofit corporation with over 6000 members, a number of whom live within the State of New Jersey of whom make their residences and places of occupation and recreation within fifty (50) miles of Oyster Creek nuclear generating station (hereinafter referred to as "Oyster Creek"). The central office of NIRS is located at 1424 16<sup>th</sup> Street NW Suite 404, Washington, DC 20036.

2. Jersey Shore Nuclear Watch, Inc. is a citizen organization located at 364 Costa Mesa

Drive. Toms River, New Jersey 08757 with more than 900 supporters who live within the fifty (50) mile radius of the Emergency Planning Zone of Oyster Creek.

3 Grandmothers, Mothers, and More for Energy Safety is an organization of concerned citizens within the emergency planning zone of the Oyster Creek nuclear generation station . There one hundred and fifty members who either reside, recreate or are employed within the 50 mile emergency planning zone. GRAMMIES is located in Ocean County at 747 Bay Avenue, Brick, New Jersey 08724

4. New Jersey Sierra Club is located at 139 West Hanover Street, Trenton New Jersey 08618. The New Jersey chapter has approximately 23,000 members statewide a number of reside, recreate and work within the 50 mile emergency planning zone for Oyster Creek.

5 New Jersey Environmental Federation is a non-profit organization that is part Clean Water Action with 110,000 members in New Jersey and 90 member groups. The main office is at 1002 Ocean Avenue, Belmar, New Jersey 07319.

6 New Jersey Public Interest Research Group (NJPIRG) is located at 11 N. Willow St, Trenton, NJ 08608. NJPIRG is a statewide, non-partisan, non-profit, public interest organization with a thirty-three year history of representing both environmental and consumer interests. NJPIRG has 25,000 citizen members, many of whom live within the 50-mile radius of the Oyster Creek nuclear power station.

7. The Declarations of members and supporters are annexed to this Request for a Hearing and Petition to Intervene, with each individual declarant identifying his or her affiliation with each of the petitioning organizations.

8. Petitioners, as organization intervenors, believe that their members' interests will not be adequately represented without this action to intervene, and without the opportunity to participate as full parties in this proceeding. If the Oyster Creek license is extended

without first resolving the Petitioners'-Intervenors' safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment and jeopardize the health, safety and welfare of the respective Petitioners' members who live, recreate, and conduct business within the vicinity of the nuclear power station.

**Contention of the Petitioners regarding the drywell liner corrosion management program for the 20-year license extension of the Oyster Creek nuclear generating station**

The Petitioners contend that the licensee's application is significantly deficient by failing to adequately and reasonably assure the continued integrity for the requested twenty (20) year license extension for the safety-related containment component, the drywell liner or drywell shell, by providing confirmatory ultrasonic testing (UT) measurements at all critical areas of the known degraded component to determine the actual remaining wall thickness of the vitally important containment component. Petitioners contend that failing to do so unreasonably jeopardizes the health and safety of the Petitioners' members. The Petitioners therefore contend that as part of this licensing proceeding that the applicant be required to conduct an adequate number of confirmatory UT measurements using state of the art equipment at all levels of the drywell liner, including multiple measurements at the area formerly known as the "sand bed region" and also be required to submit the results to the United States Nuclear Regulatory Commission as publicly available documents as part of this license extension proceeding for the Petitioners' independent review and analysis. The Petitioners further contend that the applicant's new UT measurements at all critical areas, the NRC and the Petitioners' independent analysis shall concur with ASME standards governing the safety limitations of the known degraded drywell liner. The Petitioners further contend that the UT measurements be taken periodically for the life of the reactor at all critical levels of the drywell liner including the area formerly known as the "sand bed region" to include the requested 20-year extension to confirm that the actual corrosion measurements are as projected and that additional UT measurements be greatly expanded into areas not

previously inspected.

The General Electric Mark I Boiling Water Reactor's (GE Mark I BWR) primary containment system design consists of three large components; 1) the drywell liner; 2) the downcomer vent system and; 3) the torus or wet well. The downcomer vents are large diameter pipes connecting the drywell and the torus which is designed as a large pressure suppression chamber filled with approximately one million gallons of water. The drywell liner is a steel pressure vessel fabricated of ASTM A212 Grade B carbon plate steel in the shape of an inverted light bulb, with a spherical bottom section and an upper cylindrical section. The spherical section is partially embedded in reinforced concrete and transitions into the non-embedded section. The entire non-embedded portion of the drywell liner is enclosed by a reinforced concrete shield wall, separated by a gap or annulus of three inches which is designed to allow for expansion of the drywell liner. The drywell liner is painted on the interior with inorganic zinc and on the exterior with "red lead" identified as TT-P-86 C Type 1.

Both the United States Nuclear Regulatory Commission (NRC) and the applicant have identified the drywell liner as a safety-related structure to be maintained both as a pressure-related boundary and for structural support. It is required to contain and control the release of fission products to the Reactor Building in the event of a Design Basis Accident including a Loss-Of-Coolant-Accident (LOCA) so that the offsite radiation dose consequences to surrounding populations would be within the postulated acceptable limits.<sup>1</sup> Oyster Creek is the first licensed and oldest operating GE Mark I BWR in the United States. The drywell liner is therefore a primary structure where the assured integrity and design performance is vital to the protection of the health, safety and welfare of the Petitioners members.

