

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No.: 50-412/85-16

Docket No.: 50-412

License No.: CPPR-105

Category: B

Licensee: Duquesne Light Company  
Post Office Box 4  
Shippingport, Pennsylvania 15077

Facility: Beaver Valley Power Station, Unit 2

Location: Shippingport, Pennsylvania

Dates: July 1 - August 5, 1985

Inspectors:

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for E. A. Walton, Senior Resident Inspector

8/30/85  
Date

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8/30/85  
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8/30/85  
Date

Approved by:

*J. E. Tupp*  
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8/30/85  
Date

Inspection Summary: Inspection on July 1 - August 5, 1985 (Report No. 50-412/85-16)

Areas Inspected: Routine, unannounced inspection by three resident inspectors (269 hours) of activities pertaining to previously identified unresolved items and violations, 50.55(e) reports, information notices, inspection of piping supports, instrumentation tubing installation, material and equipment control with associated training information, preoperational testing of station batteries, review of licensee response to bulletins, information notices, generic letters and Part 21 reports, corrective action on nonconformance and disposition reports, 5 KV cable terminations, separation distance of cable from hot piping, off-center socket bore on globe valves, review of welding and associated weld procedures, and daily site tours.

Results: One violation was identified during this inspection concerning the lack of timely completion of corrective actions on nonconformance and disposition reports (see Details Section 4). Several new unresolved items were opened in the electrical area concerning 5KV cable terminations and separation distance of cable from hot piping. An additional unresolved item of potential significance was identified in the preoperational testing area. There appears to be inadequate QA oversight of the test program to assure that safety-related systems are satisfactorily tested in accordance with the criteria of applicable design documents. An anonymous allegation concerning excessive dust in the containment was received and satisfactorily dispositioned during the inspection period. Acceptable results were found in the review of licensee response to bulletins and generic letters, welding of the containment liner, and inspection of pipe supports and instrumentation tubing.

## TABLE OF CONTENTS

	<u>Page</u>
1. Persons Attending Exit Interview.....	1
2. Construction Site Walk-Through Inspections.....	1
3. Licensee Action on Previous Inspection Findings.....	1
4. Corrective Actions on Nonconformance and Disposition Reports (N&Ds) and Construction Deficiency Reports (CRDs).....	7
5. Hot Piping Separation from Electric Cable.....	8
6. Insufficient Thickness of Isolation Tape on 5KV Cable Terminations.....	9
7. Preoperational Testing - Station Batteries.....	9
a. Purpose.....	9
b. Design Function - Test Requirements.....	10
c. Testing Observed and Reviewed.....	10
d. Inspection Observations - Findings.....	10
8. (Open and Closed) Anonymous Allegations, RI-85-A-0079, Dirt and Dust in Containment Building.....	13
9. Inspection of Pipe Supports.....	14
10. Site Training Film.....	15
11. Welding on Containment Liner.....	15
12. Review of Specification for Instrumentation Installation.....	15
13. Off Center Counter Bores in Velan Valves.....	16
14. Overcurrent Trip Device Brown Boveri Model OD-4 or OD-5.....	16
15. Information Notice 84-55, "Seal Table Leaks at PWRs".....	17
16. Response to Generic Letters and Bulletins.....	17
17. Exit Interview.....	18

## DETAILS

### 1. Persons Attending Exit Interview

#### Duquesne Light Company

L. E. Arch, Senior Project Engineer  
J. J. Carey, Vice President - Nuclear Group  
R. Coupland, Director, QC  
D. W. Denning, Assistant Director, QC  
C. E. Ewing, Manager, QA  
S. D. Hall, Senior Compliance Engineer, Regulatory Affairs Department  
E. J. Horvath, Senior Project Engineer  
J. Hultz, Construction Liaison  
T. P. Noonan, Station Superintendent  
R. Wallaver, Compliance Engineer, Regulatory Affairs Department  
J. W. Walousky, Supervisor, QA

#### Stone and Webster Engineering

A. A. Dasenbrock, Senior Construction Manager  
D. Lessard, Assistant Superintendent, Engineering  
J. J. Purcell, Assistant Superintendent, Engineering  
R. C. Wittschen, Licensing Engineer

### 2. Construction Site Walk-Through Inspections

Daily tours of the construction site were made to observe work activities in progress, completed work, and plant status of the construction site. The presence of Quality Control inspectors and quality records were observed.

### 3. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (85-05-03), Resolution of N&D 2350: NRC Inspection Report 50-412/85-05 contained the details of a violation of Criterion XVI of 10 CFR 50, Appendix B, which requires that deficiencies and nonconformances be promptly identified and corrected. Specifically, N&D 2350 had been originally issued on October 8, 1982, and as of March 13, 1985, has not been unsatisfactorily dispositioned.

