



## Duquesne Light

Nuclear Construction Division  
Robinson Plaza, Building 2, Suite 210  
Pittsburgh, PA 15205

2NRC-4-060  
(412) 787-5141  
(412) 923-1960  
Telecopy (412) 787-2629  
May 17, 1984

United States Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

ATTENTION: Mr. Richard W. Starostecki  
Division of Project and Resident Programs

SUBJECT: Beaver Valley Power Station - Unit No. 2  
Docket No. 50-412  
USNRC IE Inspection Report No. 50-412/84-03

Gentlemen:

This is in response to the Items of Violation and the Item of Concern cited in Inspection No. 50-412/84-03 and listed in Appendix A (Notice of Violation) attached to your letter to Mr. E. J. Woolever, dated April 16, 1984. On May 14, 1984, an extension was requested from Region I of the NRC to submit this response by May 18, 1984, and was granted.

### Notice of Violation

As a result of the inspection conducted on February 22 through March 23, 1984, and in accordance with the NRC Enforcement Policy (10CFR2, Appendix C), published in the Federal Register on March 8, 1984 (49FR8583), the following violation was identified:

- A. 10CFR50, Appendix B, Criterion VII requires that measures shall be established to assure that purchased material . . . conform to the procurement documents.

Contrary to the above, as of March 23, 1984, the exciter control panels electrical wiring was not securely fastened to the panels as required by the ordering specification.

### Response to Violation A

The requirements, included in Specification No. 2BVS-230, for arrangement and clamping of electrical wiring inside the panels, in part, are as follows:

". . . Wiring shall be neatly arranged and clamped securely to panels to prevent movement and breaking. Wiring clamps and supports at hinge transition points shall be properly sized to prevent chafing of insulation when the door is opened and closed. Bands used for lacing and tying bundles of wire shall not have metal

clips or sharp edges. No metal clamps shall be used to hold bundles or wires in place. Plastic clamps or loops similar to Burndy "Nylo-clip" type HP or approved equal shall be used. . "

During a shop inspection in October 1977, DLC/QC Vendor Surveillance Group first identified instances where plastic fittings with a self-adhesive base had pulled loose from the panels. Between October 1977 and May 1978, four N&D's were issued to describe this condition in detail in both diesel generator units. The following final dispositions to the N&D's were provided:

"In general, cable clamps used for wiring support were Panduit ABMS-A adhesive backed mounts. These clamps contain a counter-sunk hole which permits the mount to be used with a flat head screw for screw attachment.

Except in places where Vendor has determined to be a high stress point, cable clamps were attached with adhesive backing which is not acceptable. Vendor now proposes to add screw type fastener to Panduit adhesive clamps to provide an installation where the separation between screw fastened clamps will not be greater than 12 inches.

Removal of the Panduit adhesive clamps and replacing them with approved Burndy "Nylo-clip" type HP clamps is not practical at this time. Therefore, Panduit ABMS-A adhesive clamps are acceptable for existing installation, unless otherwise noted in this N&D, provided the clamps are attached with a flat head screw through a tapped hole to provide an installation where separation between screw fastened clamps will not be greater than 12 inches. Where additional clamps were added after the inspection of January 5, 1978, only Burndy "Nylo-clip" clamp type HP shall be used.

Adhesive clamps (without screw attachment) where used between screw fastened type need not be removed; they will provide further support. In providing screw type attachments, it is the Vendor's responsibility to provide panels whose face appearance is not degraded."

The above disposition constitutes the approval of the installation as provided under the specification wording, ". . . Burndy "Nylo-clip" type HP or approved equal. . ." The disposition also permitted, ". . . Adhesive clamps (without screw attachment) where used between screw fastened clamps need not be removed . . ." A Shop inspection conducted in October 1978 verified that adhesive clamps (without screw attachments) were located between screw fastened clamps whose separation did not exceed 12 inches.

