

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-412/85-08

Docket No. 50-412

License No. CPPR-105 Priority - Category B

Licensee: Duquesne Light Company
Robinson Plaza Building No. 2
Suite 210, PA Route 60
Pittsburgh, PA 15205

Facility Name: Beaver Valley Power Station - Unit No. 2

Inspection At: Shippingport, Pennsylvania

Inspection Conducted: April 14-19, 1985

Inspector: H. F. Van Kessel
H. F. Van Kessel, Reactor Engineer

6/13/85
Date

Approved by: L. H. Bettenhausen for
L. H. Bettenhausen, Chief,
Operations Branch, DRS

6/14/85
Date

Inspection Summary: Inspection on April 14-19, 1985 (Inspection Report No. 50-412/85-08)

Areas Inspected: Routine, unannounced inspection of the pre-operational test program including test program requirements and implementation, test procedure reviews, reactor coolant system hydrostatic test, licensee action on previous inspection findings, quality assurance and quality control for the test program, and tours of the facility. The inspection involved 36 hours on site by one NRC Region based inspector.

Results: No violations were identified.

DETAILS

1.0 Persons Contacted

Duquesne Light Company (DLC)

- * F.A. Arnold, Staff Engineer, Startup Group (SUG)
- * C.R. Davis, Director QA
- * D.W. Denning, Assistant Director QA
- R. Flodstrom, Assistant Director QC System Release and Startup
- * D.C. Hunkele, Director QA, Operations
- * T.P. Noonan, Beaver Valley 2, Station Superintendent
- * M. Pavlick, Director Milestone Management
- * R.J. Swiderski, Startup Manager
- * D.H. Williams, Startup Engineer
- * R.G. Williams, Supervisor Testing and Plant Performance

U.S. Nuclear Regulatory Commission

- * D.M. Johnson, Resident Inspector, Beaver Valley 1
- * L.J. Privity, Resident Inspector, Beaver Valley 2
- W. Troskoski, Senior Resident Inspector, Beaver Valley 1
- * G.A. Walton, Senior Resident Inspector, Beaver Valley 2

* Denotes those present at exit interview on April 19, 1985.

2.0 Licensee Action on Previous Inspection Findings

2.1 (Closed) Unresolved Item (412/85-01-01). Start-up Manual not available for review by NRC. The Start-up Manual (SUM) has been completed and was available for review. It was approved in accordance with requirements. For further details on the review of the SUM see Section 3.1. This unresolved item is closed.

2.2 (Closed) Unresolved Item (412/85-01-02). Procedure for inverter testing not available for review by NRC. The procedure for inverter testing has been reunited with the procedure for battery testing and is now available for review by the NRC without the many corrections shown previously. This unresolved item is closed.

3.0 Preoperational Test Program

3.1 References

- (1) Beaver Valley 2 FSAR, Chapter 14, "Initial Test Program".
- (2) Beaver Valley 2 FSAR, Chapter 17, "Quality Assurance".
- (3) Beaver Valley 2, "Start-up Manual (SUM)", Effective date, March 29, 1985.

- (4) ANSI N45.2.6-1978, "Qualifications of Inspection, Examination and Testing Personnel for Nuclear Power Plants".
- (5) Field Construction Procedure FCP-30, Change 0, "Conduct of Phase-1 Test Program", issued by Stone and Webster Engineering Corporation (SWEC).
- (6) "Quality Assurance Program Manual", Beaver Valley Power Station.
- (7) Regulatory Guide 1.58, Rev. 1, "Qualification of Nuclear Power Plant Inspection, Examination and Testing Personnel", September 1980.
- (8) Regulatory Guide 1.68, "Initial Test Programs for Water Cooled Nuclear Power Plants".
- (9) ANSI N18.7-1976 (Revision of N18.7-1972), "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants".
- (10) ANSI N45.2 - 1971, "Quality Assurance Program Requirements for Nuclear Power Plants".
- (11) 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants".
- (12) Field Construction Procedure FCP-51, Change No. 3, "System/Sub-System Turnover to DLC-CSUG", SWEC, July 30, 1984.
- (13) Field Construction Procedure FCP-29, Change No. 8, "Exception Work Tracking", SWEC, August 6, 1984.

3.2 Test Program Requirements

The NRC Inspector met with key personnel of the Start-up Group (SUG) to discuss various aspects of the Unit 2 preoperational test program.

Areas addressed included the definition of the test program, the test organization and test program administration.