The inspector reviewed corrective actions taken by Stone and Webster's Site Engineering Group (SEG) to improve the management of the dispositioning of N&Ds. As documented in Site Memorandum 2BVM-3842 dated June 6, 1985, from Stone and Webster (H. W. Durkin) to DLC-SQC (R. Coupland), the SEG conducted a comprehensive review of non-dispositioned N&Ds and concluded that there was no widespread problem in other areas due to untimely dispositioning of N&Ds. Furthermore, N&Ds over 60 days old are identified monthly to project management with a brief description of the concern. The inspector discussed these corrective actions with SEG personnel to determine their implementation in the N&D process. The SEG did not begin to track by engineering discipline

the disposition of N&Ds until the issuance of an N&D status report on December 6, 1984. Then in March 1985, the SEG began to obtain better control of N&Ds by highlighting those N&Ds that were older than 60 days and had not yet been dispositioned. This information was included in the March 1985 SEG monthly report to the Stone and Webster Project Engineering Manager in Boston. The inspector reviewed subsequent SEG monthly reports and noted that the N&D portion of the report contains sufficient information to alert management if N&Ds are not under control from an engineering disposition standpoint. Based on the corrective actions taken and the review by the inspector, the inspector considered this item now closed. Although N&D dispositioning (on which this item is based) has improved, a new violation involving the corrective actions associated with the dispositioned N&Ds has been identified during this inspection (see Section 4).

(Closed) Noncompliance (84-18-01), Storage Requirements for Reactor Coolant System Piping and Valves; (Closed) Noncompliance (85-02-01), Inplace Storage Controls of Mechanical Equipment; and (Closed) Unresolved Item (85-04-01), Inprocess Storage Controls of Instrument Manifold: The above listed noncompliances and unresolved item resulted from the licensee's failure to adequately control the storage of safety-related components during installation and inplace storage.

The licensee has implemented the following corrective actions:

- The establishment of a Composite Review Work Group (CRWG) which has as its objectives (a) identifying any instances where equipment maintenance requirements are not clearly specified or not practical to implement, and (b) identifying any noncompliances which may exist within permanent plant buildings/areas with respect to the inplace storage and maintenance requirements of Specification No. 2BVS-981 for Category 1 equipment only.

Both satisfactory and unsatisfactory conditions identified by the CRWG will be documented via the use of Site Quality Control (SQC) Inspection Reports. The CRWG began its inspection efforts on January 1, 1985.

- To provide management accountability, a Management Oversight Committee (MOC) was formed to review the report published by the CRWG and Management Committee on Storage Review (MCSR) to assess the overall program effectiveness, and to recommend program changes or other actions consistent with prevailing project conditions. The MOC draws its membership from the A/E Stone and Webster Construction Engineering, the two prime subcontractors Sargent Electric and Schneider Power, and DLC SQC. It began functioning in February, 1985.

The inspector reviewed numerous daily inspection summary reports of stored items to ascertain controls in the storage areas. This review found that the storage in general is good. Some minor deficiencies are being found by the licensee's inspectors, such as barrier rope and signs improperly erected in nine instances. In each case identified the inspector found the licensee taking corrective actions.

The inspector reviewed the licensee's actions on these items and found adequate controls are now being implemented. In addition, during the daily site tours, the inspector observed good storage practices for installed components. The inspector found all areas reviewed acceptable and these items are closed.

(Closed) CDR (85-00-01), Inadequate Torqued Bolts for Electrical Support Connections; (Open) Unresolved Item (84-16-03), Spring Nut Retorquing Program: This item was reported to the NRC in accordance with the requirements of 10 CFR 50.55(e) because bolts with spring nuts used on electrical raceways were installed by construction to an unspecified torque and because applicable engineering documents did not specify the minimum acceptable torque values recommended by the manufacturer. The licensee has determined that these bolts might not provide adequate load carrying capability parallel to the axis of the support channel unless they were properly torqued. The licensee has issued an Engineering and Design Coordination Report (E&DCR) which specifies torque requirements.

On March 25, 1985, the licensee issued a final report on this subject and advised that any further correspondence regarding this matter will be issued as part of the activities for a related unresolved item (84-16-03), which discusses the licensee's corrective actions on this matter. Therefore, this CDR is closed and unresolved item 84-16-03 will remain open pending further torquing of the spring nuts by the licensee and subsequent reviews by the inspector.

During this inspection period, the inspector reviewed the Field Construction Procedure (FCP-419), "Springnut Torquing Program," and witnessed on the back shift, the torquing of approximately 100 springnuts. In addition, the inspector reviewed the Quality Control Inspection Procedure (IP-8.1.8) and discussed the procedures with the Quality Control Inspectors, as well as witnessing QC's involvement in the torquing program. At the end of this inspection period, the licensee had completed the torquing of approximately 13,000 springnuts. The licensee plans to continue a systematic program of torquing the springnuts on a back shift basis, until all springnuts are torqued. All items reviewed by the inspector were found acceptable. The unresolved item will continue open to monitor the program.

(Closed) Unresolved Item (84-07-01), Administrative Controls for System Turnovers: This item was initially raised in NRC Inspection Report 50-412/84-07. At that time, the inspector questioned the manner in which portions of the service water system had been turned over from construction to the startup group. The inspector was concerned that systems were being accepted from construction prematurely as evidenced by an open items list containing 600 open items related to portions of the service water system recently accepted by the startup group. The inspector considered that this did not meet the intent of the requirements of Regulatory Guide 1.68, Initial Test Program for Water Cooled Nuclear Power Plants. Regulatory Guide 1.68 requires that the construction or installation of structures, systems, and components should be essentially completed to the degree that outstanding construction items could not be expected to affect the validity of the test results. The in-



spector indicated that the licensee should develop explicit administrative controls to assure that the Regulatory Guide 1.68 requirements are met prior to system or subsystem turnover.

Additional inspection was performed on this item as reported in NRC Inspection Report 50-412/85-12. However, at that time, the licensee's startup organization was being revised to combine two groups, the Construction Startup Group and the Operations Startup Group, into one Startup Group (SUG). To reflect this organizational change, FCP-51, "System Subsystem Turnover to DLC-SUG," had to be revised.