On December 8, 1986, NRC Information Notice 86-99: Degradation of Steel Containments (IN 86-99) identified to the nuclear industry that the potential for corrosion of the drywell liner was first recognized in the United States at Oyster Creek in 1980 after

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<sup>1</sup> Oyster Creek Generating Station License Renewal Application, July 2005

water leakage was identified in the gap between the boiling water reactor's drywell liner and the concrete shield wall.<sup>2</sup> [Petitioners' Exhibit 1] The operator began investigation in 1983. The NRC information notice states that the water leakage was identified to be as much as 2 gallons per minute during refueling outages. Ultrasonic testing (UT) was performed on the drywell liner to determine if the leakage had caused damage to the steel containment. IN 86-99 states that investigations to identify the source of the water, at least from one source, observed leakage from the region above the drywell, which is flooded during refueling, to be coming from around bellows and a gasket located at the top of the drywell. There first appeared a loss of metal in a bathtub shaped ring of corrosion at the 11-foot 3-inch level on the gap side immediately above the concrete floor. In this area, the gap or annulus had been packed with sand and contained five equally spaced drain pipes. A trench was excavated in the concrete floor to reach the inside of the drywell liner. The operator made a total of 143 UT measurements at this level where 60 measurements indicated localized corrosion (pitting) with a reduction in the liner wall thickness of more than ¼ inch from the drawing thickness of 1.154 inches.

On February 19, 1991, NRC issued Information Notice 86-99, Supplement 1 that determined *"Since drywell corrosion was detected in 1986, the licensee instituted periodic wall thickness measurements by the ultrasonic testing (UT) technique to determine corrosion rates. The most severe corrosion was found in the sand bed region at a nominal elevation of 11'-3". The highest corrosion rate determined was 35.2 +/- 6.8 mils per year. To mitigate the corrosion in the sand bed region, water was drained from the sand bed and cathodic protection (CP) was installed in the bays with the greatest wall thinning in early 1989. Subsequent UT thickness measurements in these bays indicated that CP was ineffective... In the spherical portion of the drywell above the sand bed, the highest corrosion rate determined was 4.6 +/- 1.6 mils per year at a nominal elevation of 51'. In the cylindrical portion of the drywell above the spherical portion, where minor corrosion was discovered and thought to have originated mostly during construction, no significant wall thinning was detected (at a nominal elevation of 87'). However, this is the region in which the nominal thickness of wall thickness has the least*

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<sup>2</sup> IN 86-99: Degradation of Steel Containments, US NRC, December 8, 1986

*margin, thus requiring periodic monitoring of actual thickness.”<sup>3</sup> [PETITIONERS’ EXHIBIT 2] Information Notice 86-99 Sup 1 further states, “The licensee believes that a thorough program has been established for managing leakage that could affect drywell integrity due to corrosion from moisture ingress into the drywell gap. Recent surveillance of the sand bed drains indicates that the sand bed is free of water.”<sup>4</sup>*

Petitioners contend that this of course is nonsensical (as stated) because water will be retained in the pores of the sand bed by capillary forces and continued to support corrosion even though no drainage from the sand bed is observed]

However, the Petitioners note that contrary to the licensee’s assertions neither the leakage nor the corrosion was in fact arrested.

The Petitioners submit that NRC stated in its 1992 Safety Evaluation of Oyster Creek’s Drywell Integrity, *“In 1986 the steel drywell liner at Oyster Creek Nuclear Generating Station (OCNGS) was found to be extensively corroded in the area of the shell which is in contact with sand cushion around the bottom of the drywell. Since then GPU Nuclear (GPUN, the licensee of OCNGS), has instituted a program of periodic inspection of the drywell shell sand cushion area through ultrasonic testing (UT) thickness measurements. The inspection has been extended to other areas of the drywell and some areas above the sandbed region is continuing. In an attempt to eliminate corrosion or reduce the corrosion rate, the licensee tried cathodic protection and found to be of no avail. An examination of the results of consecutive UT measurements, confirmed that the corrosion is continuing. There is concern that the structural integrity of the drywell cannot be assured. Since the root cause of the corrosion in the sand bed region is the presence of water in the sand, the licensee has considered sand removal to be an important element in its program to eliminate the corrosion threat to the drywell integrity.”<sup>5</sup>*

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<sup>3</sup> Information Notice No. 86-99 Supplement 1: Degradation of Steel Containments, US NRC, February 14, 1991

<sup>4</sup> Ibid.

<sup>5</sup> Safety Evaluation by the Office of Nuclear Reactor Regulation, Drywell Structural Integrity, Oyster Creek Nuclear Generating Station, GPU Nuclear Corporation, United States Nuclear Regulatory Commission, April 24, 1992, Introduction.

**[PETITIONERS' EXHIBIT 3]**

The NRC Safety Evaluation noted on completion of their safety review and evaluation *“The stresses obtained for the case of reduced thickness can only be interpreted to represent those in the corroded areas and their adjacent regions of the drywell shell. In view of these observations, it is essential that GPUN continue UT thickness measurements at refueling outages and at outages of opportunity for the life of the plant. The measurements should cover not only the areas previously inspected but include accessible areas which have not been inspected so as to confirm that the thickness of the corroded areas are as predicted and the corroded areas are localized.”*<sup>6</sup>

The Petitioners contend that the emphasis in the staff finding, and its recommendation, that it is *“essential”* that GPUN continue UT testing *“for the life of the plant”* at not only previously inspected areas such as areas in the bathtub ring of severe corrosion around the sandbed region of the drywell, but other areas never inspected *“so as to confirm that the thickness of the corroded areas are as projected”*, be followed.

The Oyster Creek license extension application states at Section 3.5 1-13 that ASME Section XI Subsection IWE and 10 CFR 50 Appendix J will be used to manage loss of material for steel elements of the containment including the drywell liner. The application identifies that loss of material is considered in a Time Limited Aging Analysis (TLAA) and evaluated in accordance with 10 CFR 54.21(c). The application notes that *“Loss of material in the sand bed region and on the exterior surfaces of the upper region of the drywell was identified as a potential concern in the early 1980’s. As a result the sand was removed from the sand bed region and a protective coating was applied to the drywell exterior surfaces in that region. The upper regions of the drywell are examined by ultrasonic testing (UT) measurements and evaluated to ensure that the actual thickness meets ASME requirements.”*<sup>7</sup>

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<sup>6</sup> Ibid, page 5.

