U.S. NUCLEAR REGULATORY COMMISSION
REGION I

REPORT NO. 50-219/92-10

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LICENSE NO. DPR-16

LICENSEE: GPU Nuclear Corporation
P.O. Box 388
Forked River, New Jersey 08731

FACILITY NAME: Oyster Creek Nuclear Generating Station

INSPECTION AT: Forked River, New Jersey and Parsippany, New Jersey

INSPECTION DATES: April 29-30, 1992, May 4-8, 1992, May 26-29, 1992 at the site, and June 17-18, 1992 at the USNRC Region I Office

INSPECTOR: Harold I. Gregg — 6/24/92
Harold I. Gregg, Sr. Reactor Engineer, Systems Section, EB, DRS — Date

APPROVED BY: P. K. Eapen — 6/24/92
Dr. P. K. Eapen, Chief, Systems Section, Engineering Branch, DRS — Date

Areas Inspected: Design changes and modifications, on site and corporate engineering interface, design basis document reconstitution progress, licensee's initiatives, engineering organizational changes, and followup on pump and valve operational issues.

Inspection Results: Design modification information was well prepared and the design basis reconstitution program continues to be aggressive. The licensee's project re-engineering program is a strong commitment and a good initiative that will have a major impact on the engineering organization. Corporate engineering presence on site was noted. Two unresolved items were closed.

1.0 DESIGN MODIFICATIONS

The inspector reviewed the listing of 40 design modifications, dated April 29, 1992, to be accomplished in cycle 13 and outage 14R. The listing identifies the lead engineer and the planner for each design modification and the progress status of each item. It was noted that the engineering and design for almost all 40 modifications was performed in-house at corporate engineering. From discussions with corporate and site-based engineering personnel and from review of the progress status, the large in-house design effort was well planned and on schedule. The inspector selected the hardened vent system installation, deletion of containment spray automatic start logic, feedwater and recirculation flow control system upgrade, Appendix J test capabilities upgrade, and reactor recirculation pump vibration monitoring for review.

Hardened vent system installation (BA 402968) is being installed as a result of NRC GL 89-16, and provides a vent path to permit controlled depressurization of primary containment during severe accident scenarios. The vent path is via the torus using the drywell/torus isolation valves, the 8" N_2 purge lines, two new manually operated valves and over 200 feet of newly installed 10" piping to the main vent stack where the release is monitored by the existing radioactive gaseous effluent monitoring system.

Deletion of containment spray automatic start logic (BA 402894) is to eliminate operational and single failure concerns. This modification includes replacement of the present containment spray single selector switch with independent selector switches for each containment spray system, new drywell pressure instrumentation, and interlocks to prevent containment spray/emergency service water pump operation until diesel generator load sequencing (enhances load sequencing) is completed. This project also involves numerous operations and surveillance procedures.

Appendix J test capability improvement (BA 402946) is to provide compliance with 10 CFR 50, Appendix J requirements of single valve testing. The modification requires replacement of globe valves with ball valves, installation of spectacle flanges to enable improved testing, and the capability to test flange seals.

Reactor recirculation pump vibration monitoring permanent installation (BA 402821) is to enable remote monitoring of all 5 pumps during operation. This modification stemmed from the cycle 12 startup problems with the "D" pump. The new installation enables remote monitoring and capability to detect degradation during operation of these normally inaccessible pumps.

Each of the above modification packages were well prepared and clearly described the design details and included a comprehensive safety evaluation as required by 10 CFR 50.59. The project engineers have coordinated meetings with site engineering and operations to discuss each modification and to obtain feedback so that field changes would be minimized.

The hardened vent installation and the Appendix J test improvements, are to be accomplished as pilot modifications under the process re-engineering project recommended format. These modifications have assigned team members with defined responsibilities and a direct reporting chain to the technical functions director of Oyster Creek projects.

2.0 DESIGN BASIS DOCUMENT RECONSTITUTION

The licensee's design basis document (DBD) reconstitution program continues to be aggressive with the completion of automatic depressurization/mechanical, standby gas/secondary containment, and circulating water in 1991. At the time of this inspection, the licensee completed a total of 8 DBDs. The 1992 plans are to complete DBDs for core spray, main feed/condensate, radiation monitoring, containment program, and drywell cooling. The licensee's objective is to complete 4 to 5 DBDs per year from a total of 46 DBDs in the overall program plan.

