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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION RELIEF REQUESTS

GPU NUCLEAR CORPORATION

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NUMBER 50-219

1.0 INTRODUCTION

Technical Specification 4.3.B for the Oyster Creek Nuclear Generating Station states that the surveillance requirements for Inservice Inspection and Testing of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, 2, and 3 components shall be applicable as follows: Inservice Inspection of ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i).

By letter dated September 14, 1990, GPU Nuclear Corporation (GPUN, the licensee) submitted five requests for relief from ASME Code Section XI requirements that the licensee has determined to be impractical for the second 10-year interval. As a result of review of this submittal, a conference call was held with the licensee to obtain additional information regarding request for relief Attachment III. The requested information was submitted by the licensee in a letter dated January 11, 1991.

Two additional requests for relief were received in a submittal dated December 7, 1990. These relief requests are also evaluated in this document.

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated these requests for relief from certain ASME Code requirements determined to be impractical for the Oyster Creek Nuclear Generating Station during the second inspection interval.

2.0 EVALUATION

The information provided by the licensee in support of requests for relief from impractical requirements has been evaluated and the bases for granting relief from those requirements are documented below. Unless otherwise stated, reference to the Code refers to the ASME Code, Section XI, 1980 Edition, Winter 1981 Addenda.

2.1 September 14, 1990 Submittal, Attachment I: Hydrostatic Testing of Class 2 Main Steam Lines Between the Outboard Main Steam Isolation Valve and the Turbine Stop Valve

Code Requirement: Section XI, Subarticle IWC-5222, System Hydrostatic Test, requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with design temperatures of 200°F or less, and at least 1.25 times the system pressure for systems with design temperatures above 200°F. The system pressure shall be the lowest pressure setting among the safety or relief valves provided for overpressure protection within the boundary of the system to be tested.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of each main steam line between the outboard main steam isolation valve (MSIV) and the turbine stop valve to 1.25 times the design pressure (test pressure of approximately 1562.5 psig).

Licensee's Proposed Alternative Examination: The licensee reports that ASME Code Case N-479 will be invoked. The system hydrostatic test of the Class 2 boundary portion shall be performed in conjunction with the Class 1 system hydrostatic test to 1.1 times the operating pressure (test pressure of approximately 1122 psig), and shall meet the requirements of IWA-5000 and IWB-5000.

Licensee's Basis for Requesting Relief: The MSIV is not designed to withstand pressure in the reverse direction. The Class 2 boundary hydrostatic pressure would open the valve. This would necessitate the design and procurement of two plugs, one for each MSIV. The licensee states that each plug would have to retain 540,000 lbf without causing seat damage to the MSIV internals. This would also necessitate the complete disassembly and reassembly of the two MSIVs. The required time to disassemble the valves, install the plug, and reassemble the valves is 20 days. This does not include the 10 CFR Part 50 Appendix J Type C test that would be required after the evolution was complete. ASME Code Case N-479 has been previously approved by the NRC.

Staff Evaluation: The hydrostatic test is impractical to perform at the Code-required pressure because the design of the MSIVs will not withstand pressure in the reverse direction. As the licensee has stated, in order to perform the hydrostatic test at the Code-required pressure, the MSIVs would require disassembly and reassembly for installation of plugs. The increase in plant safety would not compensate for the burden placed on the licensee that would result from imposition of the requirement.

ASME Code Case N-479 permits the hydrostatic test pressure for the Class 2 portion of the subject piping to meet the requirements of IWA-5000 and IWB-5222. ASME Code Case N-479 was approved by the ASME Code Committee on July 24, 1989. Although the proposed alternative test pressure (Class 1 hydrostatic test pressure) is lower than the Code-required Class 2 hydrostatic test pressure, the alternative test pressure is greater than the operating pressure of the subject piping. Therefore, the proposed alternative test will provide assurance

of the continued inservice structural integrity. It is concluded that public health and safety will not be endangered by allowing the alternative test, as described in ASME Code Case N-479, to be performed in lieu of the Code requirement. Therefore, relief is granted as requested.

2.2 September 14, 1990 submittal, Attachment II: Hydrostatic Test of Class 2 Demineralized Water Transfer Piping Penetrating the Drywell Walls

Code Requirement: Section XI, Subarticle IWC-5222, System Hydrostatic Test, requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with design temperatures of 200°F or less, and at least 1.25 times the system pressure for systems with design temperatures above 200°F. The system pressure shall be the lowest pressure setting among the safety or relief valves provided for overpressure protection within the boundary of the system to be tested.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the Class 2 demineralized water transfer piping penetrating the drywell walls to 1.10 times the design pressure (test pressure of approximately 192.5 psig).