<sup>7</sup> Oyster Creek Generating Station License Renewal Application, July 2005

The Petitioners are concerned that the protective coating needed to be applied to the bathtub ring of corrosion area over the entire periphery of the outside of the drywell liner or only to the areas where in fact corrosion had been observed or accessible.

The applicant further states in Subsection 3.5.2.2.1.4 that the current normal operating temperature for the drywell varies from 139° F at the lower Elevation Level of 55 feet to 250° F at the higher Elevation Level of 95 feet.

The applicant states that the sand bed region was originally filled with dry sand per ASME 633. The purpose of the sand was to act as a cushion and allow expansion of the drywell during operation. The Petitioners note that the sand was originally installed to prevent buckling of the drywell liner at the transition from the free standing portion of the large and heavy steel component and the embedded portion at the base of the component.

The application states that leakage was observed from the sand bed drains as early as 1980 with mitigation efforts beginning in 1983. The application further states that it was concluded that the optimal method for arresting the corrosion was (1) removal of the sand to break up the galvanic cell; (2) removal of the corrosion from the drywell liner at the sand bed region and; (3) application of a protective coating. Removal of sand was started in 1988 by cutting access holes in the concrete shield wall and completed in 1992. The application states that core samples taken in seven locations of the dry well liner validated UT measurements and confirmed that the corrosion of the drywell liner was due to the presence of oxygenated wet sand and exacerbated by the presence of chloride and sulfate in the sand bed region. The application states that corrective actions taken at this time included cleaning loose rust from the drywell shell followed by an application of a coating of an epoxy material. The application then states that UT measurements were taken after cleaning. The application notes that “*There were, however, some areas thinner than projected*” but were still within ASME code requirements.

The Petitioners submit that in fact the margins of safety left by severe corrosion damage and compliance are extremely narrow. UT measurements were conducted by GPUN in

1993 on the remaining thickness of the drywell liner at selected elevations.

According to UT thickness measurements taken from inside of the Oyster Creek drywell and reported in a NRC summary of a meeting with GPUN dated May 05, 1993 several areas were experiencing corrosion, particularly severe in the Sand Bed region of the steel drywell liner:

<u>Drywell Region</u>	<u>As Designed</u>	<u>Minimum Required</u>	<u>Current Thinnest</u> <u>12/92</u>	<u>Previous Thinnest</u> <u>07/91</u>
<b>Cylinder</b>	0.640"	0.580"	0.614"	0.612"
<b>Upper Sphere</b> (Elev. 51' to 65')	0.722"	0.650"	0.691"	0.695"
<b>Middle Sphere</b> (Elev. 23' to 51')	0.770"	0.670"	0.743"	0.745"
<b>Sand Bed</b> (Lowest Region)	1.154"	0.736"	0.800"	0.803"

(Source: US NRC)<sup>8</sup> [PETITIONERS' EXHIBIT 4]

The Petitioners submit that in 1992, UT measurements indicated that as little as .064 inches remained between as found and minimum required.

All drywell liner bays showed presence of a "Bathtub Ring"- an 8 to 18 inch wide band about 30 to 40 inches long- containing similarly heavily corroded areas. At that time GPUN management made the comment to NRC "The integrity of the Oyster Creek Drywell remains a priority concern of GPUN management, *we will continue UT thickness measurements for the life of the plant* (emphasis added)"<sup>9</sup>

[PETITIONERS' EXHIBIT 5]

<sup>8</sup> Summary of May 05, 1993 Meeting with GPU Nuclear (GPUN) To Discuss Matters Related to the Oyster Creek Drywell Corrosion Mitigation Program, US NRC, May 17, 1993, Enclosure 2, Summary of 14R UT Thickness Measurements (Taken from Inside Drywell).

<sup>9</sup> Ibid, May 05, 1993, GPUN Conclusions

Oyster Creek's 15<sup>th</sup> Refueling Outage in September 1994 was the last time that UT measurements were taken at the sandbed region of the drywell liner. The UT measured minimums at the sand bed region were recorded at 0.806 inches while the Code required 0.736 inches as determined by buckling calculations for the drywell liner.<sup>10</sup>

**[PETITIONERS EXHIBIT 6]** At that time the operator submitted that there was evidence of ongoing corrosion in the upper regions and sand bed region of the dry well liner which was cleaned of sand and rust and coated in December 1992. At that time, GPU Nuclear stated that *"after 21 months of service, the coating is performing satisfactory with no signs of deterioration such as blisters, flakes, discoloration, etc."*<sup>11</sup>

GPU in their letter of 9/15/95 estimated that the life of the epoxy coating would be 8-10 years, bringing it to the end of its life between December 2000 and December 2002.

The Petitioners contend that the applicant does not indicate whether visual coating inspections since the original application have been made specifically for pinhole leaks in the coating which could allow for water seepage behind the epoxy coating resulting in corrosion behind the coating on the exterior surface of the already degraded component. Because the remaining measured margin of .064 inches in an unknown number of locations within the severely corroded sand bed region is so extremely narrow, Petitioners contend that the described observable blisters, flakes and discoloration do not need to occur before the component is in fact outside of safety tolerances due to ongoing corrosion behind the coating. In fact, the applicant's reliance upon only visual examinations may not actually be able to observe corrosion of the exterior liner to below tolerances at such narrow margins. The Petitioners have consulted their expert, Dr. Rudolph Hausler of Corro-Consulta (See attached Affidavit), on this matter of fact, who supports this contention.

The application states at Page 3-5-20 that the Protective Coating Monitoring Program

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<sup>10</sup> Oyster Creek Dry Well Corrosion Monitoring Program, GPUN, September 15, 1995, Table 1.

