RAS 10870

PETITIONERS' EXHIBIT 10

GPU Nuclear Corporation
One Upper Pond Road
Parsippany, New Jersey 07054
201-316-7000
TELEX 136-482
Writer's Direct Dial Number:

December 15, 1995
5000-95-098
C321-95-2360

U. S. Nuclear Regulatory Commission
Att: Document Control Desk
Washington, DC 20555

Gentlemen:

Subject: Oyster Creek Nuclear Generating Station (OCNGS)
Docket No. 50-219
Facility Operating License No. DPR-16
Drywell Corrosion Monitoring Program

References: (1) NRC Letter dated November 1, 1995, "Changes in the Oyster Creek Drywell Monitoring Program."

(2) GPU Nuclear Letter C321-95-2235, "Drywell Corrosion Monitoring Program," September 15, 1995.

Reference 1 requested GPU Nuclear to make a commitment, as part of the proposed extended Oyster Creek Drywell Monitoring Program (Reference 2), to perform "...additional inspection within approximately 3 months after discovery of water leakage from pools above the reactor cavity." Subsequent discussion with the NRC Staff provided clarification that this request was made to address contingency actions should water leakage be discovered during power operation between scheduled drywell inspections. The requirement was not meant to apply to minor leakage associated with normal refueling activities.

Accordingly, GPU Nuclear proposes to commit to take the following actions should water leakage not associated with normal refueling outage activities be discovered during power operation.

(1) The Oyster Creek NRC Resident Inspector will be notified of the discovery of leakage.

(2) The source of leakage will be investigated and appropriate corrective actions taken.

(3) An evaluation of the impact of the leakage on drywell structural integrity will be performed to ensure sufficient structural margin is maintained for operation to the next scheduled drywell inspection.

(4) In the unexpected event that the evaluation of the impact of the leakage on drywell structural integrity does not ensure sufficient structural margin will be maintained for operation to the next scheduled outage, an additional drywell inspection will be performed within approximately 3 months after discovery of water leakage.

If you have any questions or comments on this submittal, please contact Mr. Ron Zak, Corporate Regulatory Affairs at (201) 316-7035.

Very truly yours,

R. W. Keaten
Vice President and Director
Technical Functions

c: Administrator, Region 1
Senior Resident Inspector
Oyster Creek NRC Project Manager

PETITIONERS' EXHIBIT 11

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 15, 1996

Mr. Michael B. Roche
Vice President and Director
GPU Nuclear Corporation
Oyster Creek Nuclear Generating Station
P.O. Box 388
Forked River, NJ 08731

SUBJECT: CHANGES IN THE DRYWELL CORROSION MONITORING PROGRAM (TAC NO. M92688)

Dear Mr. Roche:

In a letter dated November 1, 1995, NRC informed GPU Nuclear Corporation (GPUN) that the changes to the previously committed Drywell Corrosion Monitoring Program as delineated in GPUN's letter dated September 15, 1995, are acceptable. However, GPUN is required to make a commitment to perform additional inspections of the drywell 3 months after the discovery of any water leakage. GPUN felt such a requirement is too broad to be cost effective. In a letter dated December 15, 1995, GPUN clarified its commitment and an understanding between the NRC staff and GPUN has been reached. The requirement is to address water leakage discovered during power operation between scheduled drywell inspections. The requirement was not meant to apply to minor leakage associated with normal refueling activities where minor leakage is defined as less than 12 GPM (gallons per minute). GPUN indicated that prior to each refueling outage, a refueling cavity and equipment pool inspection and leak assessment plan is put in place and the plan has been found to be successful in prior outages. For leakages not associated with refueling activities, GPUN will investigate the source of leakage, take corrective actions, evaluate the impact of the leakage and, if necessary, perform an additional drywell inspection about 3 months after the discovery of the water leakage.

Based on the additional information provided by GPUN, the staff finds GPUN's commitment to perform the inspections acceptable.

