

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-219/89-05

Docket No. 50-2

License No. DPR-16

Licensee: GPU Nuclear Corporation  
Oyster Creek Nuclear Generating Station  
Forked River, NJ 08731

Facility Name: Oyster Creek Nuclear Generating Station

Inspection At: Forked River and Missisippany, New Jersey

Inspection Dates: February 6-10 and 13-14, 1989

Inspector: *G. Napuda* 3/24/89  
G. Napuda, Senior Reactor Engineer date

Inspector: *W. Oliveira* 3/24/89  
W. Oliveira, Reactor Engineer date

Approved by: *N. Blumberg* 3/24/89  
N. Blumberg, Chief, Operational Programs date  
Section, Operations Branch, DRS,

Inspection Summary: Routine unannounced inspection on February 6-10 and 13-14, 1989 (Report No. 50-247/89-05)

Areas Inspected: Review of the licensee implementation of their Drawing Control Program including configuration control, currency and accuracy of those drawings needed for plant operations and verification of as-installed conditions. The inspection included observation of work activities, and QA/QC interface with the Drawing Control Program.

Results: Several aspects of the licensee's Drawing Control Program had been previously identified as inadequate by the licensee's own staff and extensive upgrading of the program is planned because of the self identified deficiencies. The inspectors noted that a special project for extensive corrective actions had recently received approval and that some corrective actions were ongoing. One unresolved item was identified with respect to the adequacy and timely completion of ongoing corrective actions because previous NRC inspections had identified drawing control problems and, because many self identified deficiencies have not yet been corrected (see paragraph 2.4).

## DETAILS

### 1. Persons Contacted

- \*R. Barrett, Director, Plant Operations
- \*J. Barton, Deputy Director, OCNGS
- \*J. Christain, Lead Quality Assurance (QA) Auditor
- \*C. Crowe, Engineer, Technical Support, Maintenance & Construction Facility (MCF)
- \*B. DeMarchant, Licensing Engineer
- \*R. Fenti, Manager, QA Modifications/Operations
- \*E. Fitzpatrick, Vice President and Director, OCNGS
- \*V. Foglia, Manager, Technical Functions
- \*R. Kind, Design Coordinator, Technical Functions
- R. Markowski, Manager QA Audits
- M. Radvansky, Manager, Design and Drafting
- \*D. Ranft, Manager, Plant Engineering
- D. Shivas, Engineering Drafting Manager
- \*J. Solakiewicz, Supervisor, QA
- E. Wallace, Manager Technical Functions
- \*E. Wright, Supervisor, Design and Drafting

#### United States Nuclear Regulatory Commission

- J. Wechselberger, Senior Resident Inspector
- \*E. Collins, Resident Inspector

\* Denotes those who attended the exit meeting on October 2, 1987

### 2. Drawing Control Program (35742)

#### 2.1 Scope

The effectiveness of the implementation of the licensee's drawing control program was assessed by reviewing activities in engineering (modifications, drafting), operations, maintenance (mechanical, electrical, and instrument and control), and quality assurance/control (QA/QC) areas.

The inspectors performed the following to assess the adequacy of the drawing control program and effectiveness of its implementation.

- Reviewed the implementing procedures such as the Station Administrative and Operating Procedures listed in Attachment A.
- Observed selected tasks being performed that required the use of engineering drawings and or vendor manual drawings.
- Interviewed the drawing user personnel, their supervision, QA and QC, and the technical support staff (e.g. Technical Functions).

- Determined whether the drawings in use were the most recent revision as listed in the computer assisted records and information retrieval system (CARIRS).
- Verified that the as-installed/as-built conditions depicted by the drawings was correct.
- Verified that engineering change notices were captured by the CARIRS data base.
- Determined whether CARIRS contained the latest information on the status of drawings and changes thereto.
- Verified that appropriate as-installed information was provided to the Control Room in an adequate and timely fashion.

## 2.2 Findings

### 2.2.1 Program Review

Oyster Creek (OC) procedure no. 107.1 establishes the method for providing up-to-date drawings and the controls for these drawings to assure that technical information is accurate, available and current. Drawings are assigned to categories (R1 through R4) based on whether they are needed by Control Room personnel to operate the plant (R1) or are of lesser importance. Drawings used by staff who support plant operation are classified R2 and less important drawings R3 or R4. The R1 category drawings must be updated within 30 days of being affected by a change document and the R2 category drawings must be updated when affected by more than six interim change documents. Only drawings with an As-Built, As-Designed, approved As-Installed or Operation status are specified to be used for operations or maintenance activities. Effective as of this outage the R1 category drawings in the Control Room, affected by a change document, must have as-installed marked-up attachments prior to the use of a system for any reason (e.g. testing, tagout).