<sup>11</sup> Ibid., Oyster Creek Monitoring Program 1995

was revised to include monitoring of the coating at the former sand bed region. The application does not specify the degree of inspection, other than visual, merely stating: *“The coated surfaces were inspected during refueling outages of 1996, 2000 and 2004. The inspections showed no coating failure or signs of deterioration. It is therefore concluded that corrosion in the sand bed region has been arrested and no further loss of material is expected.”*

However, the Petitioners point out that the application does not indicate that the coated areas were ever inspected specifically for pinhole leaks in the coating at any time since the application in 1992. As such, the Petitioners further contend that wet conditions occurring over the past 12 years behind the epoxy coating can reasonably contribute to corrosion. For this reason, the Petitioners contend that confirmatory UT inspections with state of the art equipment must be employed so as to ascertain the actual remaining wall thicknesses of this safety structure.

As is stated in the Oyster Creek Inservice Inspection Report dated February 16, 2005 inspections of the drywell liner were conducted between October 28, 2004 and November 22, 2004 during the 20<sup>th</sup> Refueling Outage .<sup>12</sup> **[PETITIONERS EXHIBIT 7]**

The ISI includes Attachment 1 “NIS-1 Owner’s Data Report for Inservice Inspections performed in accordance with ASME Code, Section XI, 1995 Edition with Addenda. In Attachment 1 entitled Oyster Creek Generating Station ISI Post 1R20 Outage Summary Report under “Abstract of Examinations and Tests” of the submittal AmerGen states: *“In addition, visual and UT examinations were completed on the drywell and torus in accordance with ASME Section IWE (Containment Program). In summary, all examinations were completed successfully.”*<sup>13</sup>

Attachment 2 Form NIS-1 for Containment ISI Program-IWE “Abstract of Examinations and Tests” states: *“Oyster Creek is at the end of the second period of the first inspection*

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<sup>12</sup> Oyster Creek Generating Station Refueling Outage 20 (1R20) Inservice Inspection Report (ISI) Summary Report, Amergen, February 16, 2005.

<sup>13</sup> Ibid, Attachment 1, p. 3.

*internal for containment inspections. These examinations were performed to fulfill the requirements of ASME Section XI, 1992 Edition with the 1992 Addenda. Examinations were performed on all accessible areas of the interior and exterior of the drywell and torus suppression chamber. The augmented examination of the drywell liner and exterior sand bed area was performed.”<sup>14</sup>*

The Petitioners submit that close examination of TABLE 1-Containment ISI Program pages 1-17 and particularly in regard to all documented inspections of the drywell and drywell liner, the only identified “Method” provided by AmerGen was “VT-G” or Visual Testing. There are no designations or indications that any “UT” or Ultrasonic Testing was specifically conducted on the drywell liner. In fact, there are no values for drywell liner wall thicknesses assigned or provided at any levels of the containment component including the Upper Sphere, Middle Sphere and Sand Bed Region in the 2005 report for the 2004 inspections.

The Petitioners further submit the NRC meeting summary of May 12, 2005 covering the Annual Assessment with AmerGen which states *“The licensee has visually inspected the coating applied to the liner in the sandbed region in 1996, 2000 and 2004. The visual inspection determined the coating repair is in very good condition. For regions above the sandbed, ultrasonic inspections have been periodically completed for the areas that exhibited the worst corrosion in 1992, 1996, 2000, and 2004. No significant degradation has been identified for the regions above the sandbed.”*<sup>15</sup>

**[PETITIONERS EXHIBIT 8]**

Petitioners further submit NRC document “Changes in the Oyster Creek Drywell Monitoring Program” (TAC No. M93658) dated November 1, 1995.<sup>16</sup> **[PETITIONERS’ EXHIBIT 9]**. As is stated, in a letter dated September 15, 1995, GPU Nuclear stated that they had assessed the condition of the drywell and that they remained committed to

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<sup>14</sup> Ibid, Attachment 2, p. 4

<sup>15</sup> Summary of May 12, 2005, Annual Meeting Assessment Meeting with AmerGen, Oyster Creek Generating Station, United States Nuclear Regulatory Commission, June 21, 2005, page 6.

<sup>16</sup> “Changes In The Oyster Creek Drywell Monitoring Program” (TAC No. M93658), US NRC, dated Novmeber 1, 1995.

continue taking drywell thickness measurements for the life of the plant.

GPUN had also requested a reduction in the monitoring program to discontinue UT measurements at the former sand bed region based on UT examinations during the 15<sup>th</sup> refueling outage. The document states that NRC accepted the GPUN proposed examination reduction and GPUN's commitment to additional inspection at the sand bed region within approximately 3 months after discovery of water leakage from the pools above the reactor cavity.

Petitioners submit and contend that this NRC staff evaluation was based on the 40-year license and did not contemplate and analyze a twenty-year license extension. Petitioners submit that lesser spills of water which could also include corrosive borated water from the refueling canal or leaks in the spent fuel pool could be taking place and therefore justifies the Petitioners' reasonable request that confirmatory inspections be made at the level of the component which was found to be the most severely corroded area and subjected only to visual exams of the coating since 1994.

Therefore, the Petitioners submit that no UT measurements have been made at the severely corroded sandbed region, which in fact experienced the most severe known corrosion, and at present still has the closest remaining margins (0.064 inches or less) on this safety-related structure since the epoxy coating was originally applied in 1992. The Petitioners further submit that the applicant has not provided reasonable assurance that the epoxy coating has been adequately monitored for all possible methods of leakage behind the coating including pinhole leaks that could provide a pathway for water intrusion and subsequent corrosion.

It is clear to the Petitioners that the epoxy coating in and of itself is not the structural load bearing or pressure boundary on this safety-related structure but in fact the remaining dry well wall thickness that is of paramount concern to the Petitioners. The Petitioners therefore contend that it is unreasonable to rely on solely on visual inspections of the condition of the coating for expectations of containment performance for an additional twenty years.

The Petitioners contend that the burden of proof is now on the applicant with its request for an additional 20-year license extension to provide the reasonable assurance with physical measurements as evidence that the actual remaining drywell wall thickness have enough margin to meet the applicable ASME requirements through confirmatory state-of-the-art UT measurements which in the discovery of the degree of the severe corrosion both NRC and the operator of Oyster Creek had previously deemed necessary "*for the life of the plant*" in order to assure public safety. Arguably, the Petitioners contend that this must certainly apply to a re-licensing proceeding for the 20-extension of "*the life of the plant.*"

The Petitioners further provide the affidavit of Dr. Rudolph Hausler, Corro-Consulta, in support of their contention in the matter of American Energy Company, LLC application to extend the operation license of Oyster Creek nuclear power station by twenty years.