Sincerely,

Alexander W. Dromerick

Alexander W. Dromerick, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-219

cc: See next page

AmerGen SM
An Exelon Company

C. N. (Bud) Swenson
Site Vice President

Oyster Creek Generating Station
US Route 9 South
P.O. Box 388
Forked River, NJ 08731

Telephone 609.971.2300
www.exeloncorp.com
bud.swenson@amergenenergy.com

10 CFR 50
10 CFR 51
10 CFR 54

2130-05-20214

October 12, 2005

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Oyster Creek Generating Station
Facility Operating License No. DPR-16
NRC Docket No. 50-219

Subject: Response to NRC Request for Additional Information (RAI 2.5.1.19-1), dated September 28, 2005, Related to Oyster Creek Generating Station License Renewal Application (TAC NO. MC7624)

References: (1) "Application for Renewed Operating License," Oyster Creek Generating Station, dated July 22, 2005

(2) "Request for Additional Information (RAI) for the Review of the Oyster Creek Generating Station, License Renewal Application (TAC NO. MC7624)"

In Reference (2), the NRC requested additional information related to Section 2.5.1.19 of the Oyster Creek Generating Station License Renewal Application (LRA). In the RAI, the NRC expressed the need for additional information to evaluate the long-lived passive components of the Combustion Turbine Power Plant and any aging management programs and aging management reviews related to those components.

AmerGen has revised its approach to aging management for the Oyster Creek Station Blackout System Combustion Turbine Power Plant. Specifically, AmerGen has taken a more detailed approach to scoping, screening, aging management reviews and aging management programs.

A more detailed scoping system description has been provided, correlating to Section 2.5.1.19 of the Oyster Creek LRA for scoping and screening results. The expanded information was developed using the same methodology for scoping other Oyster Creek systems and component types and is consistent with other LRA system information such as that provided for the Emergency Diesel Generators. The electrical commodity groups for the Station Blackout System have been identified and evaluated for aging management review as was performed for Oyster Creek electrical commodities in Section 2.5.2 of the OC LRA. Appendix B of the Enclosure contains this information.

A114

Screening has been performed that itemizes the mechanical, electrical and structural component types that comprise the Combustion Turbine Power Plant at a detailed level, consistent with other license renewal systems such as the Emergency Diesel Generators. Appendix C of the Enclosure contains the results of the associated Aging Management Reviews.

Previously, AmerGen had proposed one Aging Management Program for the Combustion Turbine Power Plant that focused on reliability as determined by existing maintenance and testing activities. The new plan employs two electrical Aging Management Programs and one structural Aging Management Program. These program changes are described in Appendix D of the Enclosure. Further work is required to establish the Aging Management Programs for the mechanical components. This work will be completed and the information provided in a supplemental response no later than November 11, 2005.

This new approach reflects methodology similar to that applied to the Emergency Diesel Generator system. These Aging Management Reviews and Aging Management Programs will provide assurance that aging effects associated with the Station Blackout System will be managed consistent with the current licensing basis for the period of extended operation.

A summary of commitments, as was presented in Table A.5 of the Oyster Creek License Renewal Application, is presented in Appendix A of the Enclosure.

If you have any questions, please contact Fred Polaski, Manager License Renewal, at 610-765-5935.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

Executed on 10/12/2005

C. N. Swenson
Site Vice President
Oyster Creek Generating Station
AmerGen Energy Company, LLC

Enclosure: Response to Request for Additional Information

cc: Regional Administrator, USNRC Region I, w/o Enclosure
USNRC Project Manager, NRR - License Renewal, Safety
USNRC Project Manager, NRR - License Renewal, Environmental, w/o Enclosure
USNRC Project Manager, NRR - Senior Project Manager, Oyster Creek
USNRC Senior Resident Inspector, Oyster Creek, w/o Enclosure
Bureau of Nuclear Engineering, New Jersey Department of Environmental Protection
File No. 05040

- The program will require inspection of penetration seals, structural seals, and other elastomers for change in material properties by inspecting the elastomers for cracking and hardening.

- The program will require inspection of vibration isolators, associated with component supports other than those covered by ASME XI, Subsection IWF, for reduction or loss of isolation function by inspecting the isolators for cracking and hardening.