The inspector reviewed the current status of turnover process by reviewing FCP-51 and FPC-56, "Subsystem Completion Inspection Program," and discussing the implementation of these procedures with various DLC-SQC and DLC-SUG personnel. Also, the inspector reviewed the turnover packages for two subsystems turned over to DLC-SUG in early July 1985 - System Release (SR) 7-1.B, "Primary Grade Water and Boric Acid Supply," and System Release (SR) 7-1.H, "Boric Acid Transfer Pumps, Batch Tank and Portions of Transfer System." These subsystems are part of the Chemical Volume and Control System.

The turnover process for a given system is initiated approximately nine months prior to the scheduled turnover date when the designated test engineer in the DLC-SUG receives a scoping package for the system from SWEC. The DLC-SUG test engineer then develops subsystem packages based on various needs as follows: (1) construction status, (2) current testing priorities, and (3) future testing priorities. This set of subsystem packages then defines a total system package for construction to build in accordance with a desired schedule. Each subsystem package is sent from DLC-SUG to SWEC six (6) months prior to the scheduled turnover date.

The inspector determined that FCP-51 had been revised to reflect the organizational change of the DLC-SUG to one group. Also, FCP-51 references FCP-56 which requires SWEC Construction to notify SQC to perform a Completion Inspection. FCP-56 is a relatively new procedure (April, 1985), and establishes the method for implementing a Completion Inspection on construction installation work prior to release of a subsystem for turnover to the SUG. The purpose of FCP-56 is to reduce to a minimum the number of construction open items at time of turnover. The inspector reviewed the open items associated with SR 7-1.B and SR 7-1.H and considered that the total number of open items were manageable consistent with accepting these subsystems for test. There were 72 open items reported for SR 7-1.H as of July 12, 1985, with at least 12 of these items being drawing updates (i.e., no hardware changes were required). Also, in addition to the SQC completion inspections conducted as part of FCP-56, SQC participates in the SUG walkdown of a system or subsystem to conditionally accept the system for initial testing. SQC participation at this point ensures that the results and condition existing at the time of the QC inspection have not be invalidated.

Based on the above inspection, the inspector concluded that the turnover process is acceptable. This item is now closed.

(Closed) Noncompliance (85-05-01), Control of Hold Tags: This violation resulted from the licensee's failure to remove reject/hold tags from components after the nonconforming conditions were corrected. Craft persons were observed working on these components with the reject tag affixed to the component.

The licensee has taken the following corrective actions in these areas:

A review of applicable logs was made to identify those situations where Hold/Reject tags had been listed as missing or where no disposition of the tag was entered. A total of 418 tags met one or the other of these conditions. A site inspection was initiated by the Mechanical, Electrical, Structural, Receiving, Surveillance, and System Release SQC Groups resulting in 65 expired tags being removed and destroyed. Three hundred fifty-three (353) tags could not be found and are presumed lost or destroyed.

The main problem areas were in the SQC Mechanical and Receiving discipline. The SQC Surveillance activity has a possible outstanding problem as this group rejected items because they were improperly protected or stored. Subsequently, these items have been cleaned and wrapped with plastic. It is probable that a few of the tags, recorded as missing by this group, are in fact, wrapped up with the item. The licensee decided to leave the protective wrapping intact and look for expired tags when the protection is removed. This will be an ongoing activity.

To prevent further nonconforming conditions from occurring in this area, the licensee has taken the following actions:

- SQC-4.4, "Nonconformance and Disposition Reports," and SQC-4.6, "Construction Deficiency Reports," have been revised to require that written or physical evidence that the tags have been removed be presented prior to the close of the document.
- SQC-4.4, "Nonconformance and Disposition Report," has been revised to require the removal or revision of related tags prior to stamping "Not Issued" on the document when the N&D Report is not issued following a review by SQC.
- A training program for SQC personnel reflecting the revised requirements has been completed.
- Construction Management has reiterated the importance of SQC Hold/Reject tags to the contractors as it affects their activities.

The inspector reviewed the above referenced revised Site Quality Control procedures and performed numerous site inspections in this area and verified adequate corrective actions were taken. This item is closed.

(Closed) Unresolved Item (84-18-02), Valve Actuator Interference with HVAC: This item was unresolved because during a site tour, the inspector noted that manual operation of valve 2-SIS-MOV-863A, was restricted due to handwheel obstruction with an HVAC duct. The valve is installed in line 2-SIS-008-5-2 and shown on Isometric Drawing 108104-3A and located in the Safeguards Building, Elevation 732. The inspector reviewed the licensee's corrective actions in this area and observed the following:

- The line has been reworked and put on its correct location. It is now physically possible to open and close the valve.
- The Integrated Construction Support Group is actively involved in these type problems and gets directly involved in their resolution.
- All applicable Nonconformance and Disposition Reports on this problem have been resolved and closed.

The inspector reviewed the licensee's corrective actions on this matter and performed visual inspection of the installed condition.

Based on this review, this item is closed.

(Open) Noncompliance (85-04-02), Instrument Tubing Separation: This violation identified that redundant safety-related instrument lines failed to meet the 4 ft. minimum separation criterion specified in the governing specification. In addition, the inspector was concerned that no Quality Control inspections were being performed to assure minimum separation was achieved. This inspection only addresses the licensee's position regarding QC inspection of redundant safety-related instrumentation lines.

