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March 16, 1984

Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U. S. Nuclear Regulatory Commission
Washington, D. C. 20055

Dear Mr. Crutchfield:

Subject: Oyster Creek Nuclear Generating Station (OCNGS)
Docket No. 50-219
Environmental Qualification of Electrical Equipment

During our meeting concerning the subject matter on December 7, 1983, the NRC staff requested GPUN representatives to provide:

1. Resolution of environmental qualification deficiencies at OCNGS identified in a Technical Evalution Report (TER), prepared by Franklin Research Center under contract to the NRC.

2. Justification for continued operation (JCO) for those items to be replaced, modified or evaluated after the current Cycle 10 refueling outage.

3. A list of TMI action plan items (NUREG 0737) to be installed by the end of the current (Cycle 10) refueling outage and identification of their qualification documentation.

4. Confirmation that all design-basis events at OCNGS which could result in a potentially harsh environment, including flooding outside containment, were addressed in identifying safety related electrical equipment.

5. Description of the method used to identify electrical equipment within the scope of paragraph (b)(2) of 10CFR50.49 (i.e., "Nonsafety-related electrical equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions .....").

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6. Identification of electrical equipment and their qualification documentation for post-accident monitoring system as required by Regulatory Guide 1.97.

7. Reasons for extension of replacement or modification to the second refueling outage after March, 1982.

Our responses to these items are provided below.

Resolution of Deficiencies Identified in TER

Attachment I to this letter contains a table which lists proposed solutions for deficiencies identified by the TER for various safety-related components. The table was reviewed in the December 7, 1983 meeting. It has been revised to incorporate comments generated in the meeting and additional information requested by the NRC staff.

Justification for Continued Operation (JCO)

JCO's for those safety related equipment in a harsh environment without complete qualification documentation were provided in Chapter 7 of our report to the NRC dated November 1, 1980. Subsequently, the JCO's were reviewed by Franklin Research Center and were found to be adequate. By our letter dated March 16, 1983 GPUN transmitted the revised Chapter 7 with additional JCO's. The additional JCO's were reviewed in the December 7, 1983 meeting and the NRC staff requested further clarification. The aforementioned TER concludes that some of the equipment which we considered to be qualified, still lacks complete documentation. The staff, therefore, requested JCO's for these equipments. Attachment II to this letter provides the required JCO's for your review.

TMI Action Plan Items (NUREG 0737)

GPUN letter dated October 23, 1981 listed the electrical equipment originally scheduled to be installed during the current Cycle 10 refueling outage in compliance with the NUREG 0737. The letter also listed the electrical equipment installed during the previous outage. Attachment III provides updated status of the NUREG 0737 items that were previously reported in the October 23, 1981 letter. JCO's for operational equipment without complete documentation are given in Attachment II.

Design Basis Events (DBE)

Oyster Creek FDSAR analysis of the DBE LOCA shows that peak drywell temperatures do not exceed 285 °F. This is for a double-ended rupture of a recirculation line with containment spray. The peak containment pressure is about 38 psig which is the saturation pressure at the peak containment temperature. These values are the highest containment temperature and pressure for breaks which occur below the core mixture level. Higher temperature and pressure in a containment atmosphere could be reached when the blowdown is pure steam, since the increased heat capacity of a droplet laden atmosphere reduces superheat conditions. On this basis GPUN performed plant specific analyses for steam line breaks above the core mixture level in determining the containment temperature and pressure profile for environmental qualification of equipment. Methodology and results of the analyses are provided in Chapter 2 of Environmental Qualification Report dated November 1, 1980 which was submitted to you.

Plant specific high energy line break accidents outside containment were also evaluated to identify safety-related equipment which may be exposed to a harsh environment. Detailed discussion and results of the evaluation are given in Chapter 3 of the November 1, 1980 report. An analysis was performed to evaluate the reactor building flood levels for the Oyster Creek Nuclear Generating Station following a high energy line break outside cotainment. Description of the analysis and results are included in Chapter 4 of the November 1, 1980 report. Therefore, the design-basis events and high energy line break accidents at OCNGS were considered in the identification of the saftey related equipments which are essential to mitigate the postulated accidents and to achieve cold shutdown.