Signed,



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Michele Donato

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November 14, 2005

UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY

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In the Matter of	)	
	)	Docket No. 50-0219
AMERICAN ENERGY COMPANY,LLC (ALSO KNOWN AS AMERGEN)	)	
OYSTER CREEK NUCLEAR GENERATING STATION	)	
	)	NOVEMBER 14, 2005
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	

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CERTIFICATE OF SERVICE

I hereby certify that the foregoing Request for Hearing and Petition to Intervene was sent this 14<sup>th</sup> day of November, 2005 via email and U.S. Postal Service as designated to each of the following:

Secretary of the Commission (Email and 2 copies via U.S Postal Service)  
United States Nuclear Regulatory Commission  
Washington, DC 20555-0001  
Attention: Rulemaking and Adjudications Staff  
Email: [HEARINGDOCKET@NRC.GOV](mailto:HEARINGDOCKET@NRC.GOV)

Office of General Counsel (Email and U.S. Postal Service)  
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Certificate of Service (continued)

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Signed



Michele Donato, Esq.

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November 14, 2005

UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY

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In the Matter of )  
 ) Docket No. 50-0219  
AMERICAN ENERGY COMPANY,LLC )  
(ALSO KNOWN AS AMERGEN) )  
OYSTER CREEK NUCLEAR )  
GENERATING STATION )  
 ) NOVEMBER 14, 2005  
Regarding the Renewal of Facility Operating )  
License No. DPR-16 for a 20-Year Period )

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NOTICE OF APPEARANCE FOR MICHELE DONATO, ESQ.

Pursuant to 10 CFR 2.7133(b), Michele Donato, Esquire, hereby enters an appearance on behalf of Nuclear Information and Resource Service (NIRS), Jersey Shore Nuclear Watch, Inc. (JSNW), Grandmothers, Mothers and More for Energy Safety (GRAMMIES), New Jersey Public Interest Research Group, New Jersey Sierra Club, and New Jersey Environmental Federation provides the following information:

1. I am an attorney licensed to practice law in New Jersey. My offices are located at 106 Grand Central Avenue, Lavallette, N.J.
2. I have been appointed by the petitioners to jointly represent these organizations in this proceeding.

  
\_\_\_\_\_  
Michele Donato, Esq.

11/14/2004  
Date

UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY

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In the Matter of )  
AMERICAN ENERGY COMPANY,LLC ) Docket No. 50-0219  
(ALSO KNOWN AS AMERGEN) )  
OYSTER CREEK NUCLEAR )  
GENERATING STATION )  
Regarding the Renewal of Facility Operating ) NOVEMBER 14, 2005  
License No. DPR-16 for a 20-Year Period )

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NOTICE OF APPEARANCE OF PAUL GUNTER

Pursuant to 10 CFR 2.7133(b), Paul Gunter hereby enters an appearance on behalf of Nuclear Information and Resource Service (NIRS) and provides the following information:

1. I am Director of the Reactor Watchdog Project at Nuclear Information and Resource Service at 1424 16<sup>th</sup> Street NW Suite 404, Washington, DC 20036, Tel. 202 328 0002.
2. I have been appointed by NIRS to represent the organization and its New Jersey members in this proceeding.

/s/ Paul Gunter  
Paul Gunter

11/14/2004  
Date

**UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY**

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In the Matter of	)	
AMERICAN ENERGY COMPANY, I.I.C	)	Docket No. 50-0219
(ALSO KNOWN AS AMERGEN)	)	
OYSTER CREEK NUCLEAR	)	
GENERATING STATION	)	
Regarding the Renewal of Facility Operating	)	NOVEMBER 14, 2005
License No. DPR-16 for a 20- Year Period	)	

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**DECLARATION OF WILLIAM deCAMP JR.  
IN SUPPORT OF PETITION TO REQUEST A HEARING AND  
LEAVE TO INTERVENE ON  
THE OYSTER CREEK LICENSE RENEWAL APPLICATION**

The following statements are true under the penalty of perjury.

- 1.) My name is William deCamp Jr. I am a member of Nuclear Information and Resource Service.
- 2.) I have a residence at 1229 Bay Avenue, Mantoloking, NJ. My home lies within eighteen miles of the Oyster Creek nuclear power station site in Toms River New Jersey, owned by AmerGen. The applicant, American Energy Company, LLC a subsidiary of Exelon Nuclear Corporation, has applied to the U.S. Nuclear Regulatory Commission ("NRC") for a twenty (20) year license extension.
- 3) I believe that the application for a license extension of the Oyster Creek nuclear generating station is sufficiently inadequate as written and my interests will not be adequately represented without this action to intervene and without the opportunity of

NIRS to participate as a full party in this proceeding on my behalf. If the Oyster Creek Nuclear Generating Station license is renewed without resolving the Petitioners' safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment, thereby jeopardizing the health and welfare of the respective Petitioners'-Intervenors' members who live, recreate and have businesses within the vicinity of the nuclear power reactor. I am concerned that if an accident were to occur at the Oyster Creek nuclear generating station I might be killed, seriously injured or sickened by the radioactive releases.

Wilhelm de Camp  
Signature

14 Nov 2005  
Date

**UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY**

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In the Matter of	)	
	)	Docket No. 50-0219
AMERICAN ENERGY COMPANY,LLC (ALSO KNOWN AS AMEGEN)	)	
OYSTER CREEK NUCLEAR GENERATING STATION	)	
	)	NOVEMBER 14, 2005
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	

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**DECLARATION OF EDITH GBUR  
IN SUPPORT OF PETITION TO REQUEST A HEARING AND  
LEAVE TO INTERVENE ON  
THE OYSTER CREEK LICENSE RENEWAL APPLICATION**

The following statements are true under the penalty of perjury.

