GPU Nuclear

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Writer's Direct Dial Number:

March 16, 1983

Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Crutchfield:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Safety Evaluation Report for Environmental
Qualification of Safety-Related Electrical
Equipment

Your letter dated November 30, 1982 to P.B. Fiedler transmitted the Safety Evaluation Report (SER) and Technical Evaluation Report (TER) for Environmental Qualification of Safety-Related Electrical Equipment at Oyster Creek Nuclear Generating Station.

Your letter requested that GPU Nuclear Corporation (GPUNC) reaffirm the previously submitted justification for continued operation (JFCO) and within thirty (30) days of our receipt of your letter, submit information for items in NRC categories 1B, 2A, and 2B for which JFCO was not previoulsy submitted to the NRC. In our recent phone conversation with your staff, we requested an extension of our response to the SER by approximately one month. Our revised JFCO is attached to this letter as Revision 1 to Chapter 7 of our December 28, 1980 submittal on environmental qualification. Also, in Section 3 of Appendix D to the TER it is stated that there are no additional items requiring JFCO. Based upon the above consideration, GPU reaffirms the JFCO.

Your letter also requested that GPUNC inform the NRC, as indicated in the proprietary section of the Safety Evaluation Report, whether any portions of the identified pages still require proprietary protection. Review of our previously submitted information indicates that none is classified as proprietary. However, Franklin Research Center (FRC) has attempted to obtain some information from secondary sources (vendors, etc.) which is indicated as proprietary and used in the subject SER for the Oyster Creek Nuclear Generating Station. It is our position that the burden of responsibility for the proprietary nature of this material rests with the NRC and its contractor, FRC.

A048

The subject SER requested verification that the containment spray system is not subjected to a disabling single component failure (Section 4.3.3.2 of the FRC TER). Our investigation shows that redundancy (both physical installation and power supply) is provided for the containment spray system to avoid a single component failure that would prevent remote-manual initiation of containment spray.

GPUNC plans to complete replacement or qualification of unqualified equipment or subcomponents as described in the previously submitted System Component Evaluation Work Sheet (Rev 1) by the end of the Cycle 11 refueling outage (which is the second refueling outage after March 31, 1982). Installation of the environmentally qualified equipment, as required by NUREG 0737 (TMI Action Plan), will also be completed by the end of the Cycle 11 outage.

In our telephone conversation with your staff on January 31, 1983, we requested clarification concerning steam exposure, applicability of qualification report, etc., as indicated in TER. We were told by the NRC staff that a meeting will be arranged in the near future to clarify these issues.

Very truly yours,

Peter B. Fiedler
Vice President and Director
Oyster Creek

PBF:jal
Attachment

cc: Ronald C. Haynes, Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, NJ 08731

CHAPTER 7

OYSTER CREEK NUCLEAR GENERATING STATION

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

JUSTIFICATION FOR CONTINUED OPERATION WITH EQUIPMENT THAT DOES NOT HAVE COMPLETE QUALIFICATION DOCUMENTATION

As indicated on the System Component Evaluation Work Sheets (Chapter 6), the equipment that lacks adequate qualification documentation will be qualified through further document searches, replaced with qualified or to be qualified equipment, or qualified through test, analysis, etc. This chapter provides the justification of the interim use of existing equipment until it is either qualified or replaced with qualified equipment.

NOTE: Equipments identified with an asterisks(*) indicate that equipment is not required to mitigate the consequences of an accident outside of containment or to achieve a safe shutdown for that accident. For a break inside containment, asterisked items are needed to mitigate the accident, however, the environmental conditions for these asterisked items would be normal ambient conditions.

1. Automatic Depressurization System (ADS) Pressure Switches

   IA83A

   IA83B

   IA83C

   IA83D

   IA83E

The pressure switches will open the electromatic relief valves in the Automatic Depressurization System on an overpressure condition in the reactor pressure vessel. Each pressure switch is installed at a different location outside the Drywell and a single high energy line break in the vicinity will not subject all five switches to a peak temperature and pressure at the same time. These switches are necessary only for over-pressurization protection and their failure does not affect the ability of the Control Room operator to manually operate the ADS valves in order to achieve a controlled cooldown. Even without the relief valves, reactor vessel overpressure protection is provided by sixteen (16) safety valves located inside containment and will be unaffected by any HELB's outside containment.

