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MAY 26, 1982

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 1E Inspection Report No. 50-412/82-02

Gentlemen:

This is in response to the items of infraction cited in Inspection Report No. 50-412/82-02 and listed in Appendix A (Notice of Violation) attached to your letter to Mr. E. J. Woolever dated April 21, 1982.

NRC VIOLATION (82-02-01)

10CFR50, Appendix B, Criterion V and ANSI N45.2(6) require that quantitative criteria, such as dimension and tolerances, shall be specified, as appropriate, for determining satisfactory work performance and quality compliance.

Contrary to the above, as of April 1, 1982 drawing No. 12241-BZ-STD-PS-2A-2 for installation of pipe anchor PSA-027 shown on drawing No. 103310-OE failed to include sufficient dimensions to assure adequate weld thickness.

This is a severity Level IV violation (Supplement II)".

Further the report stated:

"The inspector observed that the Stone & Webster Engineering Corporation standard procedure STD-PS-2A-2 specified the weld configurations and sizes. The weld dimensions as described in the standard are such that a weld could be made meeting all the requirements without having an adequate throat or weld metal deposit for structural integrity. The inspector further observed that once a weld was made the effective throat or weld metal deposit could not easily be determined. The failure of the standard to specify quantitative criteria to preclude inadequate weld size is a violation of 10CFR50, Appendix B, Criterion V. (82-02-01)".

RESPONSE

Standard BZ Drawing No. PS-2A is used to describe the weld joint details for connecting trunnions to run pipe. The original issue, PS-2A-1 dated January 9, 1979, contained both an angular range requirement of 60 to 100 degrees between the pipe and trunnion surfaces to be welded and a weld leg length requirement that, "the size of the weld shall equal or exceed the specified size, w, at all points in the connection. Typical cross-sectional views were provided showing the weld joint angle, chamfer width, weld leg length, and weld surface profile.

Infraction 82-02-01 cites BZ Drawing No. PS-2A-2, dated January 11, 1980. In response to 82-02-01, Drawing No. PS-2A-2 will be voided, work performed to its requirements reviewed, and new instructions provided for future fabrications. The potential consequences of work performed to PS-2A-2 include the use of joint angles in excess of 100 deg. and undersized weld leg lengths on the run pipe side of the joint. This latter concern is based on a misunderstanding that this side of the weld is controlled by achieving a flush weld. However, the use of a flush weld criterion is only appropriate when the groove angle is nominally equal to 90 deg. To provide clarification for future work drawing Note 2 will be revised to limit the maximum angle of chamfer to 100 deg. (i.e. $60^{\circ} \geq A \geq 100^{\circ}$) and a reference to Note 3, describing the weld leg length, will be shown on both sides of the joint in each typical cross-section provided in PS-2A. The potential use of excessive joint angles and inadequate weld leg lengths will be prevented in the future by these changes to the PS-2A standard.

NRC VIOLATION (82-02-02)

10CFR50, Appendix B, Criterion X and ANSI N45.2 and N45.2.5 (5.5) require inprocess inspection of joint fit-up prior to start of welding on structural steel. N45.2 further requires that where a sample is used to verify acceptability of a group of items, the sampling procedure shall be based on recognized standard practices and shall provide adequate justification for the sample size and selection process.

Contrary to the above, as of April 1, 1982 inspection of joint fit-ups was not being performed in accordance with a recognized sampling procedure.

This is a Severity Level IV Violation (Supplement II).

Further the report stated:

"The inspector expressed concern that the inspection of welding preparation and fit-up were not performed on all safety-related welds. In response to the inspector's concern the licensee stated that the inspections for fit-ups and welding-prep were carried out on a random sampling basis, and was considered adequate by the licensee to assure the integrity of welds. The inspector, however, observed that the random inspections performed for weld-preps and fit-ups were not based on any established sampling plan, recognized standard practice, and/or a predetermined frequency; also, the licensee could not provide adequate justification for the sample size or selection process.

The inspector further observed that the weld #2-SIS-87-F500 in the Safety Injection System was inspected but had not been accepted because the final weld size was not verifiable by QC due to the lack of weld-prep and fit-up data, and the dimension of land area in the joint.