Therefore, BVPS-2 maintains that measures were established and conducted to assure that the arrangement and clamping of electrical wiring in the exciter control panels conformed to the specification requirements. In consideration of the above information, BVPS-2 requests this violation (84-03-01) be reconsidered by the NRC.

Notice of Violation:

B 10CFR50, Appendix B, Criterion V requires that activities affecting quality shall be prescribed by documented instructions or procedures or a type appropriate to the circumstances.

Contrary to the above, as of March 12, 1984, Quality Control was performing inspection on electrical cables using a procedure which inaccurately described the acceptance standards.

Response to Violation B:

Inspection Report 40-412/84-03 that was included with the NRC letter to Mr. E. J. Woolever, dated April 16, 1984, determined that the licensee has already taken the necessary corrective actions and, therefore, no written responses to this item is required.

Item of Concern

Extract from the NRC Cover Letter

"Additionally, we are concerned about the increasing number of QC reinspections that are necessary because of contractor initiated clarified/changed design requirements. Many of these reinspections are a direct result of following up on violation of NRC requirements (corrective actions), some of which are discussed in the enclosed inspection report. Also, we understand that there are ongoing efforts to reinspect more than 6,000 supports as the result of design changes made after installation and QC inspection. Our concerns are reflected in the following questions: (1) why have so many changes occurred for supports; (2) are design documents receiving adequate care and attention during preparation and review to ensure that they are unambiguous for field use; and (3) is there enough design detail/criteria in design documents to provide for installation directions and QC inspection criteria sufficient to assure quality? Your response to this letter should also address these questions and provide an evaluation of the root causes of the unusually high number of QC reinspections."

Background

In recognition of the fact that massive changes to piping and pipe supports occurring at the time of plant finalization can be a source of confusion, possible quality degradation, and significant schedule delays, DLC began addressing this issue in 1978.

A series of planned actions were undertaken to preclude the incorporation of designs into the physical plant that would, at the critical plant completion phase, cause major plant rework.

The first step taken, in 1979, was to conduct a combined DLC-SWEC review of existing fluids system designs. The purpose of this review was to assure that the existing fluid system design configuration

incorporated the system operating experience of Unit 1, the Regulatory changes resulting from the TMI incident and Regulatory changes between 1974 (the CP date for BV-2) and 1979.

In 1979, the Project expanded its use of computer analyses to encompass virtually all piping in the plant.

In 1980, the Project introduced its "Green Isometric" Program. The Green Isometric Program consisted of a review of pipe stress analysis and the associated support design provided. Problems identified during this review were resolved prior to construction. Additionally, it was and continues to be anticipated that the Green Isometric Program will reduce the impact of any required changes due to stress reconciliation required for ASME III Code certification.

Concurrent with the above efforts, in 1979 the plant scale model was received on site. This model was used in conjunction with the Green Isometric Program as a design tool to identify and reconcile pipe and support changes prior to their issuance to construction. The model was also used to design routings and locate supports for small bore pipe.

In recognition that, even with the above efforts, some field adjustments of location and details would be necessary, field engineering and design forces were incrementally increased as construction efforts intensified. The detailed changes controlled by the field engineering operation varies by both type and source.

Our specific response to the NRC's questions are as follows:

1. Why have so many changes occurred for supports?

Answer:

Changes to approved support drawings, after release for installation, are caused by a variety of reasons. These may be categorized as follows:

- a) Physical interferences determined during the installation process which were not identified or identifiable on the model or during engineering review, mostly because of installation tolerances.
- b) Other installation problems identified in site nonconformances or construction deficiency reports, vendor engineered supports (e.g. Automatic Sprinkler), and vendor problems identified in shop nonconformances.
- c) Clarifications/data provided to facilitate construction and/or QC inspection. This category also includes nonconformances issued to address QA/QC concerns (both site and vendor shops).