Affect of Nonsafety Equipment on Safety Equipment

JCP&L/GPU letter dated October 5, 1979 in response to IE Information Notice 79-22 states that our evaluation of interactions between nonsafety systems and safety systems did not identify any adverse impact which would increase the consequences of any accidents analyzed in the FDSAR.

In addition, GPUN plans to conduct verification of proper selective coordination of protective devices or circuit breakers and fuses on vital buses to ensure that an electrical fault developed in nonsafety systems due to harsh environment will not be transmitted to the safe shutdown systems. This work will be conducted in the first half of the 1984 calendar year as part of the evaluation for the Fire Protection Program (10CFR50 Appendix R).

Isolation of the reactor protection system from nonsafety systems has been reviewed by the NRC staff also in the Systematic Evaluation Program (SEP) for OCNGS (SEP Topic No. VII-1A).

Post Accident Monitoring Equipment (Reg. Guide 1.97, Rev. 2)

As indicated in Attachment III (NUREG 0737 Item II.B.3), four new isolation valves will be installed to meet the Post Accident Sampling capability requirement. Other modifications required by Reg. Guide 1.97 are still under investigation. As soon as the type of modification and electrical equipment involved are determined, GPUN will transmit SCEW sheet for those equipments.

Replacement Schedule

Section (g) of 10CFR50.49 requires licensees to qualify the electric equipment in harsh environment by the end of the second refueling outage after March 31, 1982 or by March 31, 1985, whichever is earlier. The section (g) also states, "The Director of the Office of Nuclear Reactor Regulation may grant requests for extensions of this deadline to a date no later than November 30, 1985, ...". As we have indicated in our previous submittals and in the December 7, 1983 meeting with your staff, we plan to replace parts and components without complete documentation during the second refueling outage after March 31, 1982. The second refueling outage will most likely take place after the March 31, 1985 deadline. However, every effort will be made to replace by March 31, 1985 those parts and components whose replacement activity does not place plant operation in an unsafe condition .

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

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cc: Administrator
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NRC Resident Inspector
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ATTACHMENT 1

SPECIFIC EQUIPMENT EQ DEFICIENCIES O.C.

TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
1,3,8 9,10	Motorized Valve Actuator V-17-54, V-16-1, V-17-19 V-14-30, 31, 32, 33, 34, 35, 36, 37	II.A	Documentation, Similarity, Qualified Life, Spray, Steam Exposure, Radiation	Units will be replaced this outage w/Qualified Limitorque Model.
2,6,7	Motorized Valve Actuator V-20-15, 21, 40, 41 V-21-1, 3, 5, 7, 9, 11	II.A	Documentation, Qualified Life, Radiation	Limitorque's Report #B0058, which will be referenced in the SCEW sheet, describes the generic qualification and qualified life of subject actuator. Limitorque's Report #B0003 includes Radiation exposures.
4	Motorized Valve Actuator V-16-2, 14 V-16-61	II.C	Qualified Life	V-16-2 & 14 will be replaced this outage w/Qualified Limitorque Model. V-16-61 is equipped w/Reliance Class B Motor, instead of Peerless Class B as mentioned in the TER. Limitorque's Report #B0058, which will be referenced in the SCEW sheet, addresses the qualified life of subject actuator.
5	Motorized Valve Actuator V-17-1, 2, 3 V-17-55, 56, 57	II.A	Qualified Life, Radiation	V-17-1,2,3 will be replaced this outage w/Qualified Limitorque Model. V-17-55,56,57 requires additional Documentation for Peerless Class B DC Motor. See Attachment II for JCO.

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TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
11	Motorized Valve Actuator V-5-166, 148	II.A	Documentation, Qualified Life, Spray	Actuators are equipped with Reliance Class RH A.C. Motors. Limitorque's Report #B0058, which will be referenced in the SCEW sheet, describes the generic qualification and qualification tests. Chemical Solution (Sodium Chromate) will be replaced w/demineralized water.
12	Motorized Valve Actuator V-1-106, 107	II.A	Documentation, Similarity	This motor is a Reliance Class RH instead of Class B as mentioned in the TER. Limitorques Report #'s 600456 and B0058 will be referenced in the SCEW sheet.
13,15	Motorized Valve Actuator V-21,13, 17	II.A	Qualified Life, Radiation	Additional Documentation for Peerless Class B D.C. Motor is required. See Attachment II for JCO.
14	Motorized Valve Actuator V-5-167, 147	II.C	Qualified Life	Limitorque's Report #B0058, which will be referenced in the SCEW Sheet, addresses the qualified life of subject actuator.
16,17,18 19,20	Solenoid Valve V-24-29 NS03A, B NS04AL1, L2, L3 NS04BL1, L2, L3	II.C	Qualified Life	ASCO Report #AQR-67368/Rev. 0, which will be referenced in the SCEW Sheet, addresses the qualified life of subject valve.