The method used by the licensee to perform the fit-up inspections does not meet the intent of 10CFR50, Appendix B, Criterion X for the following reasons:

- a. The items selected for fit-up inspection are highlighted with an asterisk on the weld data sheet. This provides the construction personnel advance notice of those that will be inspected and those that will not. This could result in such welds being a non-representative sample. Added attention to quality would be possible for those welds so identified for inspection including assignment of the best fitter(s) to work on such welds.
- b. The method used by Quality Control personnel to select the fit-ups that will be inspected is not based on any approved sampling program. It appears to be based on the decision of that particular person marking the weld data sheet. This method could vary from person to person and does not provide adequate justification for the different variables involved such as different crafts and welding processes involved.

The failure to perform fit-up inspections by recognized standard practices is a violation of 10CFR50, Appendix B, Criterion X. (82-02-02)."

RESPONSE

Because of the extent of the subject affected by this item of Infraction 82-02-02, Beaver Valley Power Station #2 (BVPS #2) requests that this response be considered as an initial response. Further interim or a final response will be transmitted thirty days from the date of this letter.

IMMEDIATE ACTION

A stop work order was issued against the welding of trunnions to pipe by memorandum #2BVSE-60355-CLB/N, dated April 8, 1982. This action was taken for two basic reasons: the insufficient criteria reported by Infraction #82-02-01 and the trunnion weld subject for inspection has not been selected for fit-up inspection.

SHORT TERM ACTION

It is considered necessary to place on record the degree of fit-up verification on the types of weld configurations installed, performed by Quality Control (QC) and Welding Supervision-Staff (WSS) in addition to the verification performed by the Craft Foreman and Craft. In some instances QC and WSS both inspect the same fit-up. In other instances, either one or the other verify the attribute.

As the ASME Section III Pipe Support Attachment Welds (Trunnion Type) were the subject of the original concern, they are described in more detail as follows:

A review indicates that 84 supports were installed. Some of these supports have double trunnion welds resulting in a total of 10 Weld Data Sheets (WDS). The fit-up verification assignments were as follows:

QC	42	40%	98% Combined
WSS	97	93%	
Craft Only	2		2%

COMMENTS

BVPS #2 considers the number of fit-up inspection assignments to be more than adequate. The problem is related to the need for more definitive criteria (see 82-02-01) and instructions to QC, WSS and Craft personnel for this type of weld configuration. These items will be resolved prior to recommencement of the trunnion to pipe welding activity.

In order to establish the actual weld conditions an Ultrasonic Examination program (Procedure DLC/SQC UT-13) has been initiated.

The results of the examination and engineering analysis as of May 17, 1982, are as follows:

Welds Examined	57
Welds Analyzed	29
Welds Accepted to Original Engineering Criteria	22
Welds Subject to Further Evaluation	7

The examination is continuing and the results of the examination and analysis will be made available as required.

ASME SECTION III PIPE BUTT WELDS (Class 1, 2 & 3)

Class 1: Requires 100% QC fit-up verification and 100% Radiography Test (RT). Therefore, no review was performed.

Class 2: Requires random fit-up verification by QC and 100% RT. The WDS of the 675 welds shown on the RT Weld Analysis Report 3/30/82 were reviewed.

Assigned QC	671	-	99%	99% Combined
Assigned WSS	671	-	99%	
Craft Only	4			1%

Inspected QC	675	100%
Inspected WSS	675	
Craft Only	0	0

The four welds not assigned for fit-up verification were actually inspected and so recorded.

Class 3: Requires random fit-up verification by QC with no R/T. The method of selection of the WDS for review was as follows:

61 Isometric Drawings (ISO) were selected from the total of 198 in the drawing log, covering the period July 1976 through February 1982. The ISO's selected contained 450 welds, the 450 WDS obtained had fit-up assignments made by 10 out of the 12 personnel employed for this function by QC and WSS during the period covered.

Assigned QC	428	95%	100% Combined
Assigned WSS	444	98%	
Craft Only	0		

COMMENTS

All 1125 pipe welds reviewed had the fit-up attribute verified by QC/WSS. The 4 welds that were not originally assigned this attribute were required to be examined by RT.

ASME SECTION III PIPE SUPPORT ATTACHMENT WELDS (Excluding Trunnion Type)

Class 1: None of these welds have been fit-up or completed.