- d) Changes in SWEC/DLC specified engineering criteria and design details because either incorrect criteria or details were specified and were later changed as a result of engineering confirmation or incorporation of state-of-the-art improvements.
  - e) Changes in SWEC/DLC specified engineering criteria and design details as a result of expansion and better definition of code and regulatory requirements.
2. Are design documents receiving adequate care and attention during preparation and review to ensure that they are unambiguous for field use?

Answer:

In accordance with the "Project Training Program" (2BVM-140), SWEC engineers assigned to BVPS-2 are required to participate in

formal, periodic, orientation/indoctrination and continuing education courses to improve activities affecting quality. Specific procedures are followed, both at headquarters and at the site, for the preparation, review and control of engineering documents. Every effort is made to eliminate ambiguity in engineering documents prior to issue. In recognition of the fact that there may still be some engineering information which may be misinterpreted, the "Request for Information Program" (FCP-7) was established in May 1977. QC and Construction, when confronted with a need for clarification/reconciliation of engineering information, are required to use this system prior to installation or inspection.

3. Is there enough design detail criteria in design documents to provide for installation directions and QC inspection criteria sufficient to assure quality?

Answer:

The development of Field Construction Procedures (FCP's) and Inspection Plans (IP's) is closely coupled to the engineering criteria and details provided in specifications, procedures, drawings, etc. FCP's are reviewed by Engineering, and along with engineering documents mentioned above, provide the bases for interpretation of engineering criteria and details by Construction and QC. Generally, IP's have not been reviewed by the Engineers. BVPS-2 will now require the Engineers to review all IP's.

Occasionally engineering criteria and/or details are changed during and after installation/QC inspection due to programs identified above. This was mainly due to the "Fluid System Finalization" and the "Green Isometric" programs. However, BVPS-2 believes these programs have improved overall quality of engineering information. The "Advance Change E&DCR Program" (FCP-36), established in October 1982, has reduced significantly the impact of in-process change.

Both, the NRC (Region 1) and INPO have evaluated the Advance Change E&DCR Program and have commented favorably.

Evaluation at the Root Cause:

The nature of the individual changes identified either internally or by the NRC, prompted the reinspection program. It is the BVPS-2 position that the project must ensure the proper implementation of changed engineering criteria and design details irrespective of the reason for change. In this case, because of the large number of individual pipe supports in the plant, a relatively large number are potential candidates for reinspection.

Summary

In summary, over the past several years, BVPS-2 has taken many positive actions to establish/define specific engineering criteria to facilitate installation and inspection. From the fluid system designs review program initiated in 1979 through the Engineering Confirmation Program (which was presented to the NRC on October 21, 1983), BVPS-2 has taken steps to confirm the adequacy of engineering information to assure consistency in information, to strengthen design interface, and in design control implementation.

As BVPS-2 approaches completion, specific aspects of the previously identified programs may require QC reinspection to assure the program objectives. Furthermore, the project recognizes that further confirmation efforts beyond those discussed that are incumbent in a reinspection program, will be necessary to ensure that installations meet current engineering criteria and licensing commitments. These efforts must be time-phased with construction efforts for maximum effect. BVPS-2 does not consider the reinspection program to be a negative aspect. The reinspection program will further assure all concerned parties that changes, whether resulting from regulatory requirements, state-of-the-art improvements, design finalization, etc. have been properly incorporated into the installed configuration.

DUQUESNE LIGHT COMPANY

SUBSCRIBED AND SWORN TO BEFORE ME THIS  
17th DAY OF May, 1984.

Anita Elaine Reiter  
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC  
ROBINSON TOWNSHIP, ALLEGHENY COUNTY

JS/wjs MY COMMISSION EXPIRES OCTOBER 20, 1986

By E. J. Woolever  
E. J. Woolever  
Vice President

cc: Mr. G. Walton, NRC Resident Inspector  
Mr. M. Licitra, Project Manager  
NRC Document Control Desk