Effective July 22, 1985, a revision was issued to Inspection Procedure IP-7.2.9 which requires QC inspection to be performed in order to assure that the tubing configuration and separation are correct. Any deviations from these criteria will be reported to Engineering for disposition. The revision to IP-7.2.9 specifically was revised to require inspections in the following areas:

- Inspections of the location of the instrument and instrumentation source connection in reference to building column lines and elevation will be performed.
- Inspections of the location of supports, in reference to the dimensions from bend/fittings, etc., shown on the isometric drawing utilizing the axial tolerances shown on the support drawing, will be performed.
- Inspection of the tubing lengths will be performed using a tolerance of  $\pm 1"$ .
- Inspections of tubing slope will be performed, and in the event allowance to use the 3/8 inch per foot slope is needed, the additional measurements required by the spec. will be obtained.



- Inspection to ensure violations to the redundant spacing criteria do not exist will be performed.

The licensee implemented the above inspection program the week of July 22, 1985. In addition to the inspection by QC of all new installation, all previously installed instrumentation lines will be inspected by QC to the revised criteria. This item will remain open pending further review by the inspector.

4. Corrective Actions of Nonconformance and Disposition Reports (N&Ds) and Construction Deficiency Reports (CDRs)

Criterion XVI of 10 CFR 50, Appendix B, requires that measures be established to assure that conditions adverse to quality, such as nonconformances, are promptly identified and corrected. The inspector audited numerous N&Ds and CDRs to ascertain the licensee's program adequacy in this area. The review was made on a sample basis for CDRs which were open greater than six months without being dispositioned as closed and N&Ds which were open greater than 1½ years without being dispositioned as closed. The following deficiencies were found:

- Some N&Ds and CDRs issued as far back as 1979 are still open and have not been reviewed by the licensee or contractor to assure they are corrected in a timely manner. In many of the items reviewed, it is appropriate for them to still be open; however, the inspector identified some which were not corrected in a timely manner. This resulted because the licensee does not have a program to perform reviews of open N&Ds and CDRs to determine what is an appropriate time limit to perform corrective actions.
- Some CDRs and one N&D issued approximately one year ago and longer, have not been dispositioned for corrective actions. For example, CDRs 4033, 4034, 4035, 4036, 4037, 4039, 4040, 4041, 4046, 4047, 4053, 4054, 4062, 4064, 4065, 4067, and 4071 were issued around August 1984. As of August 2, 1985, no disposition of the deficiencies was made on the CDRs. N&D Number 2009, issued February 24, 1982, was apparently inadvertently misplaced by QC and as of August 2, 1985, no disposition had been made to initiate corrective actions. As of August 6, 1985, this material could not be located and may have been installed.

The inspector determined from this review that the licensee or contractor has not adequately provided a program to assure timely implementation for disposition of nonconforming items.

- Nonconformance and Disposition Report Number 6758 issued May 26, 1983, stated that non-approved fluorescent tape was applied to the surfaces of stainless steel piping, and possibly contained chlorides, halogens, and sulfur. Stone & Webster Engineering dispositioned the N&D on June 30, 1983, and required the tape to be removed, the areas buffed to remove possible surface contaminants, then washed with demineralized water to remove residuals.

As of July 18, 1985 (two years later), the piping contractor had not implemented corrective actions.

The inspector found neither the licensee nor the contractor has implemented a program which will assure nonconformances are corrected in a timely manner.

Further reviews performed by the inspector of the licensee's program in this area found that Stone & Webster Engineering has a program to assure N&Ds within the engineering group are dispositioned in a timely manner. However, for N&Ds sent out of the engineering group for further information, such as N&D 2009, no program exists to assure they are returned in a timely manner and dispositioned. Further, no program exists to assure CDRs are dispositioned in a timely manner to assure corrective actions are implemented and no program exists to assure corrective actions are taken in a timely manner on N&Ds and CDRs after they are dispositioned.

The inspector found the licensee has an adequate tracking system to assure that all N&Ds and CDRs will eventually be dispositioned and closed; however, failure to provide measures to assure nonconformances are promptly corrected is a violation of 10 CFR 50, Appendix B, Criterion XVI (85-16-01).

#### 5. Hot Piping Separation from Electrical Cable

Stone and Webster Engineering advised the inspector that comments were received at another site suggesting that cable installation was performed with inadequate consideration given to the impact on cable due to temperature effects from nearby hot piping. The current electrical installation specification 2BVS-931, has a 6-inch clearance requirement for cable and large bore hot piping. However, this clearance requirement is strictly to prevent physical cable damage for seismic considerations. Specifically, the comments received indicated that cables (especially power cables) should be physically separated from hot piping or surfaces a sufficient distance consistent with rated current capacity of the cable and consistent with qualification data of the cable itself. If such requirements are not taken into consideration for the cable installation, then possibly cables would operate at high environmental temperatures than allowable.

Stone and Webster Engineering is proceeding with an electrical evaluation to define the problem and its solutions. Electrical and heat balance calculations must be performed to numerically bound the problem. Upon completion of this effort, Engineering will be able to define to construction what changes to 2BVS-931 and associated FCPs are necessary. The construction trades and SQC will require training in these new requirements.