As a result of DBD findings, implementation of several plant modifications are in process, including removal of containment spray single failure conditions. Upgrading of maintenance on circulating water pumps and improvements to operating procedures for the standby gas/secondary containment system were also accomplished due to DBD findings. Other benefits were the locating of additional design source documents, drawing and FSAR inconsistency corrections, and improved capability to respond to regulatory issues. The inspector verified that the licensee has a system to address DBD open items and the responsibility and scheduled date for resolution are assigned.

3.0 PROCESS RE-ENGINEERING PROGRAM

The licensee's commitment to improve performance through the use of a new re-engineering process was an excellent initiative. A Process Re-Engineering Project (PREP) team of 12 (increased to 16) reassigned full-time middle and senior managers was formed to develop new and better ways to perform work processes by improved methods and procedures that reflect needs, identifying personnel responsibilities early, and cultivating the need to change concept. Several PREP recommendations have already been made for implementation. One is the newly developed procedures that replace the overly complex procedure 108 for equipment control, valve alignment, tag out, and temporary modifications. Additionally, the following PREP recommendations are being implemented: the assignment of lead system engineering responsibility to corporate technical functions staff engineers who will be permanently based at the site and the team concept of an assigned operations and maintenance person to support the system engineer; the major commitment to perform the design development of all outage 14R modifications in-house, so that complete design knowledge will be maintained; and the project manager and team approach to be used in performing plant modifications. Two projects have been selected to test this concept during 14R.

4.0 VACUUM BREAKER VALVE STROKE PROBLEM

Followup of the vacuum breaker line butterfly valve V-26-18 stroking problem, initially described in NRC Inspection Report 50-219/91-31, was performed by the inspector.

Valve V-26-18 is a 20" Fisher, model 9120 wafer type butterfly valve with a Fisher size 40 model 481 double acting pneumatic piston actuator. There is no positioner and the valve service is full open or full closed. Air pressure under the piston opens the valve and air pressure over the piston closes the valve. The valve has a pre-molded elastomeric seat/body liner that is non-adhesively positioned in the valve body by front and back wrap around segments that become the gasketing for the mating flanges.

Valve V-26-18 and parallel valve V-26-16 are normally closed containment isolation valves (primary isolation of torus and are located in the reactor building). For accident conditions the valves have two functions, 1) to stay closed and prevent leakage as primary isolation of the torus, and 2) to open on a 0.5 psig Δp pressure signal to prevent torus failure due to negative torus pressure. Both open and close stroke tests are performed because of the dual safety function of the valves.

After repair of valve V-26-18 during the 13R outage, when a new seat liner was installed the valve opening stroke times increased and became inconsistent. The opening stroke was preceded by a 2-3 second hesitation prior to disc movement. An engineering evaluation justified the increased stroke time. Site engineering invoked stringent stroke time frequencies to obtain data on the effects of time between tests and stroke times.

Further engineering discussions with the valve vendor led to the May 30, 1992 replacement of the size 40 actuator on valve V-26-18 with a size 60 actuator that delivers almost twice the force. Stroke tests of the valve with the new actuator were scheduled with systematic increases of the time between tests. The schedule planned for several tests each at intervals of 2 days, 1 week, and 2 weeks, and then to the routine monthly schedule. The licensee's site engineering staff is monitoring each of the tests to ensure consistency of valve performance and to establish a valid baseline stroke time.

The stroke time results of May 30, 1992 through June 15, 1992, for the first 5 tests after the size 60 actuator installation were provided to the inspector during a phone conversation with the licensee's IST valve engineer on June 17, 1992. These stroke times were consistent and varied between 5.8 and 6.6 seconds on the open stroke and between 4.5 and 7.8 seconds on the close stroke. During a phone conversation with the inspector on June 18, 1992, the cognizant licensee engineer also verified that the prior stroke hesitation was eliminated. Based on the information obtained and the stroke testing verification that is being performed, the licensee's actions were considered appropriate to resolve this concern.

5.0 ENGINEERING SUPPORT OF 13-R OUTAGE

A review was made of engineering support of design modifications and of the overall performance of the full-time outage management control implemented for the first time during the 13-R outage. Engineering support was effective with the large group of corporate project engineers on site full-time to provide guidance for the modification installations. Outage performance improvement due to the full-time management assignments and the visibility and participation of corporate engineering management at the site was also noted. The unplanned repair of the leak at the bottom of the condensate storage task caused the outage to be extended, however, improvement in this overall outage performance was evident.