2. Drywell Vent and Purge Valves

   V-26-16*

   V-26-18*

   Qualified Equipment

3. Containment Spray Valves

   V-21-5*

   V-21-11*

   Qualified Equipment

4. Reactor Building Closed Cooling System Isolation Valves

   V-5-167*

   V-5-147*

   Qualified Equipment

5. Containment Spray Valves

V-21-13 *

V-21-17 *

V-21-3 *

V-21-9 *

V-21-1 *

V-21-7 *

Qualified Equipment

6. Drywell Hi-Pressure Scram Switch

RE-04A*

RE-04B*

RE-04C*

RE-04D*

These switches are installed just outside the drywell wall and monitor the pressure inside the Drywell. These switches are only used to detect a HELB or LOCA inside containment and will not be subjected to the harsh environment that they are required to sense.

7. Reactor Vessel Pressure Transmitter

ID-45

ID-46A

ID-46B

These transmitters provide reactor vessel pressure indication to the Control Room operator. They do not provide a safety function and their failure can not hinder the actuation of the Auto Depressurization System and/or the Core Spray System.

8. Isolation Condenser Level Transmitter

IG-06A

IG-06B

These transmitters provide the Control Room operator with isolation condenser water level indication. If these transmitters should fail the Isolation Condenser System can accommodate the reactor decay heat for up to 1 hour and 40 minutes without need for make-up water. If only one condenser is available, it can accommodate reactor decay heat up to 45 minutes after a scram from full power before make-up water is required. The reactor can also be depressurized by using the Auto Depressurization System and cooled by using the Core Spray System. These two systems will not be adversely affected by the same HELB that IG-06A, B will be subjected to.

9. Reactor Isolation Temperature Switches

IB-10 (A thru P)

Qualified Equipment

10. Reactor Water Level Transmitter

ID-13A

ID-13B

These transmitters provide reactor water level indication to the Control Room operator. They do not perform any safety functions and their failure will not hamper other water level indicators/alarms or SCRAM signals.

11. Core Spray Pressure Switch

RV-29A

RV-29B

RV-29C

RV-29D

These switches are used in the Auto Start circuits of the Core Spray pumps. If these switches should fail, the Control Room operator can manually start the pumps.

12. Core Spray Pressure Switches

RV-40A

RV-40B

RV-40C

RV-40D

These switches are used in the Auto Start circuits of the Core Spray pumps (booster pumps). If these switches should fail, the booster pumps can be started manually by the operator.

Flow Transmitters

RV-26A

RV-26B

ese tranmitters only provide indication to the Control Room of flow in the Core Spray System for either tests or actual use. If they should fail, other reactor vessel instrumentation, e.g. reactor water level indication, could be used to determine if core spray is functioning.

13. Isolation Condenser Area Temperature Detectors

IB-06-A

IB-06-B

IB-06-C

IB-06-D

The isolation condenser area temperature monitors provide indication in the control room of steam leaks in the area. These temperature detectors do not provide any automatic safety functions, but are referred to in the station emergency procedures as one of the parameters that can be used to detect leaks in the isolation condenser system. Since the system is primarily there to detect leaks not breaks it is unlikely that the area temperature will reach those levels described in the worst case break analysis.

14. Containment Spray Flow Transmitter

IP-03-A *

IP-03-B *

The Containment Spray flow transmitters are used by the control room operator to verify that the containment spray system is delivering its required flow. The containment spray system would be used if there had been an inside containment HELB or LOCA or the torus had to be utilized as a heat sink in order to achieve safe shutdown. Also, this system maybe used if the Drywell has reached its design temperature due to a loss of Drywell cooling. It should be noted that these instruments provide only indication and do not

perform any automatic safety functions. Even considering the loss of this indication, the operator has various other backup parameters that will verify adequate system flow. They are: containment spray motor amperes, pump discharge pressure, torus temperature and valve position.

15. Containment Pressure Switches

IP15-A*

IP15-B*

IP15-C*

IP15-D*

These switches monitor the drywell pressure and provide one of two auto start signals required to actuate containment spray. These switches are located outside the drywell (containment) and are only used to mitigate loss of Drywell cooling, a HELB or LOCA inside containment, therefore they will not be subjected to the harsh environment that they are required to mitigate. If these switches should fail, there are other indications of a HELB or LOCA in containment and the operator has the opportunity to manually actuate containment spray.