Licensee's Proposed Alternative Examination: The licensee states that preoperational testing for leak tight integrity will be performed per 10 CFR Part 50 Appendix J containment testing.

Licensee's Basis for Requesting Relief: The licensee states that the purpose of this line is to supply demineralized water to the drywell during refueling outages. During normal operations, the portion of this system penetrating the primary containment is disconnected and blind flanged both inside and outside containment. Therefore, although the demineralized water system is classified ASME Code Class 2 in 10 CFR 50.55a(g), it does not require pressure testing beyond that described in 10 CFR Part 50 Appendix J as it is not connected during normal operations.

Staff Evaluation: In order to assure that the structural integrity of the subject line is maintained, such that the system functions as designed, the Code-required hydrostatic test of this line should be performed. The licensee has not demonstrated that the Code-required hydrostatic test of the Class 2 demineralized water transfer line is impractical to perform or that compliance with the specific requirement would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, relief is denied.

2.3 January 11, 1991 submittal, Attachment III: Hydrostatic Testing of Class 2 Control Rod Drive and Scram Discharge Volume Systems from the 106 Valves to the Scram Discharge Volume

Code Requirement: Section XI, Subarticle IWC-5222, System Hydrostatic Test, requires that the system hydrostatic test pressure be at least 1.10 times the

system pressure for systems with design temperatures of 200°F or less, and at least 1.25 times the system pressure for systems with design temperatures above 200°F. The system pressure shall be the lowest pressure setting among the safety or relief valves provided for overpressure protection within the boundary of the system to be tested.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the Class 2 control rod drive and scram discharge volume systems from the 106 valves to the scram discharge volume at 1.25 times the design pressure (test pressure of approximately 2013 psig).

Licensee's Proposed Alternative Examination: The licensee will close the scram discharge volume drain valves and vent valves, insert and maintain a manual scram by opening the 126 and 127 valves to fill and pressurize the hydraulic control units and scram discharge volumes, and perform the Class 1 boundary pressure test (test pressure of approximately 1122 psig).

Licensee's Basis for Requesting Relief: The licensee reports that the design of the control rod drive mechanism allows leakage past the piston and collet housing. This leakage provides cooling water flow for the control rod drive mechanisms, but makes it nearly impossible to perform a Class 2 boundary hydrostatic test on the control rod drive piping external to the hydraulic control unit without overpressurizing the reactor pressure vessel.

Staff Evaluation: The design of the control rod drive mechanism does not permit pressurizing the subject piping to the Code-required test pressure without overpressurizing the reactor pressure vessel as there is leakage past the piston and collet housing. The only way the piping and the hydraulic control unit can be tested is to remove the control rod drive mechanisms and install a blank flange on each of the control rod drive housing flanges. The radiation exposure required to perform this task on all 137 control rod drive mechanisms is considered excessive.

The drawing attached to the request for relief shows that only about 4 feet per side, per drive, of the approximately 210 feet per side, per drive, of the control rod drive piping is internal to the hydraulic control unit and testable. Testing this piping would require 137 separate hydrostatic pressure tests and would result in less than 2% of the actual pipe run being pressurized.

The design of the control rod drive mechanism, therefore, makes the Code-required hydrostatic test impractical to perform. In order to perform the Code-required hydrostatic test, the control rod drive mechanisms would have to be redesigned, fabricated, and installed. The possible increase in plant safety would not compensate for the burden placed on the licensee that would result from imposition of the requirement.

GPUN has stated that the subject lines will be hydrostatically tested to the Class 1 test pressure during the Class 1 boundary hydrostatic test. Although the proposed alternative test pressure (Class 1 hydrostatic test pressure) is lower than the Code-required Class 2 hydrostatic test pressure, the alternative test pressure is greater than the operating pressure of the subject piping. The proposed alternative test will provide reasonable assurance of the continued

inservice structural integrity. It is concluded that public health and safety will not be endangered by allowing the alternative test to be performed in lieu of the Code requirement. Therefore, relief is granted as requested.

2.4 September 14, 1990 submittal, Attachment IV: Hydrostatic Testing of Class 2 Piping in the Core Spray, Containment Spray, and Cleanup Demineralizer Systems

Code Requirement: Section XI, Subarticle IWC-5222, System Hydrostatic Test, requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with design temperatures of 200°F or less, and at least 1.25 times the system pressure for systems with design temperatures above 200°F. The system pressure shall be the lowest pressure setting among the safety or relief valves provided for overpressure protection within the boundary of the system to be tested.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the Class 2 core spray, containment spray, and cleanup demineralizer systems between the torus and the first isolation valve other than a check valve to 1.25 times design pressure (test pressure of approximately 187.5 psig).