A drawing's status is determined by accessing the Computer Assisted Records and Information Retrieval System. CARIRS contains the Configuration Control System which generates the hard copy of the Drawing Index. Distribution of the drawings and index lists is the responsibility of the Engineering Data and Configuration Control (ED&CC) Section in the Technical Functions Division. ED&CC is also responsible for user access training for CARIRS.

Oyster Creek (OC) procedure 124.3 was developed and issued to describe the new turnover process for integrated job packages for 12R outage work and the interim use of marked-up construction drawings by Control Room personnel.

The above procedures were being implemented by contractor as well as licensee personnel and user copies were controlled and current.

### 2.2.2 Control Room Drawings

The Control Room List is an index of drawings issued by the Information Management Center (IMC) and is used by the Operations Control Manager (OCM) to develop the Controlled Blueprint List for the Control Room. The major difference between the two lists is that the the Controlled Blueprint List has specific file numbers for the controlled drawings/diagrams. The Controlled Blueprint List is to be issued monthly and any changes thereto is approved by the OCM.

A Control Room Operator was observed using controlled drawing BR 2013, sheets 1-5 while approving the tag out of the air system valves V-6-484 and 485. It was noted that (1) there were two number four (4) sheets for the drawing; (2) one sheet was a revision 26 dated January 17, 1989 and listed in CARIRS as the latest revision without any changes pending; and (3) the second sheet was a marked-up revision 25 dated November 29, 1988 with a notation that Field Change Notice (FCN) COS0219 affected this revision. Licensee staff investigated this apparent inconsistency and determined that FCN COS0219 still affected revision 26 and updated the the information in CARIRs and the Control Room files. It was later identified that drawings BR 2005 and 3004 had the same deficiencies as drawing BR 2013. The deficiencies were brought to the attention of licensee staff who initiated action to correct this deficiency prior to the conclusion of the inspection. An in depth review in conjunction with licensee staff as to the root cause of these deficiencies and their significance identified that (1) newly implemented procedure 124.3 needed to be revised to prevent such recurrence and (2) these deficiencies would have been corrected in the formal turnover process of modified systems prior to plant startup. Licensee staff were in the process of determining needed changes to the procedure prior to the conclusion of this inspection.

Two other minor deficiencies were identified and brought to the licensee's attention who completed corrective actions prior to the conclusion of this inspection. The first was that the Controlled Blueprint List used for reference by Control Room Operators was not current. The second was that numbered files in the Control Room contained drawings of more than one system which was contrary to instructions in procedure 107.1. An example was drawing file number 9, designated for Service Air Flow Diagram M612, that was found to also contain drawings M615, Flow Diagram for Condensate Demineralizer Water; M725, Flow Diagram for the Radwaste Concentrator A; and, M726, Concentrator B. It was determined that neither deficiency constituted a safety concern.

### 2.2.3 Vendor Manual Drawings

The inspectors observed the following activities where vendor manual (VM) drawings were used to perform assigned tasks.

- Work Request (WR) 049143, range resistance tests to the hydrogen/oxygen analyzer.
- WR 053150, Core Spray Booster Pump (FCN C057784).
- WR 041222, "B" Shut down cooling pump motor bearings.
- Job Order 15261, repairs to CRD Hydraulic Control Units (HCU) V-126 and 127.
- WR 042794, Emergency Condenser "A" Condensate Return Valve V-14-34 work.

The workers correctly determined the status of the drawings used and obtained updated information as necessary. It was noted that all the VM drawings were annotated that the drawings were not to be considered the latest revision until verified through CARIRS. Personnel performing the tasks were familiar with CARIRS and considered it to be an accurate and reliable information source.

The inspector also selected a sample of VMs in the maintenance files and compared their revision status with the VM Control Center. The VMs were the current revisions and had been properly filed.

### 2.2.4 Change Documents

Drawings are revised when necessary to depict completed modifications, correct errors, etc. Revisions to drawings are accomplished and controlled by a number of documents with acronyms such as DCN, DRF, FCR and FQ. A listing of such changes had been maintained by various engineering groups and is currently compiled into a single computerized Engineering Data Base listing under the control of the Technical Functions Department.

Sixteen change documents that affected the core spray, emergency service water, service water and 4160v systems were selected from the Engineering Data Base. One or more of the following were determined and or verified for each change document and the drawing(s) affected to assess the effectiveness of drawing controls.