16. Drywell Pressure Transmitter

IP-07*

This transmitter only provides drywell pressure indication to the control room. It is located outside the drywell, and therefore it will not be subjected to the HELB or LOCA in containment that it is sensing. If this transmitter should fail, the operator has other means of detecting a HELB or LOCA in the drywell, e.g. drywell sump level sensor and transmitter, drywell radio gas monitor, drywell radio particulate monitor, drywell and suppression pool pressure indicators and recorder, drywell temperature recorders, suppression pool level indications and recorders.

18. Drywell Pressure Switch

RV-46-A*

RV-46-B*

RV-46-C*

RV-46-D*

These switches monitor the drywell pressure and provides an auto start signal required to actuate core spray. These switches are located outside the drywell and are used to sense an accident inside containment. Therefore they will not be subjected to the harsh environment that they are required to mitigate. If these switches should fail, there are other signals to automatically or manually start core spray, e.g. reactor water level.

19. MSL Low Pressure Switch

RE 23-A

RE 23-B

RE 23-C

RE 23-D

Qualified Equipment

20. Main Steam Line High Flow Switch

RE 22A

RE 22B

RE 22C

RE 22D

RE 22E

RE 22F

RE 22G

RE 22H

These switches, which are located outside containminment, monitor the main steam lines flow. They will remain in ambient conditions during any of the postulated accidents and the 40 year plus 1 year post accident radiation dosage is 6.1×10^4 R. It is unlikely that all of these switches will fail to perform their function in the event of an accident.

21. Isolation Condenser ΔP Switch

IB-05A1

IB-05A2

IB-05B1

IB-05B2

IB-11A1

IB-11A2

IB-11B1

IB-11B2

These switches provide automatic valve closure on the isolation condenser system given a detected pressure change (line break). If these switches fail before their time delay expires due to the postulated HELB, there are other means for the operator to determine an isolation condenser HELB and manually close all valves, e.g. reactor pressure, radiation monitor and reactor water level instruments.

22. Core Spray Pressure Switches

RE-17-A

RE-17-B

RE-17-C

RE-17-D

These pressure switches monitor reactor pressure and are interlocked with the core spray auto initiation logic to prevent core spray injection valves from opening until reactor pressure is 285 psig decreasing. If these switches should fail, the operator can manually open the core spray injection valves from the Control Room.

23. Reactor Pressure Switch

RE-15-A

RE-15-B

RE-15-C

RE-15-D

These switches automatically trip the recirculation pumps and initiate the isolation condenser system on high reactor vessel pressure. Switches RE-15A and B are located in RK-01 and RE-15C and D are located in RK-02. Therefore, only two of these switches will be subjected to the harsh environment of a HELB while the other two will see relative ambient conditions.

24. Reactor Pressure Switch

RE-03-A

RE-03-B

RE-03-C

RE-03-D

These pressure switches are the switches used to provide a scram signal on reactor high pressure. This is not the scram signal that would be utilized to shutdown the reactor in the event of a rupture of either the Emergency Condenser or the cleanup system (the HELB's that will effect these switches).

25. Reactor Water Level Switch

RE-05-A

RE-05-B

These water level switches along with RE-05/19A and RE-05/19B provide a scram signal on low water level. These switches are supplied with redundant power supply and physically separated. The areas where the switches are located are monitored by area temperature detectors. These detectors will warn the control room operator of leaks in those systems long before the pipes rupture. This will enable the operator to isolate the leak before the harsh environment is established.

26. Reactor Water Level Switch

RE-02-A

RE-02-B

RE-02-C

RE-02-D

These switches provide an auto start signal to core spray, provide a containment isolation signal, provide a reactor isolation signal and provides one of the signals required for an automatic containment spray start.

These switches are redundant and located in separate areas. These areas are monitored by area temperature detectors, which will warn the control room operator of leaks in the clean-up systems long before the pipes rupture. This will enable the operator to isolate the leak before the harsh environment is established.

27. Purge Valves and Nitrogen Valves

V-27-1*

V-27-2*

V-27-3*

V-27-4*

V-23-13*

V-23-14*

V-23-17*

V-23-18*

These containment isolation valves are normally closed during plant operation and will not change position given a failure of the solenoid valve. They will not see the environmental effects of the HELB/LOCA that they are required to mitigate.

28. Nitrogen System Valves

V-23-15*

V-23-16*

V-23-19*

V-23-20*

These containment isolation valves are normally closed during plant operation and will not change position given a failure of the soleroid valve.