Discussion

Since the Start-up Manual (SUM) was available during this inspection for NRC review (see paragraph 2.1 above) it was reviewed, partly, for the implementation of regulatory requirements in the Unit 2 preoperational test program. The preoperational test program for Beaver Valley 2 is described in chapter 14 of the FSAR. The SUM is composed

of independent procedures which identify and control how the testing is to be conducted. A chapter has been added to identify who controls the testing (test organization) but the manual does not describe what the test program. The inspector observed that the program description or a reference thereto, is highly desirable to make a manual out of the assembly of independent procedures.

The inspector verified, through discussions with key test personnel and review of the SUM, that the following areas of testing are covered in the SUM:

- (1) Flushing and cleaning of systems
- (2) Hydrostatic tests
- (3) Instrument Calibration
- (4) System Turnover
- (5) Functional Equipment Demonstration
- (6) EE/ME/I&C testing

The inspector verified that the test program meets FSAR commitments in the following areas:

- (1) Tests are identified and sequenced
- (2) Test procedure contains test objectives, prerequisites, test summary, and acceptance criteria.

The individual tests to be performed under the preoperational test program are not identified in the SUM. They are listed in a separate index which is not a part of the SUM. The inspector noted during inspection 50-412/85-01, and also during this inspection, that a perfect match between the preoperational tests, as listed by the Licensee, and the regulatory requirements was not achieved. In addition there are some test classification problems which require correction. For instance, the Steam Generator Hydrostatic Test (secondary side) and the Reactor Vessel Internals Vibration Test are not listed as preoperational tests. Initial Core Loading, however, is listed as a preoperational test. The inspector verified that format and content requirements of the test procedures met regulatory requirements (SUM 3.5.1).

Review of the SUM sections addressed showed that formal methods have been established for the test organization to receive jurisdiction from construction of systems, components, and instrumentation prior to testing. The methods are described under Section 7.1 of the SUM in the form of turnover procedures. Control of system status prior to testing is achieved through tagging procedures as provided under Section 7.2.5 of the SUM. The inspector observed that there was no check off list, with sign off requirements, for the placement of jurisdictional tags. For "danger tags", however, there is a check off list with sign-off requirements. The inspector will pursue this item in future inspections.

Return of systems and components to construction for modification or repair is controlled by procedures defined under Section 7.2 of the SUM. The control of system status subsequent to testing is controlled by procedures defined under Section 3.5 of the SUM. Section 3.4 (paragraph 14) of the SUM deals with temporary installations of piping (bypasses) and other items.

The inspector observed the absence of a separate system restoration section in several procedures reviewed during this inspection as well as during inspection 50-412/85-01. The licensee explained that they prefer to restore the system immediately after the need for a given system status item expires during the test. In some cases such restoration may not take place until the end of the test but, in many cases, it is possible to do it before the end of the test. Where restoration steps occur in the procedure, there is a sign off requirement for each step. The inspector concurred with this method of system restoration but will check on this item in future reviews of test procedures.

Formal administrative measures have been established to govern the conduct of testing including: the use of current test procedures (SUM 3.5.3), test personnel's knowledge of the test procedure (SUM 3.5.3), changes to test procedures during testing (SUM 3.5.1), criteria for test interruption and continuation (SUM 3.5.3), test coordination (SUM 3.5.2), documenting significant events, unusual conditions, or interruptions experienced during testing (SUM 2.6 under "Conduct of Critique") and identification of test deficiencies (SUM 3.5.3).

Scheduling and sequencing of test activities is being accomplished via a CPM network. Milestones for the start-up schedule have been established (see Section 3.4). Test results evaluation is controlled by procedures defined in Section 3.5.3 of the SUM including data reduction requirements (Paragraph VI B.14), acceptance criteria (Paragraph VI B.14.b), identification of test deficiencies (Paragraph VI B.8.b(1)&(2)), retest requirements defined (Paragraph VI B.12), and review and approval requirements.

The inspector verified that the required qualifications of key personnel in the test program are included in the SUM (Section 6.2.1). The inspector, also, reviewed the training and qualification records of key test personnel. Except for one record, the records were incomplete and did not contain the required qualification certificates and experience background information. Through discussions with the same test personnel, the inspector ascertained that their experience and educational background should be adequate to qualify them for the assigned positions in accordance with ANSI N18.7 and N45.2.6. It will be necessary, however, to update the records to positively verify the qualifications of these key test personnel. The inspector will follow up on this item in a future inspection(s).

The inspector verified that: responsibilities of key test personnel were specified (SUM Section 1); the responsibility for appointing key test personnel was defined (SUM 1, Paragraph IV.B.1); the authority and responsibilities of test personnel were defined (SUM Section 1); the interfaces between organizations involved in the test program were established (Chapter 17 of FSAR for QA/QC interface; SUM Chapter 7 for Contractors; Chapter 1 of SUM for organizations SWEC, Westinghouse, Duquesne Light Company).