- The current inspection criteria will be enhanced to add loss of material, due to corrosion for steel components, and change in material properties, due to leaching of calcium hydroxide and aggressive chemical attack for reinforced concrete. **Accessible** wooden piles and sheeting will be inspected for loss of material and a change in material properties. **Concrete foundations for Station Blackout System structures will be inspected for cracking and distortion due to increased stress level from settlement that may result from degradation of the inaccessible wooden piles.**

- The program will be enhanced to include periodic inspection of the Fire Pond Dam for loss of material and loss of form.

Enhancements will be implemented prior to the period of extended operation.

Operating Experience

The review of program documentation, and other plant operating experience before the program was implemented, identified cracking of reinforced of exterior walls of the reactor building, drywell shield wall above elevation 95', and the spent fuel pool support beam. Cracking of the reactor building exterior walls was generally minor and attributed to early shrinkage of concrete and temperature changes. Engineering evaluation concluded that the structural integrity of the walls is unaffected by the cracks. Repairs to areas of concern were made to prevent water intrusion and corrosion of concrete rebar. The cracks and repaired areas are monitored under the program to detect any changes that would require further evaluation and corrective action.

Cracking of the drywell shield wall was attributed to high temperature in the upper elevation of the containment drywell. Engineering analysis concluded that stresses are well below allowable limits taking into consideration the existing cracked condition. The shield wall cracking was addressed in NRC SEP review of the plant under Topic III-7B. The cracks have been mapped and inspected periodically under the program. Recent inspections identified no significant change in the cracked area.

Cracking of the spent fuel storage pool concrete support beams was identified in mid-1980. Subsequently crack monitors were installed to monitor crack growth and an engineering evaluation was performed. Based on the evaluation results and additional non-destructive testing to determine the depth of the cracks, it was concluded that the beams would perform their intended function, and that continued monitoring with crack monitors is not required. The cracks are examined periodically under the program and have shown little change.

PETITIONERS' EXHIBIT 13

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 ^{0}F to 292 ^{0}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 ^{0}F at the 55 ft elevation to 250 ^{0}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,

Rudolf H. Hausler

PETITIONERS' EXHIBIT 14

Rudolf H. Hausler
8081 Diane Drive
Kaufman, TX 75142
Tel: 972 962 8287
Fax: 972 932 3947

SUMMARY Over 25^+ years planned, conducted, and directed advanced chemical research focused on oil production and processing additives. Acquired expertise in corrosion prevention, chemical inhibition, and materials selection, failure analysis, trouble shooting and economic analysis. Proficient in German, French and Italian.

EXPERIENCE:

1996 - Present **CORRO-CONSULTA** (Dallas TX, and Kaufman TX)

President private Consulting Company

Consulted with major Oil Companies on selection, testing and application of Oil Field Chemicals, primarily corrosion inhibitors.

- Worked on Global Sourcing Team for Mobil Oil Company (major fulltime 6^+ months study)
- Consulted for Mobil Oil Company on production chemical usage at Mobile Bay sour gas production field and prepared for changeover to alternate chemical supplier (two year project).
- Consulted for Arco Oil company
    - on sour production in Middle East
    - reviewed North Slope corrosion data (statistical evaluation)
- Consulted for Mobil Oil Company at major CO_2 flood in Oklahoma (extensive laboratory and field testing - two major publications)
- Consulted with Teikoku Oil Company (Japanese National Oil Company) on various subjects of
    - drill string corrosion
    - amine unit corrosion of 304 stainless steel
    - corrosion of 13%-Cr in sweet production and the chemical inhibition thereof
    - identifying qualified corrosion testing laboratories in the US and athe world
    - application limits for 3% Cr-steels in oil and gas production
- Consulted for Exxon Mobil on new sourcing study for combined Mobile Bay operations. (Developed novel approach for bid procedure and evaluation of bids on purely technical basis. Developed long range approach to streamlining operations with potentially large savings.)
- Consulting for Oxy Permian Ltd. on major gas gathering system (changing from dry gas gathering to wet gas gathering)
- Prepared several major publications (see list of publications)
- Major consulting contract for ExxonMobil in Indonesia
- Consulting with various smaller Producers in the US (incl. Anadarko Petroleum Corp and Swift Energy Company)

- Consulting with various engineering companies
- Consulted with various organization concerned with nuclear safety, including the safety of spent fuel storage casks.