- 1.) My name is Edith Gbur. I am President of Jersey Shore Nuclear Watch, Inc. (JSNW).
- 2.) I have a residence at 364 Costa Mesa Drive, Toms River New Jersey. My home lies within 10 miles of the Oyster Creek nuclear power station site in Toms River New Jersey, owned by AmerGen. The applicant, American Energy Company, LLC a subsidiary of Exelon Nuclear Corporation, has applied to the U.S. Nuclear Regulatory Commission ("NRC") for a twenty (20) year license extension.
- 3) I believe that the application for a license extension of the Oyster Creek nuclear generating station is sufficiently inadequate as written and my interests will not be adequately represented without this action to intervene and without the opportunity of the Petitioner to participate as a full party in this proceeding on my behalf. If the Oyster

Creek Nuclear Generating Station license is renewed without resolving the Petitioners' stated safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment, thereby jeopardizing the health and welfare of the respective Petitioners'-Intervenors' members who live, recreate and have businesses within the vicinity of the nuclear power reactor.

*Edith Gbur*

Signature

*Nov. 14, 2005*

Date

**UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY**

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In the Matter of	)	
AMERICAN ENERGY COMPANY,LLC (ALSO KNOWN AS AMERGEN)	)	Docket No. 50-0219
OYSTER CREEK NUCLEAR GENERATING STATION	)	
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	NOVEMBER 14, 2005

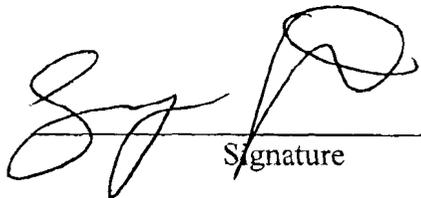
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**DECLARATION OF NEW JERSEY PUBLIC INTEREST RESEARCH GROUP  
IN SUPPORT OF PETITION TO REQUEST A HEARING AND  
LEAVE TO INTERVENE ON  
THE OYSTER CREEK LICENSE RENEWAL APPLICATION**

The following statements are true under the penalty of perjury.

- 1.) My name is Suzanne Leta. I am a member of New Jersey Public Interest Research Group.
  - 2.) My work address is 11 N. Willow St, Trenton, New Jersey 08608 and my home address is 60 Paterson St, Apt 701, New Brunswick, NJ 08901. My home and my workplace are within 50 miles of the Oyster Creek nuclear power station site in Lacey Township, New Jersey, owned by AmerGen. The applicant, American Energy Company, LLC a subsidiary of Exelon Nuclear Corporation, has applied to the U.S. Nuclear Regulatory Commission ("NRC") for a twenty (20) year license extension.
  - 3) I believe that the application for a license extension of the Oyster Creek nuclear generating station is sufficiently inadequate as written and my interests will not be
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adequately represented without this action to intervene and without the opportunity of the Petitioner to participate as a full party in this proceeding on my behalf. If the Oyster Creek Nuclear Generating Station license is renewed without resolving the Petitioners' stated safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment, thereby jeopardizing the health and welfare of the respective Petitioners' -Intervenors' members who live, recreate and have businesses within the vicinity of the nuclear power reactor. My concerns focus on the possibility that if Oyster Creek's license is renewed without resolving the stated safety issues a nuclear accident could result that causes the death or sickening of myself and my family.

  
\_\_\_\_\_  
Signature

11/14/05  
\_\_\_\_\_  
Date

**UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY**

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In the Matter of	)	
	)	Docket No. 50-0219
AMERICAN ENERGY COMPANY, LLC (ALSO KNOWN AS AMERGEN)	)	
OYSTER CREEK NUCLEAR GENERATING STATION	)	
	)	NOVEMBER 14, 2005
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	

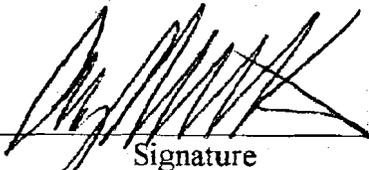
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**DECLARATION OF AMY GOLDSMITH AS A MEMBER OF THE  
NEW JERSEY ENVIRONMENTAL FEDERATION  
IN SUPPORT OF PETITION TO REQUEST A HEARING AND  
LEAVE TO INTERVENE ON  
THE OYSTER CREEK LICENSE RENEWAL APPLICATION**

The following statements are true under the penalty of perjury.

- 1.) My name is Amy Goldsmith. I am a member of the New Jersey Environmental Federation.
- 2.) I have a residence at 16 Locust Avenue, Red Bank, New Jersey 07701. My home lies within 50 miles of the Oyster Creek nuclear power station site in Lacey Township, New Jersey, owned by AmerGen. The applicant, American Energy Company, LLC a subsidiary of Exelon Nuclear Corporation, has applied to the U.S. Nuclear Regulatory Commission ("NRC") for a twenty (20) year license extension.
- 3) I believe that the application for a license extension of the Oyster Creek nuclear generating station is sufficiently inadequate as written and my interests will not be adequately represented without this action to intervene and without the opportunity of the

Petitioner to participate as a full party in this proceeding on my behalf. If the Oyster Creek Nuclear Generating Station license is renewed without resolving the Petitioners' stated safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment, thereby jeopardizing the health and welfare of the respective Petitioners' -Intervenors' members who live, recreate and have businesses within the vicinity of the nuclear power reactor. My concerns focus on the possibility that if Oyster Creek's license is renewed without resolving the stated safety issues a nuclear accident could result that causes the death or sickening of myself and my family.