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TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
21	Solenoid Valve V-38-9, 10, 16, 17	I.B	Evaluation of Aging Degradation, Qualified Life, Program to Identify Aging Degradation	Replaced Age Sensitive Non-Metallic Parts this outage.
27	Solenoid Valve V-26-16, 18	II.C	Qualified Life	The qualified life was covered in reference document, Wyle Report No. 17451-13.TER evaluation (on page 5f) does not apply.
22,23,24 25,26,28 31,35,36	Solenoid Valve V-23-13, 15, 16, 17, 18 19, 20, 21, 22 V-27-1, 2, 3, 4 V-28-17, 18, 47	I.B	Documentation	Replace w/Qualified Valve next outage.
29,30,32 33,34	Solenoid Valve V-38-22, 23 V-31-2 V-24-30 V-22-1, 2, 28, 29 V-11-34, 36	I.B	Documentation	Replaced this outage with Qualified ASCO Valve.
37	Solenoid Valve NR-108 A,B,C,D,E	II.A	Evaluation of Aging Degradation, Qualified Life, Radiation	Additional Documentation and evaluation.
38,39,40 41,42,43 44,45	Pressure, Level, Flow Transmitter ID46 A,B; ID45 IP05 A,B,C,D; IA12 ID13 A,B; IP07 IG06 A,B; RV26 A,B IP03 A,B	I.B	Documentation	Replace with Qualified Transmitter next outage.

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SPECIFIC EQUIPMENT EQ DEFICIENCIES O.C.

TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
46,48,49 50,53,54 55,56,57 58,60,61 62,63	Pressure, Level Switch RE23 A,B,C,D; RE17 A,B,C,D RE15 A,B,C,D; RE03 A,B,C,D RE05 A,B; RE22 A,B,C,D,E RE18 A,B,C,D; RE05-19 A,B RE02 A,B,C,D; RV46 A,B,C,D IA83 A,B,C,D,E; IP15 A,B,C,D IB11-A1,A2,B1,B2; IB05-A1,A2,B1,B2	I.B	Documentation	Replace with Qualified Analog Trip System next outage
47	Pressure Switch PS-153	II.A	Evaluation of Aging Degradation, Qualified Life, Radiation	Environmental Qualification not required. The automatic bypass design feature in the control logic for venting the drywell on high N_2 Pressure was eliminated by replacing the existing switch with a spring return switch. This was done in order to ensure that deliberate operator action is required to open the drywell vent valves after the isolation signal has been reset.
51,52	Pressure Switch RV29 A,B,C,D RV40 A,B,C,D	I.B	Documentation	Replace w/Qualified Pressure Switch next outage.
59	Level Switch RD08 A,B,C,D,E,F	I.B	Documentation	Replaced this outage w/Qualified Level Switch.
64	Limit Switch NS04A-1,-2 NS04B-1,-2	I.B	Documentation	Replaced this outage w/Qualified Limit Switch.

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SPECIFIC EQUIPMENT EQ DEFICIENCIES O.C.

TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
65	Temperature Switch IB10 A thru P	II.A	Similarity, Adequate Pressure, Adequate Steam Exposure	The referenced document, Wyle Reports No. 17451-18 and No. 43854-1, provides all the necessary information which established the specific relationship between the tested switch model and installed unit. In addition, recent Wyle letter (which will be referenced in the SCEW sheet) outlined the applicable portions and photographs from the referenced reports about the similarity of the switch and verified that subject switch's body and wirings were exposed to steam environment during the LOCA testing. A re-evaluation of the pressure requirements in the Main Steam Tunnel area, where IB-10E thru P switches are located, reveals that the pressure will be about 18.2 psia following accident condition. This information is found in EDS Report No. 02-0990-1085, Rev. 0 dated July 1981, will be referenced in the SCEW Sheet.