6.0 LICENSEE'S ACTIONS ON PREVIOUSLY IDENTIFIED NRC ITEMS

(Closed) Unresolved Item 50-219/91-03-02. The licensee's evaluation of core spray pump operation during a small break LOCA did not fully address the length of time the pumps can operate with minimum flow recirculation of 100 gpm.

The licensee addressed the concern of core spray pump operation with minimum flow of 100 gpm by obtaining additional information from the vendor and by imposing more stringent time restraint on pump operation under minimum flow conditions. The inspector verified that the licensee's emergency core cooling system operating procedure No. 308 was revised to increase minimum pump flow after two hours and to caution on the use of core spray pumps on minimum flow. The inspector further verified that the pump vendor, Ingersoll-Rand, provided information to demonstrate that the pumps could be operated up to 4 hours at minimum flow. The inspector considered the licensee's actions to be appropriate to resolve this concern.

This item is closed.

(Closed) Unresolved Item 50-219/91-03-01. The licensee's modification evaluations to replace the isolation condenser valves did not contain data on why the new valves would resist thermal binding or bonnet pressurization that were noted in safety evaluation SE-000211-011 for the old valves.

The licensee's letter of May 21, 1992, with attachments of safety evaluation SE-000211-011 and Technical Functions assigned action item request No. AT 6676 provided additional data regarding selection of the new valves. The prior valve history of thermal binding was the basic reason for selecting the double disc, parallel seat gate valves as replacements. The additional data also provided reasonable justification that bonnet pressurization was not the

cause of the prior problem. The licensee performed testing on the new valves and determined that the new valves can stroke open after cool down from a closure at maximum temperature of 400 to 500 degrees F. The inspector also verified that the vendor catalog information describes avoidance of thermal binding as a design feature of the new valves.

This item is closed.

7.0 TRAINING OF ENGINEERING PERSONNEL

The licensee has an INPO accredited training program for engineering support personnel (ESP). The program consists of an eight-part matrix of required classroom training modules that include system fundamentals, plant systems, licensing basis requirements, simulator training, and nuclear plant configuration control. The ESP training program is presently involved with the implementation of recent INPO guidance that defines needs for position-specific training dependent on the engineering job discipline and job function. (Example: project engineer, inservice inspection engineer, modification engineer). The licensee is presently developing qualification guides for the engineering disciplines. Their commitment for implementation is January 1, 1993. Specific tasks of this new training will include items such as, development of a request for project assignment, scheduling the project, developing a modification design package, and preparation of a safety evaluation.

8.0 EXIT MEETING

The inspector met with the licensee's representatives at the conclusion of the inspections on May 8, 1992 and on May 27 and 29, 1992, to summarize the findings of this inspection. Attendees at the exit meeting and persons contacted during the inspection are listed in Attachment 1.

ATTACHMENT 1

PERSONS CONTACTED

GPU Nuclear Generation Station

B. Behrle, Technical Function Site Director, Oyster Creek
G. Bond, Director, Systems Engineering
G. Busch, Licensing Manager
J. Colitz, Director, Project Engineering
F. Collado, Project Engineer
* P. Crosby, Acting Manager, Plant Engineering
J. Devine, Vice President Director, Technical Functions
* J. DeBlasio, Manager, Plant Engineering
* B. DeMerchant, Oyster Creek Licensing Engineer
B. Gan, Project Engineer
R. Keaton, Director, Continuous Improvement
* C. Lefler, Manager, Technical Functions, Oyster Creek Site
R. McGoey, Director, Electrical Engineering
E. Pagan, Licensing Engineer
P. Procacci, Project Engineer
D. Ranft, Director, Plant Engineering
A. Rone, Chairman PREP Program
J. Rogers, Licensing Engineer
D. Slear, Director, Technical Functions Engineering and Design
C. Tracy, Director, Engineering Projects, Oyster Creek
J. Wiley, Mechanical Engineer

U.S. Nuclear Regulatory Commission

* D. Vito, Senior Resident Inspector

* Denotes those present at the exit meeting of May 8, 1992.