Signature

Amy Goldsmith

11/14/05

Date

**UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY**

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In the Matter of	)	
	)	Docket No. 50-0219
AMERICAN ENERGY COMPANY,LLC (ALSO KNOWN AS AMERGEN)	)	
OYSTER CREEK NUCLEAR GENERATING STATION	)	
	)	NOVEMBER 14, 2005
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	

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**DECLARATION OF PAULA GOTSCH  
IN SUPPORT OF PETITION TO REQUEST A HEARING AND  
LEAVE TO INTERVENE ON  
THE OYSTER CREEK LICENSE RENEWAL APPLICATION**

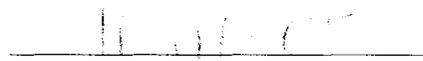
The following statements are true under the penalty of perjury.

- 1.) My name is Paula Gotsch. I am a member of Grandmothers, Mothers and More for Energy Safety (GRAMMIES).
- 2.) I have a residence at 205 Sixth Avenue, Normandy Beach, New Jearsey. My home lies within 50 miles of the Oyster Creek nuclear power station site in Lacey Township, New Jersey, owned by AmerGen. The applicant, American Energy Company, LLC a subsidiary of Exelon Nuclear Corporation, has applied to the U.S. Nuclear Regulatory Commission (“NRC”) for a twenty (20) year license extension.
- 3) I believe that the application for a license extension of the Oyster Creek nuclear generating station is sufficiently inadequate as written and my interests will not be adequately represented without this action to intervene and without the opportunity of the

Petitioner to participate as a full party in this proceeding on my behalf. If the Oyster Creek Nuclear Generating Station license is renewed without resolving the Petitioners' stated safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment, thereby jeopardizing the health and welfare of the respective Petitioners'-Intervenors' members who live, recreate and have businesses within the vicinity of the nuclear power reactor. My concerns focus on the possibility that if Oyster Creek's license is renewed without resolving the stated safety issues a nuclear accident could result that causes the death or sickening of myself and my family.

A handwritten signature in black ink, appearing to read "R. J. ...", written over a horizontal line.

Signature

A handwritten date in black ink, appearing to read "11/1/05", written over a horizontal line.

Date

**UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY**

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In the Matter of	)	
	)	Docket No. 50-0219
AMERICAN ENERGY COMPANY,LLC (ALSO KNOWN AS AMERGEN)	)	
OYSTER CREEK NUCLEAR GENERATING STATION	)	
	)	NOVEMBER 14, 2005
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	

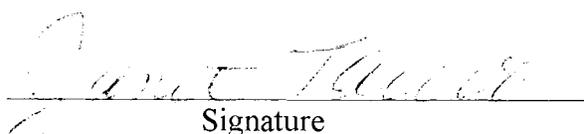
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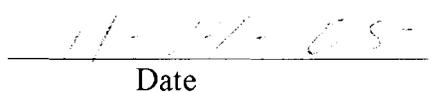
**DECLARATION OF JANET TAURO  
IN SUPPORT OF PETITION TO REQUEST A HEARING AND  
LEAVE TO INTERVENE ON  
THE OYSTER CREEK LICENSE RENEWAL APPLICATION**

The following statements are true under the penalty of perjury.

- 1.) My name is Janet Tauro. I am a member of Grandmothers, Mothers and More for Energy Safety (GRAMMIES) .
  - 2.) I have a residence at 747 Bay Avenue, Brick, NJ. My home lies within 50 miles of the Oyster Creek nuclear power station site in Toms River New Jersey, owned by AmerGen. The applicant, American Energy Company, LLC a subsidiary of Exelon Nuclear Corporation, has applied to the U.S. Nuclear Regulatory Commission (“NRC”) for a twenty (20) year license extension.
  - 3) I believe that the application for a license extension of the Oyster Creek nuclear generating station is sufficiently inadequate as written and my interests will not be adequately represented without this action to intervene and without the opportunity of the
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Petitioner to participate as a full party in this proceeding on my behalf. If the Oyster Creek Nuclear Generating Station license is renewed without resolving the Petitioners' stated safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment, thereby jeopardizing the health and welfare of the respective Petitioners'-Intervenors' members who live, recreate and have businesses within the vicinity of the nuclear power reactor. My concerns focus on the possibility that if Oyster Creek's license is renewed without resolving the stated safety issues a nuclear accident could result that causes the death or sickening of myself and my family.

  
Signature

  
Date

**UNITED STATES OF AMERICA  
BEFORE THE NUCLEAR REGULATORY COMMISSION  
OFFICE OF THE SECRETARY**

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In the Matter of	)	
	)	Docket No. 50-0219
AMERICAN ENERGY COMPANY,LLC (ALSO KNOWN AS AMERGEN)	)	
OYSTER CREEK NUCLEAR GENERATING STATION	)	
	)	NOVEMBER 14, 2005
Regarding the Renewal of Facility Operating License No. DPR-16 for a 20-Year Period	)	

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**DECLARATION OF GREG AURIEMMA  
IN SUPPORT OF PETITION TO REQUEST A HEARING AND  
LEAVE TO INTERVENE ON  
THE OYSTER CREEK LICENSE RENEWAL APPLICATION**

The following statements are true under the penalty of perjury.

- 1.) My name is GREG AURIEMMA. I am a member of New Jersey Sierra Club.
- 2.) I have a residence at 50 KETTLE CREEK DRIVE, BRICK, NEW JERSEY, 08723. My home lies within 50 miles of the Oyster Creek nuclear power station site in Lacey Township, New Jersey, owned by AmerGen. The applicant, American Energy Company, LLC a subsidiary of Exelon Nuclear Corporation, has applied to the U.S. Nuclear Regulatory Commission ("NRC") for a twenty (20) year license extension.
- 3) I believe that the application for a license extension of the Oyster Creek nuclear generating station is sufficiently inadequate as written and my interests will not be adequately represented without this action to intervene and without the opportunity of the Petitioner to participate as a full party in this proceeding on my behalf. If the Oyster

Creek Nuclear Generating Station license is renewed without resolving the Petitioners' stated safety concern, this nuclear generating station may operate unsafely and pose an unacceptable risk to the environment, thereby jeopardizing the health and welfare of the respective Petitioners'-Intervenors' members who live, recreate and have businesses within the vicinity of the nuclear power reactor. My concerns focus on the possibility that if Oyster Creek's license is renewed without resolving the stated safety issues a nuclear accident could result that causes the death or sickening of myself and my family.