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SPECIFIC EQUIPMENT EQ DEFICIENCIES O.C.

TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
66	Temperature Switch IB06A,B,C,D	I.B	Documentation	In 1979, Jersey Central Power and Light Company (JCP&L) performed a high energy line break (HELB) analysis of the Oyster Creek Emergency Condenser System (ECS) piping outside containment and concluded that a pipe break could cause damage to the ECS isolation valves and controls. JCP&L provided this conclusion to the NRC. The NRC (SEP Branch) performed an on-site inspection as a part of the evaluation of the SEP Topic No. III-5B, confirmed JCP&L's findings, and requested JCP&L to provide adequate protection against the effects of a postulated HELB. GPUN (now licensed operator for the OCNGS) performed and submitted an analysis to demonstrate that the ECS piping would leak before a significant break could occur. During the integrated assessment of the SEP topics, the NRC staff accepted the result of the analysis and requested GPUN to provide leak detection capability (i.e., visual inspections or automated devices). GPUN is currently evaluating the type of the capability to be utilized. Since GPUN will provide improved capability of an early ECS leak detection, the subject temperature switch is no longer needed.

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SPECIFIC EQUIPMENT EQ DEFICIENCIES O.C.

TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
67	Electric Motor NZ01-A,B,C,D	II.C	Qualified Life	Lubrication changeout is covered by Plant PM program.
70	Electric Motor 1-1 1-2 1-3 1-4	II.A	Steam Exposure	Motors are located inside the corner rooms. There are no steam lines in corner rooms. These motors will not be exposed to steam environment. TER evaluation (page 5F) does not apply.
71	Terminal Block TB#'s 63-242 63-246 22-389 22-390 71-412 22-640 22-641	I.B	Documentation, Evaluation of Aging Degradation, Qualified Life, Steam Exposure, Spray, Radiation	Replaced with Qualified Block this outage.
72	Electrical Penetration X10, X13, X18	II.A	Aging Degradation, Qualified Life Spray Radiation	Additional Analysis and documentation.
73,74	Motor Control Centers DC-1, 1A21B, 1AB2, 1B21A, 1B21B	II.A	Documentation	Additional Analysis.
75	Motor Control Center DC-2	II.A	Documentation	This equipment is located in floor El. 75' in about the same area where the temperature switches under TER No. 66 are located. Therefore, the proposed solution described under TER No. 66 also applies.

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TER NO.	COMPONENT	NRC CAT.	DEFICIENCY	PROPOSED SOLUTION
80	Electrical Cable Rockbestos Firewall EP	II.A	Documentation	The Rockbestos Report No. QR 1804 will be referenced in the SCEW sheet.
81	Electrical Cable Tensolite	II.A	Documentation, Similarity, Aging Degradation, Qualified Life, Radiation	The E.I. Dupont Report dated August 1, 1974, "Tests of Electric Cables Insulated and Jacketed With TEFZEL 280 Flouropolymer Under IEEE 383-1974," will be referenced in the SCEW Sheet.
82	Electrical Cable Kerite	II.A	Documentation	Franklins Report #'s F-C2770 dated October 1970 and F-C2737 dated April 15, 1970 will be referenced in the SCEW Sheet.
N/A	Temperature Switch IP18A IP18B	N/A	See Attachment II for JCO.	

ATTACHMENT II
JUSTIFICATION OF CONTINUED OPERATION

TER NO.

V-17-55	Shutdown Cooling Valves
V-17-56	" " "
V-17-57	" " "

These valves are installed at the discharge side of the shutdown heat exchangers respectively. If these valves should fail, the alternate shutdown cooling method is to direct the flow to the main condenser by way of the cleanup system letdown and maintaining reactor water level using the condensate system via the feedwater string(s) to makeup to the reactor vessel.

Currently, another shutdown cooling method is being developed which will include the Electromatic Relief Valves. If this method becomes official and supersedes the preceding, we shall advise accordingly.