- CARIRS listed the document as outstanding on the given drawing.
- Subsequent drawing revisions indicated the change document was incorporated.

- The as-installed conditions depicted on the change document were accurately transcribed onto the revised drawing.
- Four as-built conditions were accurately depicted on the change documents and or revised drawing(s).
- Multiple drawings (a sample) depicting the same change were consistent with each other.
- Control Room drawings that were affected by outstanding change documents had accurate marked-up attachments.
- Drawings required to be revised within 30 days were being redrawn by the onsite drafting group.
- Selected components that had been added to a system were incorporated into appropriate lists (e.g. valve lists, GMS 2).

Deficiencies identified were: (1) drawings so congested that the applicable microfilm (i.e. aperture card) was not useable and a full size copy difficult to read; (2) drawing originals (i.e. sepias) dark and yellowed with age so that reproductions were barely legible; (3) certain types of drawings depicting the same system not cross referencing each other (e.g. Control Room BRxxxx series vs. GExxxxxxxx series); and, (4) a time lapse between the attaching of a mark-up to a Control Room drawing and the listing of the change document identifier in CARIRS. The first three deficiencies had been identified previously by the licensee as discussed in paragraphs 2.2.5 and 2.3 of this report and corrective actions were ongoing. The fourth deficiency was corrected immediately and was attributable to a "bug" in recently implemented station procedure 124.3, revision 0. No safety concern existed since the formal turnover process for modifications would assure that CARIRS was updated and all turnovers must be closed prior to plant startup. The licensee's staff was in the process of determining how to improve procedure 124.3 prior to the conclusion of this inspection.

#### 2.2.5 Licensee Corrective Actions

Deficiencies and problems with the Drawing Control Program had been previously identified by licensee QA/QC and other staff. On a number of occasions the NRC has also identified specific unacceptable conditions (see Attachment 1, Item 6). The licensee initiated a broadbased effort with respect to the program in early 1988 that resulted in corrective actions that included senior management approval of a project in November, 1988 to upgrade drawing controls.

The first phase of the effort was a survey that addressed the reason and frequency of drawing use; the form (film, full size, etc.) of drawing used; access (determination of drawing required, convenience of location and timeliness of revisions); drawing content and accuracy; drawing format; and, user personnel comments.

The key survey results were that drawings were most often used for maintenance work, modifications, and operations activities; the control room drawings were being revised in a timely manner; drawing legibility was a principal concern; and inefficiencies were experienced in the research of drawing change documents.

Recommendations forwarded to senior management were to proceed with a drawing legibility project; incorporate outstanding change documents on key R2 category drawings and change their category to R1; decide on whether to enhance drawing titles and cross referencing; provide instructional seminars to drawing users (drawing system organization, history, limitations, change process, etc.); and, provide feedback to the organization on survey results.

The Configuration Management-Drawing Program Project that was approved by senior management in late 1988 will include the following activities.

- Improve legibility/useability of drawings.
- Implement CARIRS/EDB tag number (i.e. equipment identifier) interface.
- Install a user-friendly "front end" software enhancement for CARIRS.
- Redraw approximately 1000 P&ID, elementary, single line diagram, panel schedules, etc. drawings by Computer Assisted Design and Drafting (CADD) methodology.

Project emphasis is to complete upgrading drawings early in the effort (i.e. 89-90 timeframe) in order to assure that suitable drawings are available for the licensee design basis reconstitution program.

### 2.3 QA/QC Interface With Oyster Creek Nuclear Generating Station

An Operations Quality Assurance (OQA) monitoring report (0025021) addressed deficiencies in drawing controls. The OQA report noted poor quality of micro aperture cards, CARIRS not being user friendly, and that drawing control deficiencies were symptoms of a system/program problem. During the conduct of Audit S-OC-88-03, OQA identified that revisions to R2 drawings with more than six outstanding changes were not being accomplished as required. As a

result of these and other deficiencies identified by OQA, Quality Deficiency Report (QDR) 88-014 was issued to appropriate functional managers. Additionally, OQA memorandum S-OC-88.03.01 2.3 dated August 17, 1988 escalated an audit finding regarding Control Room drawings not being revised within 30 days to higher management for appropriate action. It was verified that corrective action had been completed with respect to the revision of Control Room drawings within 30 days. It was noted that the deficiencies identified by the inspectors and brought to licensee attention as discussed in previous paragraphs (e.g. Control Room As Built drawings) were addressed in the QDR. On January 27, 1989, the Manager of Design and Drafting sent a memorandum to the OCM identifying the corrective action that will be taken to resolve drawing concerns.