They are in a non harsh temperature/pressure environment for the HELB/LOCA in containment which they are to mitigate.

29. Particulate Monitor System, O_2 Analyzer System and Torus Sample System Valves

V-38-16*

V-38-17*

V-38-9*

V-38-10*

V-38-22*

V-38-23*

These valves will remain in an ambient environment for the HELB/LOCA inside containment they are required to mitigate. If these valves should fail, they will fail closed which is the desired position.

30. Ventilation Valves

V-23-21*

V-23-22*

V-28-17*

V-28-18*

V-28-47*

These are containment isolation valves that are normally closed during plant operation and will not change position given a failure of the solenoid valve. They will not see the harsh environment of the HELB/LOCA that they are required to mitigate and it is unlikely that they will not be able to perform their required function.

31. Reactor Isolation Temperature Switches

IB-10

Qualified Equipment

32. Core Spray Pumps

NZ-01-A

NZ-01-B

NZ-01-C

NZ-01-D

Qualified Equipment

33. Containment Spray Pumps

1-1

1-2

1-3

1-4

The HELB that will adversely affect these pump motors is outside containment. These pump motors are used to mitigate an accident inside containment. Therefore, these motors will not see the harsh environment that they are required to mitigate.

34. Containment Spray Differential Pressure Transmitter

IP-05A*

IP-05B*

IP-05C*

IP-05D*

The purpose of these Differential Pressure transmitters is to detect tube leaks in the Containment Spray heat exchangers. These leaks might provide a potential leakage path to the environment of radioactive effluent. This component does not provide any automatic function and only serves to provide an alarm in the control room. They will remain in an ambient environment for the HELB/LOCA in containment in which this system will become of use. Also, it is not expected that the containment spray heat exchangers tubes would leak, since they were retubed with titanium in the spring of 1980. This material has proved to be highly resistant to corrosion in other similar applications at Oyster Creek.

35. MSIV Solenoid Valves

NS-04A-L1, L2, L3

NS-04B-L1, L2, L3

Qualified Equipment

MSIV Position Indicators

NS-04A-1 & 2	Outside	NS-03A-1 & 2	Inside
NS-04B-1 & 2	Containment	NS-03B-1 & 2	Containment

Position Indicators

The MSIV position indication switches are utilized to provide a scram signal when the MSIV's are less than 90% open. In the event the outside containment MSIV position switch did not provide a scram signal, two scram signals would still be available to ensure the reactor was shutdown

immediately for a main steam line break. One is the MSIV position switch signal from the inside valves and the other is the reactor high pressure and/or reactor low water level signal, both of which would not be affected by the HELB that affects the outside containment MSIV position switches.

36. Cleanup Valves

V-16-2

V-16-14

V-16-61

Qualified Equipment

37. Reactor Water Sample Valves

V-24-30*

This valve is the outside containment isolation valve for the reactor coolant sample line. It is located in the area monitored by area temperature detectors. These detectors will warn the control room operator of leaks in the cleanup systems long before the pipes rupture. This will enable the operator to isolate the leak before the harsh environment is established. The redundant valve inside containment is environmentally qualified valve.

38. Shutdown Cooling Valves

V-17-1*

V-17-2*

V-17-3*

V-17-55*

V-17-56*

V-17-57*

Qualified Equipment

39. Drywell Sump Discharge Valves

V-22-1*

V-22-2*

V-22-28*

V-22-29*

These valves are the containment isolation valves for the drywell equipment drain tank and sump. These valves do not see a harsh temperature/pressure environment for any postulated HELB's. Also, it should be noted that these valves are not needed for isolation purposes for breaks outside containment. And if these valves should fail, they will fail closed which is the desired position.

40. Core Spray Valves

V-20-15

V-20-40

Qualified Equipment

41. PS-153. Deleted.

Disconnected in conjunction with plant modification #528-80-3 (SROC No. 81-16.1).

42. Core Spray Booster Pumps

NZ-03-A

NZ-03-B

NZ-03-C

NZ-03-D

Only two of these pump motors will be affected by a HELB. Even if one of these pumps should fail, the core spray system can still function.