TER No. 13, 15

V-21-13 Containment Spray Test Valves
V-21-17 " " " "

These are the Containment Spray System dynamic test valves under each system loop respectively. They are normally closed and are used for full-flow testing of the Containment Spray System without wetting the drywell. The flow from these valves is directed to the suppression chamber through connections into the vacuum breaker line.

The operating circuits of these valves are interlocked so that both loops can not be in the test position at the same time. Each loop has the heat removal capacity to hold primary containment pressure below the design pressure of 62 psig, and to reduce the pressure to essentially atmospheric within about 8 days following the accident. Also, the control circuitry for the containment spray system provides automatic reset from dynamic test to automatic start readiness when process conditions indicate impending need for the containment spray.

If any of the test valves fail to close while the containment spray system is on, the net flow of that loop will be reduced by about 20%. However, the flow of one containment spray loop in either loop is more than ample to provide the necessary heat removal capacity.

ADDITIONAL ITEM (not covered by TER)

IP-18-A	Containment Spray Temperature Switches
IP-18-B	" " " "

The containment spray system consists of two independent full-capacity cooling loops. Either loop is capable of removing the fission product decay heat from the containment.

The containment spray temperature switches, located outside the Drywell at different locations, are used to sense the water temperature from the heat exchangers in loops I and II respectively, as a failure monitor. Failure of the temperature switch of start loop will automatically disable the containment spray pump of that loop. The containment spray pumps of the standby loop can be manually started using their respective controls in the Control Room.

ADDITIONAL ITEM (Not covered by TER)

NUREG 0737 Item II.D.3
Direct Indication of Relief and Safety Valve Position

These acoustic monitoring systems were operational at the OCNGS prior to this NUREG requirement which includes environmental qualification. The environmental qualification will be established by the B&W Owner's Group Test Program, in which the OCNGS is a participant.

The testing has been concluded and the final report and recommendations are scheduled for release in the first quarter of 1984. The results of the testing show that the basic components are satisfactory for in containment LOCA and MSLB. However, some additional protection of the driver/amplifier and connections to it probably will be required at the OCNGS.

For the relief valves there are also position indicating switches with Control Room displays. For the safety valves there are temperature readouts in the Reactor Building which indicate if a safety valve has lifted.

ADDITIONAL ITEM (not covered by TER)

This is in addition to previously submitted JCO No. 51 - Torus Vacuum Relief System.

a) IP-12 Pressure Transmitters
PT-52

These transmitters are physically located in different locations outside the Drywell. The cables and conduits run separately, and power supply to these transmitters comes from two different sources.

b) DPS-66A Pressure Switch
DPS-66B

These switches control vacuum breaker valves V-26-16 and V-26-18 respectively to prevent excessive vacuum in the suppression chamber.

If both switches should fail under a single failure situation, the Control Room Operator can monitor the pressure in the suppression chamber with the Torus Pressure indication device (IP13) and operate the vacuum breaker valves manually with the Control Switch at the 11F panel.

ATTACHMENT III

TMI ACTION PLAN, NUREG 0737 ITEMS

NUREG 0737 Item II.B.3
Post Accident Sampling Capability

Of the four solenoid valves required, one, V-40-6, has been installed, but is not operable. The remaining valves will be installed consistent with our post accident system operational commitment. These four valves are environmentally qualified and SCEW sheets will be submitted.

NUREG 0737 Item II.D.3
Direct Indication of Relief and Safety Valve Position

The environmental qualification will be established by the B&W Owner's Group Test Program, in which OCNGS is a participant.

The testing has been concluded and the final report and recommendation are scheduled for release in the first quarter of 1984. The results of the testing show that the basic components are satisfactory for in containment LOCA and MSLB. However, some additional protection of the driver/amplifier and connections to it probably will be required at the OCNGS.

NUREG 0737 Item II.E.4.1
Dedicated Hydrogen Penetrations

GPUN required exemption of this item. Refer to the letter dated December 15, 1982.

NUREG 0737 Item II.F.1 Subparts (1) through (6)
Additional Accident Monitoring Instrumentation

These items will be operable by the end of the Cycle 10 refueling outage. They are fully qualified and the applicable SCEW sheets will be submitted.

NUREG 0737 Item II.K.3.19
Interlock on Recirculation Pump Loops

This item will be installed during Cycle 11 refueling outage.