Preliminary results of the engineering evaluation indicate that the installation of control cable (designated C&X cable) will not be affected due to low operating currents in control cable. Additional work needs to be performed for other cable. Also associated with the new spatial requirements, there will be new inspection requirements generated for newly installed cables. However, these new inspection requirements must be applied to cables already

installed to determine final acceptance. This may entail rework of existing cables to meet the new spatial requirements. In any case, a program of re-inspection, evaluation, and possible rework of existing cables must be conducted to determine final acceptance. Also, Stone and Webster is evaluating this issue for reportability per the requirements of 10 CFR 50.55(e). This item will be carried as unresolved pending the completion of an engineering evaluation which addresses the effect of hot piping on the current carrying capacity and the insulation deterioration of electrical cables and appropriate inspection effort to determine final acceptance of existing cables and cables to be installed to the new requirements (85-16-02).

6. Insufficient Thickness of Insulation Tape on 5KV Cable Terminations

The inspector was advised on July 22, 1985 of a discrepancy between Stone and Webster Engineering and the manufacturer's (Kerite Company) requirements concerning the specified number of layers of insulating tape required for terminating 5KV power cables. A review of SWEC drawing 12241-RE28A-4, which specifies the method and materials for terminating 5KV power cables to motor pigtails and other miscellaneous equipment, indicated that the specified number of layers of insulating tape did not agree with the manufacturer's (Kerite Company) requirements. Details G, E-1, and F on drawing 12241-RE28A-4 result in a total thickness of 120 mils of insulating tape, as compared to the 500 mil thickness recommended by Kerite Company.

E&DCR 2P-4757, issued on July 18, 1985, requires all deficient 5KV cable terminations to be reworked to achieve the manufacturer's recommended thickness of insulating tape. Drawing 12241-RE28A-4 has been revised by E&DCR 2P-4757 such that details E-1, G, and F reflect the manufacturer's termination requirements.

Subsequent discussions with the licensee indicated that this issue was being reviewed by Stone and Webster Engineering for reportability to the NRC per 10 CFR 50.55(e) in accordance with Stone and Webster Engineering Assurance Procedure 16.2. Also, other details on suspect termination drawings must be reviewed for consistency with manufacturer's specified requirements. This item is unresolved pending rework, reporting, and evaluation of other cable terminations (85-16-03).

7. Preoperational Testing - Station Batteries

a. Purpose

Construction Proof and Preoperational Tests of station batteries 2-3 and 2-4 were reviewed to assure that all testing required to demonstrate satisfactory performance was identified and performed in accordance with approved procedures that incorporate the requirements and acceptance limits contained in applicable design documents. Additionally, portions of the preoperational test for station batteries 2-3 and 2-4 were observed during the week of July 29, 1985, to verify test conduct per approved administrative controls.

b. Design Function - Test Requirements

The Class 1E DC power system is composed of a 125V battery, battery charger and distribution switchboard for station batteries 2-1 and 2-2, and a 125V battery, vital bus inverter and rectifier/charger for station batteries 2-3 and 2-4. Batteries 2-3 and 2-4 provide 125V DC dedicated power to their vital bus inverter only and services no other load, while batteries 2-1 and 2-2 also pick up switchgear, diesel generator-field, ESF actuation, emergency lighting, and RPS loads. Section 8.3 of the BVPS-2 FSAR identifies the capacity requirements of these batteries as 183 ampere for the two hour duty cycle representing the required supply to the vital bus inverters. Each DC subsystem has a charging component sized to supply all normal continuous loads and to simultaneously recharge the battery following its designed two hour duty cycle discharge, to its fully charged condition in 24 hours. Cell voltage is limited to a maximum of 2.33 volts under equalizing charge conditions. Total capacity for the 2-3 and 2-4 subsystems are 1140 ampere hours (Ah) each. At the conclusion of the two hour test, cell terminal voltage should not drop below 1.84 volts.

The FSAR notes that provisions are made in the DC power system so that service tests can be performed in accordance with IEEE Standard 450 - 1975, Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

c. Testing Observed and Reviewed

Construction proof tests 2T-LTG-38B-2.03 (2.04), Revision 1, Battery 2-3 (2-4) Test Discharge, completed July 22, 1985.

Preoperational Test PO-2.39.03, 2-3, and 2-4 Batteries, Inverters, and Chargers Test, observed during the week of July 29, 1985.

No inspection was performed on station batteries 2-1 and 2-2 due to their removal from BV-2 and installation at BV-1.

d. Inspection Observations - Findings

- (1) During performance of OP-2.39.03, the inspector noted that a QA surveillance was conducted in the field. Discussions indicated that the purpose of the surveillance was to verify compliance with the various test program administrative controls as well as test procedure adherence. The inspector was informed that there are currently two DLC QA auditors performing this function. Several more are expected to be added as the preoperational work load increases.

The Design and Construction QA Program, Section 11, Test Control, places the responsibility for assuring that sufficient testing is performed on structure systems and components such that they will performed within the limits specified by the design documents on

DLC. The inspector noted that the above QA surveillance could only assure that the acceptance criteria already specified in the test procedure was met, and did not assure that the procedure adequately tested the system to the functional requirements assumed in the FSAR. Preoperational tests are typically written by contractor personnel, and are reviewed and approved by the line organization responsible for conducting the tests. This was brought to the QA Manager's attention. Followup to determine how the DLC QA group intends to independently assure that the various test procedures, whether system operability verification (SOV) or preoperational (PO) tests, adequately demonstrate the functional capability of safety systems is unresolved item (85-16-04). Implicit in this, is the identification of what those functions are, and what the sample size should be.