Findings

- (1) Program tests were not, in all cases, found to be classified in accordance with regulatory requirements. For example, the Steam Generator Hydrostatic Test (secondary side) and the Reactor Vessel Internals Vibration Test were not listed as preoperational tests. The inspector will follow the Licensee's corrective efforts under Unresolved Item 412/85-08-01.
- (2) Five qualification and training records of key test personnel were found to be incomplete by the inspector. The required qualification certificates and supporting experience and educational background information was absent from these records. While it is apparent from discussions with these key test personnel that they should qualify for the assigned supervisory positions, it will be necessary to completely update these records to verify that their qualifications are in accordance with ANSI N18.7 and N45.2.6. The inspector will follow the Licensee's corrective efforts under Unresolved Item 412/85-08-02.
- (3) The absence of records for the placement of jurisdictional tags after system turnover represents a potential lack of control over pre-test conditions. The inspector will follow up on this Unresolved Item 412/85-08-03 in a future inspection.

- (4) The Startup Manual does not use or reference the existing pre-operational test program description in Chapter 14 of the FSAR. This causes the manual to be without a scope of work description. The inspector will follow up on this Unresolved Item 412/85-08-04 in a future inspectors.

3.3 Test Procedure Review and Verification

The approved Preoperational Test (PO) and System Operability Verification (SOV) test procedures listed in Attachment A were reviewed for administrative and technical adequacy and for verification that adequate testing is planned to satisfy regulatory guidance and licensee commitments.

The procedures were examined for management review and approval, procedure format, clearly stated test objectives, prerequisites, environmental conditions, acceptance criteria, source of acceptance criteria, references, initial conditions, achievement of test objectives, performance documentation and verification, detailed instructions for performance of test, restoration of system to normal conditions after testing, identification of personnel conducting the test, evaluation of test data, independent verification of critical steps or parameters, quality assurance and quality control interface and involvement.

Discussion

The following test procedures, as listed in Attachment A of this report, were reviewed:

POs: 2.06.10; 2.06.13; 2.21A.02; 2.47.02; 2.47.03; 2.47.04.

SOVs: 2.41D.01; 2.34.02.

PO 2.47.02 was found not to have a system restoration section, while PO 2.47.03 and 04 had a very general system restoration remark at the end of the procedure. These, and similar observations made by the inspector during inspection 50-412/85-01 were discussed with SUG management.

Findings

No violations were identified by the inspector.

3.4 Test Program Status and Schedule

New milestones have been determined for the test program as follows:

	<u>New</u>	<u>Old</u>
• Steam Generator Hydro. (secondary side)	11/85	5/85
• RCS "Cold Hydro"	3/86	7/85
• Hot Functional Test	10/86	2/86
• CILRT and SIT	2/87	5/86
• Fuel Loading	4/87	6/86

Compared with the milestone dates received during the previous inspection (50-412/85-01), the program has been delayed by 8 months. With the additional 8 months, the Licensee will be in a good position to satisfy their commitment to Regulatory Guide 1.68, i.e., to supply approved test procedures for NRC review 60 days prior to performance of the corresponding test.

Of the 79 PO and 81 SOV test procedures required, 58 POs and 68 SOVs have been written in draft form, 14 POs and 12 SOVs have been approved for testing. Zero pre-operational tests have been completed. Of the 450 (64 complete systems) subsystems, 162 have been turned over to SUG by construction.

A newly revised 90 day plan, for the 2nd quarter of 1985, was received by the inspector as well as a (Level 2) CPM activity network which is based on the new milestone schedule.

4.0 Quality Assurance (QA) and Quality Control (QC) for the Preoperational

Test Program

The inspector met with key personnel of the QA and QC organizations, to determine their involvement with the program. Particular attention was paid to the areas of surveillance plans, test witnessing, hold point assignments, turn-back of systems after turnover, and the coordination of turnover packages.

Discussion

A new Director for QA Operations has been appointed. He reports to the QA - Unit Manager in parallel with the Director of Site Quality Control. He is responsible for the quality assurance aspects of the preoperational test program. He informed the inspector that his group will do surveillances only. A surveillance plan, however, has not been developed to date. The inspector will closely follow the Licensee's action in this regard.

The involvement of Site Quality Control (SQC) with the test program was discussed with the Assistant Director "QC System Release and Startup". He informed the inspector that SQC will do surveillances on maintenance of the equipment. A surveillance plan exists. Prior to turnover of the system, SQC will coordinate the turnover packages. SQC also will provide QC coverage for post turnover deficiencies and test deficiencies for which a Start-up Work Request (SWR) will be generated. The SWR form has a sign off requirement on inspection requirements. If hold points are required they must be identified on the form. The surveillance, performed by SQC, include the calibration of test equipment. There are weekly meetings between SQC and SWEC to track progress on priority items of the exception work tracking list.