Signature

NOVEMBER 14, 2005

Date

GREG AURIEMMA

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## CORRO-CONSULTA

8081 Diane Drive  
Tel: 972 962 8287 (office)  
Tel: 972 824 5871 (mobile)

Rudolf H. Hausler  
*rudyhau@msn.com*

Kaufman, TX 75142  
Fax: 972 932 3947

### MEMORANDUM

**To:** Mr. Paul Gunter, Director  
Reactor Watchdog Project  
Nuclear Information and Resource Service  
Washington DC 10036

November 10, 2005

**From:** Dr. Rudolf H. Hausler, President  
Corro-Consulta

**Subject:** Oyster Creek Drywell Liner Corrosion

#### **A. Definition of the Problem**

Localized corrosion had been observed on the outside wall of the dry well containment vessel of the Oyster Creek nuclear reactor as early as 1986. The corrosion was localized in the "sand bed area" at an elevation of about 11ft above the concrete floor. Detailed investigation in 1992 and 1994 determined a thinning of the wall from 1.154 inches to about 0.800 inches. (This calculates to an average local penetration rate – pitting rate – of about 15.4 mils per year). Structural integrity calculations indicated a minimum safe allowable remaining wall thickness in the corroded areas of 0.75 inches. In 1994 the sand bed was apparently removed and the corroded areas coated with an epoxy coating. At this time little is known about the nature of the coating, the manner in which it was applied, and its thickness.

Hence, the question arises whether in the period from 1994 to 2005 the coating prevented additional corrosion and whether the structure is still safe enough to be certified for an additional 20 years of operation. It has been proposed to verify this proposition by visual inspection, and use this methodology to ascertain that no additional corrosion has further impaired the integrity of the vessel.

#### **B. The Apparent Operating Conditions**

It had been stated that the inside temperature of the dry well had been raised in 1994 from 175 °F to 292 °F. This latter temperature, which should have prevailed during normal operation of the reactor from 1994 to the present, would have been high enough to prevent the presence of liquid water in the corroded, coated, area on the outside wall of the dry well vessel. However, this temperature, even taking into account a lowering of the temperature on the outside of the vessel wall due to heat flux, would still be high enough to cause slow deterioration of the epoxy coating. Such deterioration in and of it self

would not have been a concern provided that no liquid water would ever be present in this area. This condition, however, could not ever be ascertained because, as has happened before (primary cause of corrosion), water could and can enter the space between the concrete containment and the dry well wall during refueling and other non-planned outages. Deteriorated epoxy coating and the presence of liquid, oxygen containing, water would certainly lead to additional localized corrosion. (The drain channels, which had been added to drain the sand bed cannot possibly be effective enough to drain all water from the area and prevent condensation if conditions were right for such to occur).

It turns out, however, that newer information indicates that the conditions specified in 1994 were not strictly maintained. Apparently the temperatures inside the dry well vary from 135 °F at the 55 ft elevation to 250 °F at 95 ft. This temperature gradient would certainly allow for liquid water presence at the 11 ft elevation (Sandbed), i.e. in the annular space were previously the sandbed was located.

Epoxy resins in contact with water can, depending on the nature of the epoxy and the prevailing temperature, deteriorate over time. Furthermore, the application of epoxy resins on metal surfaces may result in holidays (pinholes) depending on surface preparation, the curing process, and general cleanliness. There is, therefore, no guarantee that the epoxy coating prevented further growth of existing pits.

### **C. Direct Assessment of Additional Corrosion.**

It has been proposed that visual observation of the damaged/coated areas would be sufficient to verify that no additional corrosion had occurred. Additional severe corrosion would in deed manifest itself by the formation of rust, which would lead to blistering and cracking of the epoxy coating, and could be observed visually by means of fiberoptic devices. (Note that the epoxy may have thermally, or otherwise, deteriorated over time to a point where it is no longer transparent, if it ever was). However, the absence of such observations does not necessarily mean that no additional corrosion occurred in the pitted areas. As a consequence it would appear absolutely essential that at this point direct assessment of the integrity of the vessel is unavoidable. The last UT measurements in 1994 indicated a minimum wall thickness of 0.8 inches. The minimum allowable wall thickness for safe operation had been given as 0.75 inches. A further deterioration of 0.05 inches over 11 years would mean an average local penetration rate of the order of 0.005 inches (5 mils per year). This small pitting rate is absolutely possible and would not necessarily lead to a visible deterioration of the epoxy coating. UT measurements through the epoxy coating are highly questionable and lack in accuracy. Therefore, the coating has to be removed and pit depth assessment has to be made with the best applicable methodology. UT measurements on the outside of the vessel wall are very difficult and have to be made by highly technically trained personnel. Optical pit depth measurements are no doubt more reliable.

It is understood that it is impossible to examine the entire circumference of the dry well vessel at the elevation where the “bathtub ring” appeared. Since it is only possible to examine relative small areas through access channels bored into the concrete containment, it will be necessary not only to find and measure the deepest pit, as had been done before, but in fact to measure all accessible pit depths. This needs to be done through a number of access channels and the complement of all so measured pit depths needs to be evaluated by extreme value statistics in order to extract the deepest probable pit with some reasonable probability. **This procedure of determining the most probable deepest pit with a probability of say 99.9% has not been done before and must, in the opinion of this writer, be done before this reactor, and in fact any other reactor with the same problem, can be handed over for an other 20 years of safe operation.** (Note: previously it had been thought that a 95% confidence limit was sufficient. There is a real question whether that kind of probability limit is adequate for nuclear reactor operation).

**Signed,**