Licensee's Proposed Alternative Examination: The licensee will invoke paragraph IWC-5222(c). Open ended portions of a suction or drain line from a storage tank shall be considered as an extension of the tank up to the first shutoff valve from the tank.

Licensee's Basis for Requesting Relief: The torus is a storage tank designed for 35 psig. Leakage testing is performed in accordance with 10 CFR Part 50 Appendix J. A general inspection of the accessible interior and exterior surfaces of the containment structures and components is performed to verify leak tightness for the portions of the core spray and containment spray systems identified above.

Staff Evaluation: The design of the subject systems does not permit pressurizing the subject portions of Class 2 piping to the Code-required pressure without overpressurizing the torus. There are no test connections to isolate the subject portions of the core spray, containment spray, and cleanup demineralizer systems from the torus. The design of these systems, therefore, makes the Code-required hydrostatic test of the subject portions of piping impractical to perform. In order to perform the hydrostatic test in accordance with the Code requirement, these systems would require design modifications. The increase in plant safety would not compensate for the burden placed on the licensee that would result from imposition of the requirement.

The licensee has stated that the test requirements of IWC-5222(c) will be used in lieu of IWC-5222(a). Paragraph IWC-5222(c) states that, for the purpose of the test, open ended portions of a suction or drain line from a storage tank extending to the first shutoff valve shall be considered as an extension of the storage tank. This proposed alternative test will provide reasonable assurance

that the structural integrity of the subject portions of piping is maintained. It is concluded that public health and safety will not be endangered by allowing the alternative examination to be performed in lieu of the Code requirement. Therefore, relief is granted as requested.

2.5 September 14, 1990 submittal, Attachment V: Hydrostatic Testing of Class 3 Shell Side of the Isolation Condenser and Connected Piping

Code Requirement: Section XI, Subarticle IWD-5223(a), System Hydrostatic Test, requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with design temperatures of 200°F or less, and at least 1.25 times the system pressure for systems with design temperatures above 200°F. The system pressure shall be the lowest pressure setting among the safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the Class 3 shell side of the isolation condenser and connected piping to 1.25 times design pressure (test pressure of approximately 18.75 psig).

Licensee's Proposed Alternative Examination: The licensee will use IWD-5223(b) test requirements for Class 3 hydrostatic tests of atmospheric storage tanks. A pressure test will be performed with hydrostatic head pressure of its normal water volume (22,730 gallons), which corresponds to 7.2 feet, approximately one foot above the shell centerline. The 20-inch vent lines and the overflow lines shall be excluded as they are above the normal water level.

Licensee's Basis for Requesting Relief: The licensee states that both isolation condensers are continuously vented to atmosphere through 20-inch vent lines, which combine into a single 28-inch header on the "B" isolation condenser. There is no provision to isolate this system from the atmosphere and installing plugs in the vent lines would require erecting a work platform approximately 100 feet above the ground. As the specified Class 3 boundary test pressure is less than 20 psig, the expense and risk to personnel safety cannot be justified.

Staff Evaluation: The design of the isolation condensers is such that this system cannot be isolated from the atmosphere to perform the Code-required hydrostatic test without installing plugs in the 20-inch vent lines (100 feet above the ground) or making permanent design modifications to the vent lines. The system design, therefore, makes the Code-required hydrostatic test impractical to perform. The increase in plant safety would not compensate for the burden placed on the licensee that would result from imposition of the requirement.

The licensee has stated that the test requirements of IWD-5223(b) will be used for performing a hydrostatic test of the isolation condensers. However,

paragraph IWD-5223(b) states that the hydrostatic head, developed with the tank filled to its design capacity, shall be acceptable as the test pressure and the licensee states that a pressure test will be performed with the hydrostatic head pressure of its normal water volume. In order for the alternative test to be in accordance with the requirements of paragraph IWD-5223(b) the test must be performed with the hydrostatic head pressure developed with the tank filled to its design capacity. This alternative examination will provide assurance that structural integrity of the isolation condensers is maintained. It is concluded that public health and safety will not be endangered by allowing the hydrostatic test to be performed in accordance with paragraph IWD-5223(b) in lieu of paragraph IWD-5223(a). Therefore, relief is granted provided that the hydrostatic test is performed with the hydrostatic head pressure developed with the tank filled to its design capacity.

2.6 December 7, 1990 submittal, Attachment I: Examination Category B-P, Hydrostatic Testing of all Class 1 Pressure Retaining Components

Code Requirement: Section XI, Examination Category B-P, requires a system hydrostatic pressure test to be performed on all Class 1 pressure retaining components once each 10-year inspection interval per the requirements of Subarticle IWB-5222.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of all Class 1 pressure retaining components during the second 10-year interval.