Because of the amount of testing envisioned, the inspector was concerned that a sufficient number of QA personnel have not been assigned to the test program. The QA Manager informed the inspector that current plans call for a DLC compliment of one supervisor and five auditors, supplemented as necessary by contractor personnel. This appears to be a reasonable approach and the inspector had no further concerns at this time.

- (2) Quality Control is currently provided by the Site Quality Control (SQC), composed mostly of non-Duquesne Light contractor personnel under the program guidance of the Design and Construction QA Program. The DLC Operations QC program comes into effect with the operations QA program, 90 days prior to fuel load. SQC is responsible for the construction phase, and maintenance and rework during the testing phase. These QC activities are typically performed with detailed SQC developed procedures and attributes lists. When the operations QC program is put into effect, all corrective and preventive maintenance procedures used by the station will have been previously reviewed by OQC and have had specific hold points specified. Hence, there is a difference between the methodology employed by the two QC programs.

Currently, there are about 185 out of 450 subsystems turned over to the startup and test group. As these subsystems are accepted by the station, routine preventive maintenance becomes the responsibility of the station. This maintenance will initially be under the SQC program and will eventually be phased into the OQC program. Discussions with the QA Manager indicated that the station has not yet determined how to administratively phase in the OQC program during startup. Further review of this area is Inspector Follow Item (85-16-05).

- (3) During testing of battery 2-4, the inspector noted four red tags indicating rejectable conditions on the rectifier equipment. This along with the outstanding items list was discussed with the lead



test engineer to verify that no condition existed that would invalidate the test results. The inspector was informed that such a review was performed though not documented in the preop test procedure. The results of the review indicated that station batteries 2-3 and 2-4 could be tested as is. However, a discrepancy exists between the inverter rated output and the actual measured output. Further followup in this area is Inspector Follow Item (85-16-06).

- (4) The inspector reviewed the results of Construction Proof Test 2T-LTG-38B-2.03. This test references IEEE Standard 450-1980 for performing the discharge test to verify capacity requirements. The inspector noted that the FSAR referenced the 1975 version of this standard and should probably be updated to reflect the actual plant tests performed. The battery capacity requirements of the test discharge appear to have been met with a discharge current calculated at about 187.1 amps running for 5.2 hours until a terminal voltage of 110.4V DC was achieved. Battery capacity was calculated to be above 104%.

The test critique associated with the construction proof test identified a problem with the sizing of the breaker from MCC 2-23, cubicle 3E to MCC 2-E05, cubicle 1D, to support the demand current necessary for recharging battery 2-3. The same problem was applicable to battery 2-4. The inspector discussed this with the test engineer and was informed that a station work request was issued to replace the 40 amp breaker with a 70 amp breaker per E&DCR 5145. The inspector asked the test engineer whether or not the same problem would be applicable to batteries 2-1 and 2-2, when they were installed, and was informed that this is currently being reviewed and tracked on licensee's open item list. The inspector had no further concerns at this time.

The initial test of battery 2-3 was terminated about 15 minutes into the initial battery run when it was noted that the rectifier current did not go to zero as expected. The one-line diagram, No. 10080-RE-1AW, Revision 4D, was reviewed against the field installation. It was found that the amp meter was installed downstream of the battery tie into the inverter and not upstream as indicated on the panel mimic. It was determined that this would not impact the testing. The licensee informed the inspector that both drawings for batteries 2-3 and 2-4 would be updated and a review conducted to verify that battery 2-1 and 2-2 drawings were also correct. The one-line drawings were prepared by Stone & Webster for use by operations, and not for quality control inspection. Because of the complexity of the vendor supplied equipment, no point by point check was conducted, nor required. The inspector had no other concerns.

Checks of the preferred power supply loaded with vital bus to more than 183 amps for one hour with an inverter output voltage at 117.6 to 122.4 volts AC was successfully completed for Bus 2-4. The service test of battery 2-4 was also successfully conducted to the requirements referenced in Section 7.b.

- (5) During inspection of the battery hardware installation, the inspector noted that the metal seismic supports were of a similar design to that used at Unit 1. The problem identified there was that as the batteries age and expand against the non-yielding metal surface, cell cracks develop. Inspector discussions with Unit 1 personnel familiar with equipment qualification testing indicated that batteries subjected to seismic loads also fail at this metal/battery cell interface. The inspector questioned the Unit 2 station superintendent as to whether or not this item was considered in the seismic analysis of the Unit 2 batteries. The inspector was informed that the Unit 2 response would be developed after the Unit 1 problem was resolved by NECU. No time constraints currently exist and resolution of this problem will be tracked as Inspector Follow Item (85-16-07).
- (6) Another utility issued a Part 21 Report in June 1984, concerning the uninterruptible power supply batteries supplied by Exide, Inc. These are the same batteries used at Unit 2. The problem centered around cracked boss seals found on many cells resulting from nodular corrosion of the lead posts. This corrosion causes additional stress on the plastic components of the cover and may expose the copper insert inside the battery posts to the acid resulting in copper contamination of the negative plates. In turn, this reduces the current carrying capability of the battery. Determination of whether or not BV-2 battery cells are of the same type (E size cells, Type EC11), referenced in the Part 21 Report, or subject to a similar failure mode, is Inspector Follow Item (85-16-08).

8. (Open and Closed) Anonymous Allegation, RI-85-A-0079, Dirt and Dust In Containment Building

On July 16, 1985, an anonymous allegation was received at the NRC Region I Office. The allegor was concerned about the increasing amount of dust in the air in the reactor containment building which could affect motors, pumps, and valves. The allegor advised the dust was particularly bad in the Containment Building at the Residual Heat System (RHS) platform area.