Findings

No violations or deviations were identified.

5.0 Plant Tours

The inspectors made tours of the facility including the Control Room, the Auxiliary Building, the Fuel Building, the Reactor Building, and the Emergency Diesel Generator Building. Specific attention was paid to the status of construction, housekeeping, fire protection, ongoing system modifications, and jurisdictional and safety tagging of systems. During these tours, the inspector had discussions with start-up personnel on such items as construction status, system turnovers, integrated project schedules, and test sequencing.

No discrepancies were noted in these areas.

6.0 Unresolved Items

Unresolved items are matters about which more information is required to ascertain whether they are acceptable items, items of non compliance or deviations. Unresolved items, resulting from this inspection, are discussed in Sections 3 and 4 above (four items).

7.0 Exit Interview

At the conclusion of the site inspection, on April 19, 1985, an exit meeting was conducted with the licensee's senior site representatives (denoted in paragraph 1). The findings were identified and previous inspection items were discussed.

At no time during this inspection was written material provided to the licensee by the inspector.

ATTACHMENT A

PROCEDURE REVIEWS

- (1) PO-2.158.01 Revision 0, Approved April 30, 1984
Neutron Shield Tank Cooling Test
- (2) PO-2.1303 Revision 0, Approved August 24, 1984
Quench and Recirculation Spray Nozzle Air Flow Test
- (3) PO-2.13.02 Revision 0, Approved August 21, 1984
Quench Spray System Pumps and Controls Test
- (4) PO-2.13.04 Revision 0, Approved December 18, 1984
Refueling Water Storage Tank Test
- (5) PO-2.47.05 Revision 0, Approved November 29, 1984
Containment Type B Leak Rate Test for Fuel Transfer Tube Flange
- (6) PO-2.06-04 Revision 0, Approved November 14, 1984
Reactor Coolant Loop Isolation Valves Initial Checkout
- (7) PO-2.39.01 Revision 1, Approved September 26, 1984
2-1 and 2-2 Batteries, Inverters, and Chargers Test
- (8) PO-2.39.03 Revision 0, Approved September 20, 1984
2-3 and 2-4 Batteries, Inverters, and Chargers Test
- (9) SOV-2.33C Revision 0, Approved July 17, 1984
Booster Fire Pump Test
- (10) SOV-2.33C.01 Revision 0, Approved March 3, 1984
Fire Hydrant Flow and Pressure Test
- (11) SOV-2.11A.01 Revision 0, Approved May 18, 1984
Hydrostatic Test Pump Test
- (12) SOV-2.39.01 Revision 0, Approved September 6, 1984
2-5 and 2-6 Batteries, Inverters and Chargers Test
- (13) SOV-2.32A.01 Revision 0, Approved June 26, 1984
Demineralized Water System Test
- (14) SOV-2.33D.01 Revision 0, Approved July 19, 1984
Fire Detection System Test
- (15) SOV-2.45E.01 Revision 0, Approved March 15, 1984
Electric Fault Recording Test

- (16) SOV-2.41C.01 Revision 0, Approved February 17, 1984
Domestic Water System Test
- (17) SOV-2.44C.01 Revision 0, Approved July 25, 1984
Control Rod Drive Mechanism Shroud Cooling System
- (18) SOV-2.39.02 Revision 0, Approved March 2, 1984
Instrumentation, Annuncitaor Circuitry, and Emergency Lighting Systems
Test
- (19) PO-2.06.10, Revision 0, Approved March 27, 1985
Pressuriser Continuous Spray Flow
- (20) PO-2.06.13, Revision 0, Approved March 27, 1985
Reactor Vessel Head Vent System Test
- (21) PO-2.21A.02, Revision 0, Approved March 13, 1985
Main Steam Safety Valve Test
- (22) PO-2.47.02, Revision 0, Approved February 8, 1985
Containment Type C Leak Rate Test
- (23) PO-2.47.03, Revision 0, Approved January 15, 1985
Containment Type B Leak Rate Test
for the Personnel Hatch
- (24) PO-2.47.04, Revision 0, Approved January 15, 1985
Containment Type B Leak Rate Test
for the Equipment Hatch
- (25) SOV-2.41D-01, Revision 1, Approved March 28, 1985
Domestic Water System Test
- (26) SOV-2.34.02, Revision 0, Approved June 14, 1984
Instrument Air System Test