Licensee's Proposed Alternative Examination: None. The Code-required system leakage test will be performed each outage and the test pressure will be held for a minimum of four hours prior to performing VT-2 visual examinations.

Licensee's Basis for Requesting Relief: The licensee states that many of the inservice related indications develop gradually and are detected by surveillance and inspection programs and that the Section XI hydrostatic pressure test offers very little increase in the confidence level for the integrity and reliability of systems already included in a regular surveillance and inspection program. In addition, the licensee reports that the requirements for performing the Code-required hydrostatic pressure test significantly burdens Oyster Creek with increased radiation exposure and dedication of manpower resources. Special valve line-ups, relief valve gagging, and bypass jumpers are needed in order to perform a higher than nominal operating pressure test.

The licensee states that this relief request is based on the technical justifications being used by ASME Section XI Subcommittee, Special Working Group for Pressure Tests, to develop a code case

Staff Evaluation: It is the NRC's position not to grant relief to a specific nuclear power plant from the ASME Code based upon a possible change to the Code. This change to the ASME Code, when written in its final form and approved by ASME, will be evaluated and approved or denied on a generic basis by the NRC. Therefore, this specific request for relief from the testing requirements of the ASME Code is denied.

2.7 December 7, 1990 submittal, Attachment II: Examination Category C-H, Hydrostatic Testing of all Class 2 Pressure Retaining Components

Code Requirement: Section XI, Examination Category C-H, requires a system hydrostatic pressure test to be performed on all Class 2 pressure retaining components once each 10-year inspection interval per the requirements of Subarticle IWC-5222.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of all Class 2 pressure retaining components during the second 10-year interval.

Licensee's Proposed Alternative Examination: The system leakage test will be performed every operating cycle on all Class 2 systems at nominal operating pressures. Prior to performing VT-2 visual examinations, the system will be at nominal operating pressure for a minimum of 4 hours for insulated systems and for at least 10 minutes for noninsulated systems

Licensee's Basis for Requesting Relief: The licensee states that many of the inservice related indications develop gradually and are detected by surveillance and inspection programs, and that the Section XI hydrostatic pressure test offers very little increase in the confidence level for the integrity and reliability of systems already included in a regular surveillance and inspection program. In addition, the licensee reports that the performance of the hydrostatic pressure test for Class 2 pressure retaining components has a significant impact of increased radiation exposure and manpower resources. The estimated craft expenditures, not including corrective maintenance, would be an additional 3 REM exposure and approximately 5,000 craftman hours. Because ASME Code requires these system hydrostatic tests to be scheduled together at or near the end of the inspection interval, the impact is heavily concentrated. Pump and valve packing require more corrective maintenance as the components are challenged by the test pressure exceeding the normal operating parameters. Building and removing staging platforms for valve work increases. Radwaste expenditures are increased when draining systems for valve work activities.

The licensee states that this relief request is based on the technical justifications being used by ASME Section XI Subcommittee, Special Working Group for Pressure Tests, to develop a code case.

Staff Evaluation: It is the NRC's position not to grant relief to a specific nuclear power plant from the ASME Code based upon a possible change to the Code. This change to the ASME Code, when written in its final form and approved by ASME, will be evaluated and approved or denied on a generic basis by the NRC. Therefore, this specific request for relief from the testing requirements of the ASME Code is denied.

3.0 CONCLUSION

Paragraph 10 CFR 50.55a(g)(4) requires that components (including supports) that are classified as ASME Code Class 1, 2, and 3 meet the requirements, except design and access provisions and preservice requirements, set forth in applicable editions of ASME Section XI to the extent practical within the limitations of design, geometry, and materials of construction of the components. Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee determined that

conformance with certain Code requirements is impractical for his facility and submitted supporting information in submittals dated September 14, 1990, December 7, 1990, and January 11, 1991. The staff has reviewed the licensee's submittals and has concluded that there are cases where relief can be granted as requested and cases in which the requested relief cannot be granted due to insufficient technical justifications. In the cases of the request for relief in Attachment II of the September 14, 1990 submittal and the requests for relief in Attachments I and II of the December 7, 1990 submittal, the licensee has not demonstrated that the Code requirement is impractical to perform; therefore, these requests for relief cannot be granted. Pursuant to 10 CFR 50.55a(g)(6)(i), the staff concludes that the requirements of the Code are impractical and relief may be granted for the issues described in the request for relief in Attachment III of the January 11, 1991 submittal, and the requests for relief in Attachments I, IV, and V of the September 14, 1990 submittal. Such relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. This relief has been granted giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Principal Contributor: G. Johnson

Date: March 26, 1991