On July 22, 1985, the inspector performed a visual inspection of all accessible elevations of the Containment Building and assessed the housekeeping practices, general cleanliness of the floors and equipment, air quality (dust), and protection of safety-related equipment from any airborne contaminants. On July 23, 1985, the inspector repeated the inspections in the same area to observe if dust conditions possibly increased. The following conditions were observed by the inspector:

- Considering the site is under construction, which generally creates a certain amount of dust, only minimal dust was observed.
- All sensitive equipment such as motor operated pumps and valves, and electrical equipment was protected from any airborne contaminants by a plastic covering which envelopes the critical components. These requirements are specified in the 2BVS-981 storage specification.
- Housekeeping throughout the Containment Building was generally good. The inspector did note that the RHR platform area housekeeping was not up to the same standard as the rest of the containment. The platform area contained candy wrappers, empty soda cans, nails, and dirt. All motors and sensitive equipment in the area was adequately protected.

The inspector advised the licensee that the condition noted at the RHS platform was not an unacceptable condition; however, it was not up to the same cleanliness as the rest of the Containment Building. The inspector revisited the area the next day and noted that the area was significantly cleaner.

Based on inspection performed by the inspector, it was determined that this allegation was not substantiated. A certain amount of dust is expected at a construction site. However, the inspector did not find any unusual amounts of uncontrolled dust. Further, housekeeping is an item which changes daily on a construction site and requires constant attention. The inspector found housekeeping was adequate and daily attention is given to housekeeping conditions. Lastly, and most important, the licensee has adequate protection on all sensitive equipment from the normal expected airborne contaminants.

This item is closed and no further action is required.

#### 9. Inspection of Pipe Supports

The inspector selected five completed and Quality Control inspected and accepted pipe supports to perform a detailed inspection to ascertain compliance with NRC requirements. The supports selected were:

- 2-CHS-PSA-083
- 2-SIS-PSR-315Y
- 2-SIS-PSR-256S
- 2-SWS-PSR-250S
- 2-SWS-PSR-249S

The review included visual inspections using weld gages and measuring devices to determine if minimum fillet weld size was achieved, supports were on location, and support material was the correct size and composition. The inspector obtained the most recent revised isometric drawing and verified QC had performed inspection to the latest revision. The inspector verified the QC inspections were accomplished in accordance with the applicable Inspection Procedure IP-7.3.1. In addition, on support number 2-SIS-PSR-315Y, the in-

spector reviewed the calculation applicable for this support (1224-NP (N)-Z-31A-011, Revision 2) to ascertain that the support material and sizes were adequate.

All areas reviewed by the inspector were found acceptable. No items of non-compliance were identified.

10. Site Training Film

The inspector performed an audit of a training film being given to Site Quality Control Inspectors. The film is scheduled to be given to all QC inspectors and Manual and Non-manual personnel onsite. The film titled, "Material Control and Equipment Storage Program," is designed to highlight the importance of onsite storage controls and give training in some recent storage changes. The film is very concise, and covers the important areas of storage controls. The inspector found the training film an excellent method to convey the importance of long term in-place storage of nuclear safety-related components. This program was found acceptable and no items of noncompliance were identified.

11. Welding on Containment Liner

The inspector audited the activities relative to closing the reactor containment building construction opening. The areas audited included weld prepping, fitting, tacking, and welding the containment liner. The inspector verified the weld procedures for tacking and welding the liner were qualified in accordance with essential variables, such as material thickness, preheat, electrode composition, and weld positions. All areas reviewed were found acceptable. No noncompliances were identified.

12. Review of Specification for Instrumentation Installation

The inspector performed a detailed review of portions of the Instrumentation Specification 2BVS-977, to ascertain compliance with NRC and other applicable requirements. The review included the allowable provisions for tubing run configuration, support location, use of axial restraints, interference offsets, thermal expansion clearances, flex hose installation, base plate installation, shimming provisions of base plates, allowable vertical span between supports and locking of hilt bolts.

Specification 2BVS-977, Figure 6, described allowable tubing offsets to be used in the field when interference with other components is encountered. For example, the figure shown on Appendix B and text contained on Pages 1-55 of this specification, allows up to 12 inches of offset in any direction to avoid interference with building configurations and other similar interferences. As stated in the text, the offset scheme described above is qualified for use.

The inspector questioned the Engineering Department regarding the allowance of a vertical offset in a horizontal run instrument tubing due to moisture traps. After review, the Engineering Department advised the inspector that Figure 6 on Appendix B and the text discussing offset on Page 1-55 would be deleted.

On July 25, 1985, E&DCR Number 2PS-4009 was issued by Engineering and deleted Figure 6 and all reference to it in the text of 2BVS-977. Based on this E&DCR change, the inspector found this area acceptable. All areas reviewed were found acceptable and no items of noncompliance were identified.

13. Off Center Counter Bores in Velan Valves

Another licensee (Gulf State Utilities) had reported a problem concerning off center counter bores in 3/4-inch, 600# globe socket valves purchased from Velan. It was determined during evaluation of the off center counter bores in these valves that minimum wall had been violated. In some cases, the thin side of the socket violated minimum wall according to ASME III, and the land was not large enough to afford proper weld thickness. It was reported that the problem could be generic to other Velan customers. Accordingly, the inspector raised this concern with the licensee to determine any impact at BVPS-2.