43. Core Spray Valves

V-20-21

V-20-41

Qualified Equipment

44. Emergency Condenser Valves

V-14-30

V-14-31

V-14-32

V-14-33

V-14-34

V-14-35

Qualified Equipment

45. Emergency Condenser Makeup Valves

V-11-34

V-11-36

These valves provide make up to the isolation condensers. With the minimum water level permitted by technical specifications the emergency condensers will be available to remove heat at their design capacity without uncovering the heat exchanger tubes for 1 hour 40 minutes with both condensers available and 45 minutes if only one condenser is available.

The Emergency Condenser System is one of the methods available to control reactor pressure and cooldown the plant following a HELB. Since the emergency condenser line break is the break that causes the harsh environment it is likely that one of the alternate cooldown methods would be utilized.

In the area of the emergency condensers there are area temperature detectors that will detect leaks in the emergency condenser system and annunciate this in the control room. By procedure the control room operator would isolate the affected system before a rupture developed. Therefore, the actual temperature/pressure environment would not reach the levels indicated in the worst case analysis. And these valves will most likely be usable if the isolation condenser system is available for use.

46. Reactor Water Level Switches and Reactor Water Level Switches/Transmitters

RE-18-A

RE-18-B

RE-18-C

RE-18-D

RE-05/19-A

RE-05/19-B

The RE-18 switches provide a low-low-low (triple low) signal to the automatic depressurization circuit. This signal could be necessary if there was a small break that required a rapid depressurization in order to permit core spray injection. The breaks that cause the harsh environment for

these switches does not require the use of the Automatic Depressurization System. It should be noted that regardless of the condition of the RE-18 switches the electromatic relief valves can be manually operated by the control room operator if he desires to use them for blowdown.

The RE-05 switches along with the RE-05/19 switches/transmitters provide a reactor high pressure scram signal and control room water level indication. They are redundant and physically separated and adversely affected by two different HELB's. These HELB areas are monitored by area temperature detectors. These detectors will warn the control operator of leaks in those systems long before the pipes rupture. This will enable the operator to isolate the leak before the harsh environment is established.

47. Deleted

48. Limitorque Valve Actuators Inside Containment

V-14-36, 37

V-17-19, 54

V-16-1

Qualified Equipment

49. Head Cooling System Isolation Valve

V-31-2

The purpose of this valve is to provide reactor coolant boundary isolation. This valve is used if the head cooling system was needed to ensure that the Technical Specification limit of vessel flange to head temperature

of 200 degrees F was not violated during normal plant cooldown. This valve is normally closed and fails closed of loss of air or power. Therefore, this valve should function properly in the event of an accident.

50. Scram Discharge Valve Level Switches

RD-08-A

RD-08-B

RD-08-C

RD-08-D

RD-08-E

RD-08-F

These switches provide for alarm, rod block and a reactor scram on a sensed high water level in the instrument scram discharge volume. These components are located in an area that does not see a harsh temperature and pressure environment. Also the switches do not provide a primary safety function in the event of a HELB inside or outside containment. They do serve to back up the signal which provides the reactor scram (hi drywell pressure or low water level). The only possible adverse effect that the failure of this switch might create is to allow a scram reset with a significant level of water in the instrument volume. This would require a deliberate action by the Control Room operator in violation of station emergency procedures.

REFERENCES

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    Chapter Entitled "Use of Plastics and Elastomers
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15. Letter from L. L. Blake, Jr. (ITT Barton Instrument) to Y. Nagai
    (JCP&L) dated August 19, 1980.

16. Letter from R. Farrell (ASCO) to Y. Nagai (JCP&L) dated October 22,
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17. Letter from R. Matthews (ASCO) Y. Nagai (JCP&L) dated August 26, 1980.

18. Letter from R. King (Transamerica Delaval-Berksdale) to R. K. Pruthi (GPU) dated August 21, 1980.

19. Letter from R. King (Transamerica Delaval-Berksdale) to R. K. Pruthi (GPU) dated September 16, 1980.

20. Letter from M. Kosciak (Fenwall Inc.) to R. K. Pruthi (GPU) dated August 19, 1980.

21. Letter from H. P. Hartman (Static-O-Ring) to R. K. Pruthi (GPU) dated September 2, 1980.

22. Letter from G. W. Spear (Atkomatic Valve Co.) to R. K. Pruthi (GPU) dated September 23, 1980.

23. Letter from A. L. Gawrych (Mercoid Corp.) to R. K. Pruthi dated August 20, 1980.

24. Letter from J. Woods (Magnetrol International) to E. T. Banua (JCP&L) dated September 16, 1980.