The inspectors were concerned with the extent of the problems in drawing control (e.g. legibility) identified by licensee QA/QC and other staff and confirmed by the inspectors; drawing control problems identified during other NRC inspections (see Attachment 1); and, the magnitude of the licensee project needed to correct and enhance drawing controls. Therefore, the adequacy and timeliness of licensee project actions to correct and improve the drawing control program, including additional training for users of CARIRS, will be an unresolved item pending completion of licensee action and further NRC review (50-219/89-05-01).

#### 2.4 Conclusions

The drawing control program is well documented. The overview of program implementation by QA/QC and other staff has resulted in the self identification of significant problems, many of which were confirmed during this inspection. Instances of unacceptable implementation have also been identified during recent NRC inspections (see Attachment 1).

The extent of problems in this area warrants continued licensee management attention and expenditure of resources for adequate and timely corrective actions. The magnitude of the corrective action project and need for continued management support for adequate and timely completion warrants further review by the NRC and is the reason for Unresolved Item 50-219/89-05-01 discussed in paragraph 2.3.

#### 3.0 Unresolved Items

Unresolved items are matter about which more information is required to ascertain whether they are acceptable items or violation. One unresolved item is identified and is discussed in paragraph 2.3.



#### 4.0 Management Meetings

Licensee management was informed of the scope and purpose of the inspection on February 6, 1989. The findings of the inspection were discussed with the licensee representatives during the course of the inspection and presented to licensee management at the February 14, 1989 exit interview (see paragraph 1 for attendees).

At no time during the inspection was written material provided to the licensee by the inspector. The licensee indicated that no proprietary information was involved within the scope of this inspection.

## ATTACHMENT I

### Documents Reviewed

#### 1.0. Requirements and Procedures

10 CFR 50 Appendix B, Criterion V and VI

ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

Operational Quality Assurance Plan

Oyster Creek (OC) Procedure 107.1, Drawing Control Procedure, Rev 5.

Corporate Administrative Procedure 1000,-ADM-1211.02 (EMP-016), Plant Configuration Control List, Rev 5.

OC Procedure 124.3, Work Control and Record Closeout Process for Specific 12R Outage Work, Rev 0

#### 2.0 Drawings

M612, Service Air, Rev 17

M615, Condensate Demineralizer Water, Rev 10

M725, Radwaste Concentrator A, Rev 5

M726, Radwaste Concentrator B, Rev 3

BR 2013, Instrument, Service, Breathing and Bleeder Check Trip Air System, Revs. 25 and 26

Vendor Manual (VM) drawing 010531, Hydrogen and Oxygen Analyzer Pot Calibration, Rev 4

VM 116B8328, Core Spray Booster Pump, Rev 11

VM NEO1-A & B, Condensate Return Valves, Rev 7

#### 3.0 Drawing Lists

Control Room List

Controlled Blueprint List for the Control Room

Oyster Creek Drawing Index

#### 4.0 Quality Assurance (QA) Reports

Monitoring Report (MR) 88525021, Drawing Control Program

MR 8824004A, Followup of Department Procedures Posted in CARIRS

MR 8821002, In Progress Job Package Review-Equipment

MR 8821008, Observance of Maintenance Work

MR 8821013, Job Order Packages-Work in Progress

MR 8821014, Safety System Outage Modification Inspection

MR 8821015, Torus and Drywell Vacuum Breaker Inspection

Quality Deficiency Report (QDR) 88-014, Control Room As Built Drawings

QDR 88-022, Negative Trend on Using Non-controlled Drawings, Documents, etc.

Memorandum S-OC-88.03.01 2.3 (August 17,1988), Escalation of an Audit Finding, regarding Control Room Drawings.

5.0 Work Requests (WR) and Job Orders (JO)

WR 041222, Repair of "B" Shut Down Cooling Pump Motor Bearings

WR 042794, Repair of Emergency Condenser "A" Return Valve V-14-34

WR 049143, Conduct Range Resistance Tests to the H2/O2 Analyzer

WR 053150, Repairs to the Core Spray Booster Pump

JO 15261, Repairs To CRD Hydraulic Control Units (HCU) V-126 and 127

6.0 Previous NRC Inspections

Report No. 50-219/88-23, inspection conducted 7/31-9/10/88

Report No. 50-219/88-25, inspection conducted 8/29-9/2/88

Report No. 50-219/88-38, inspection conducted 12/4/88-1/4/89