Stone and Webster Engineering investigated this concern and determined that possibly valves on two (2) purchase orders could have been affected - PO-2BV-75, "Stainless Steel Valves 2-inch and Smaller, ASME III," and PO-2BV-96, "Stainless Steel Valves 2-inch and Smaller, ANSI B31.1." Stone and Webster Engineering discussed this matter with Velan and Velan responded by letter on June 25, 1985, indicating that they felt there was not a problem with the valves for BVPS-2. Specifically, Velan noted that the BVPS-2 valves were stainless steel and not carbon steel (as in the case of the Gulf States contract) and considering that each valve was inspected by Velan and licensee inspectors prior to shipment, Velan felt that a similar problem did not exist. Based on this information, the inspector considered this item acceptable.

14. Overcurrent Trip Device Brown Boveri Model OD-4 or OD-5

A Part 21 Report was issued by Brown Boveri on May 13, 1985, concerning the inadvertent installation of an incorrect short time delay band level (link) in the electro-mechanical overcurrent trip device for certain K-line circuit breakers. The use of this link could limit the travel of the short time armature and cause the short time element to be inoperative in the maximum band. This condition could have occurred in the trip device Models OD-4 and OD-5. Beaver Valley had purchased one (1) breaker that was potentially affected. The Part 21 Report provided instructions for making a visual inspection to determine if the correct link had been installed in the circuit breaker.

The inspector brought this matter to the attention of Site Quality Control. On July 3, 1985, Quality Control performed a visual inspection on the K-600 Brown Boveri OD-4 circuit breaker procured on PO-C-500266. This inspection



was conducted to determine which short time delay band lever link P/N 707970K1 was installed in the circuit breaker. The inspection was performed using Figure 17 from the Installation/Maintenance Instructions Manual IB 6.1.2.7-1C and Attachment 2 from letter 2DLC-8260, Request for Response to PRC-85-14, dated July 9, 1985. The inspection verified that the correct short time delay band lever links (2 each) P/N 707970K1 were installed in the K-600 Brown Boveri OD-4 circuit breaker. Based on this information, the inspector considered this item acceptable.

15. Information Notice 84-55, "Seal Table Leaks at PWRs"

Information Notice 84-55, "Seal Table Leaks at PWRs," concerned two events involving reactor coolant leaks from incore thimble seal tables. Both events occurred during maintenance on the incore thimbles while the RCS was at an elevated pressure and temperature.

As indicated in Paragraph 16 of this report, the DLC Nuclear Construction Division (NCD) Procedure 3.6.2, "Position Statement Development," contains the detailed steps that are followed to develop the licensee's position regarding NRC bulletins, circulars, notices, and generic letters. The inspector reviewed various licensee documentation that developed to formulate their Position Statement in response to Information Notice 84-55. The primary lesson to be learned from the seal table incidents was that cleaning of incore thimbles should not be considered a routine maintenance procedure to be done during reactor power operation. Rather, cleaning of incore thimbles should be done during scheduled outages with the primary system depressurized. Such precautions and recommendations were provided to DLC by Westinghouse via Technical Bulletin NSD-TB-84-09, "Leaks at Seal Tables." Accordingly, the DLC Startup Manager was directed by the Vice President, Nuclear Construction Division via letter (2DLC-7905, 2/7/85) to incorporate the appropriate Westinghouse bulletin information into maintenance procedures being developed.

The inspector discussed this matter with personnel in the DLC Startup Group responsible for maintenance procedures. Currently, Corrective Maintenance Procedure 2-3RII-ND-A-B-C-D-E-41, "Flux Mapping System Thimble Retraction and Installation Procedure," is written such that the reactor must be in Mode 6 to perform the procedure. Additionally, the procedure will be updated to reflect the precautions and recommendations in Westinghouse Technical Bulletin NDS-TB-84-09. This item is being tracked on DLC Work Tracking System as Item #001088.

Based on this review, the inspector found the licensee's actions in response to Information Notice 84-55 acceptable.

16. Response to Generic Letters and Bulletins

Nuclear Construction Division Procedure 3.6.2, "Position Statement Development," was developed to establish the licensee's method for responding to NRC bulletins, circulars, notices, and generic letters. Personnel in the Regulatory Affairs Department are responsible for coordinating the licensee's re-

sponse on such issues. A key item that is utilized in tracking the status of the correspondence related to these issues is the computer program M.O.N.A.R.C. (Monitoring of NRC and Regulatory Correspondence).

The inspector reviewed the licensee's response to various bulletins and generic letters. The purpose of this inspection was to determine if the licensee was responding to these issues in a controlled and organized manner and if the response was timely. With respect to bulletins, the inspector reviewed the documentation associated with all bulletins issued from January 1, 1980. Reviews of the documentation for generic letters 84-10, "Administration of Operating Tests Prior to Initial Criticality," and 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events," were conducted. The inspector determined that in all cases, the licensee's response to these matters was transmitted to the NRC within the time period stated in the bulletin or generic letter. The Regulatory Affairs Department has a separate file for each bulletin and generic letter. These files, in conjunction with the use of M.O.N.A.R.C., provide good administrative control for each issue. All areas reviewed were found acceptable. No noncompliances were identified.

17. Exit Interview

A meeting was held with the licensee's representatives indicated in Paragraph 1 on August 5, 1985, to discuss the inspection scope and findings.