1991 - 1995 **MOBIL Oil Company** (Dallas Research Center), Dallas, Texas

Senior Engineering Advisor

Developed corrosion testing facilities for basic research and to meet specific oil field requirements.

- Planned and developed H_2S corrosion test facility
- Planned safety and wrote safety manual
- Developed unique continuous flow-through corrosion test facility ($$ 1.5MM)
- Developed test protocols and supervised operations of the FTTF
- Extensive consultation with Affiliates on problem solving and chemical usage
- Established supplier relationships and consulted with Affiliates on establishing Enhanced Supplier Relationships
- Developed theory and practice of novel approach to autoclave testing

1979 - 1991 **PETROLITE CORPORATION** St. Louis, Missouri

Research Associate 1986 - 1991

Directed and conducted the development of novel corrosion inhibitors for extreme operating conditions

- New corrosion inhibitor to combat erosion corrosion of carbon steel in gas condensate wells
- Extensive studies on CO_2 corrosion aimed at establishing predictive corrosion model
- Developed the only qualified corrosion inhibitor for nuclear steam generator cleaning (EPRI publication NP-3030 June 1983)

Special Assistant to Executive Vice President 1985 - 1987

Special Assignments focused at support of International Sales

- Extensive travel to secure major accounts in Europe, Russia and East Asia
- Monitored out-sourced R&D in Germany and England

Senior Research Scientist 1979 - 1985

- Developed novel chemical composition under contract with EPRI for corrosion inhibition of cleaning fluids used in nuclear steam generators and methodology of application (only effective formulation still used today)
- Developed unique corrosion model for CO_2 corrosion in oil and gas wells

- Conducted numerous detailed field studies to establish case histories of chemical performance and applications technology

1976 - 1979 **Gordon Lab, Inc.,** Great Bend, Kansas

Technical Director

Responsible for all technical issues involving formulation, application and sales of sucker well production chemicals (corrosion, emulsion, scale, bacteria)

- Conducted failure analysis for customers and developed pertinent reports
- Supervised service laboratory
- Established technical training of sales and support personnel
- Developed technical sales literature and company brochure

1963 - 1976 **UOP (a division of SIGNAL COMPANIES)** Des Plaines, Illinois

Research Associate	1972 - 1976
Associate Research Coordinator	1967 - 1972
Research Chemist	1963 - 1967

To conduct research in electrochemistry, analytical methods development, heat exchanger fouling processes and refinery process additives

- Developed novel organic electrochemical synthesis procedure
- Developed unique (patented) test apparatus for measuring anti-foulant activity
- Introduced statistical design and evaluation of experiments to R&D department and Developed 20 hr course on statistics.
- Developed full 3 credit hour corrosion course to be taught at IIT and DeSoto Chemical Company

EDUCATION

- Ph.D. Chemical Engineering; Swiss Federal Institute of Technology, Zurich Switzerland
- BS, MS Chemical Process Technology, same as above

PROFESSIONAL ASSOCIATION

- American Chemical Society
- The Electrochemical Society
- Society of Petroleum Engineers
- NACE International (Corrosion Engineers)
- American Society fro Metals (ASM)
- Active in NACE on local, regional and national level

RECOGNITION

- NACE Technical Achievement Award (1990)
- NACE Fellow Award 2003

ACHIEVEMENTS

- 17 patents, 58 publications and more than 100 technical presentations
- Registered Professional Engineer (Corrosion Branch, California)
- NACE certified Corrosion Specialist

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

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	)	December 19, 2005

CERTIFICATE OF SERVICE FOR PETITIONERS' EXHIBITS SUPPORTING THE PETITIONERS' COMBINED REPLY

I hereby certify that copies of the following Petitioners Exhibits Supporting Petitioners' Combined Reply of the Petitioners (Nuclear Information and Resource Service, New Jersey Sierra Club, New Jersey Public Interest Research Group, New Jersey Environmental Federation, Jersey Shore Nuclear Watch and Grandmothers, Mothers and Others for Energy Safety) was served this day upon the persons listed below by First Class Mail:

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* Original and two copies

For Michelle Donato
Paul Gunter

Michelle Donato, Esq.

12/19/2005

Date: 12/19/2005