Class 2: A similar selection process, by ISO and drawing log, as that used by Class 3 pipe weld selection, was used. This resulted in 67 (32.8%) ISO's being selected from the total of 204. The ISO's selected contained 90 welds. The results obtained for fit-up assignment are as follows:

QC	6	6.5%	87% Combined
WSS	74	82.0%	
Craft Only	12	13.0%	

12 welds of the 190 WDS reviewed, completed.

Class 3: The same ISO's used for Class 3 pipe weld selection were used. The 61 ISO's contained 106 welds. The results obtained for fit-up are as follows:

QC	1	1%	96% Combined
WSS	102	96%	
Craft Only	4		4%

16 welds, of the 106 WDS reviewed, completed.

COMMENTS

This type of weld configuration can be considered as simplistic and in some instances the fit-up gap can be verified visually to some degree at the completed weld stage.

SUMMARY OF SHORT TERM ACTION

The foregoing illustrates the degree of QC/WSS verification applied to the fit-up attribute under ASME III for welds that have been considered to have a structural application and require Weld Data Sheets and Hold Point Assignment. The WDS review has indicated the following:

- a) In certain pipe classes, the QC verification could be reduced, particularly where RT examination is involved;
- b) QC has over-emphasized the "simplicity" aspect of the Pipe Attachment Welds (not Trunnion Type);
- c) The degree of fit-up verification assigned to QC (80.8%) and the verification assigned to QC and WSS (98.7%) combined nullifies:
 - 1) Any adverse effect that may be caused by the lack of "any recognized sampling procedure",
 - 2) The contention that an "unrepresentative sample" was obtained by giving "advance notice";
 - 3) The contention that a variance occurred in the assignment of this caused by the "method varying from person to person";
- d) The summary relating to the Trunnion to Pipe type weld is given in the ASME Section III Pipe Support Attachment Welds (Trunnion Type) discussion on page 4 of this report.

SHORT TERM CORRECTIVE ACTION

- a) The QC (fit-up attribute) assignment for the Pipe Support Attachment Welds (Non-Trunnion) Class 1, 2 and 3 will be increased with particular emphasis on those configurations not allowing any fit-up verification at completion;

- b) On the receipt of revised criteria and appropriate instructions, the QC fit-up attribute assignment on Trunnion/Pipe Welds will be increased to 100% on the basis on a new activity with some complexity until credibility is obtained;
- c) The actions in a) and b) may cause a decrease in QC verification of fit-up for ASME III Class 2 Pipe Welds.

LONG TERM CORRECTIVE ACTION

A more definitive frequency plan for QC attribute assignment will be formalized, possibly based on:

- a) The simplicity or complexity of the configuration;
- b) The degree of visibility of the fit-up condition at completion;
- c) The application of volumetric Non-Destructive Examination (NDE) at final condition;
- d) The relationship between QC assignment and the assignment of fit-up inspections attribute by WSS;
- e) The feedback of unsatisfactory conditions.

This approach is subject to change. The program, when confirmed, will be submitted in a future response.

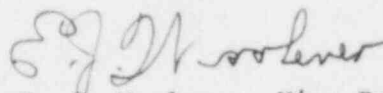
SAFETY IMPLICATION

BVPS #2 considers there is no safety implication directly related to the degree of weld fit-up verification assignment. However, the results of the Trunnion/Pipe attachment weld UT examination may indicate such an implication when evaluation is complete. If this is the situation, the matter will be reported in accordance with the requirements of 10CFR59.55 (e).

GENERAL

BVPS #2 is proceeding with reviews of the fit-up verification of welds related to Pipe Supports, Electrical Cable Tray and Conduit Supports, HVAC Supports and AWS welding. Unless otherwise instructed, the results of the reviews and programs for these activities will be submitted to the Resident Inspector when completed.

Sincerely yours,



E. J. Woolever, Vice President
Nuclear Construction Division

United States Nuclear Regulatory Commission
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SDH/ge

cc: Messrs: Mr. G. Walton, BV-2 NRC Resident Inspector
Ms. E. Doolittle, NRC Project Manager

COMMONWEALTH OF PENNSYLVANIA

COUNTY OF ALLEGHENY

On this 26th day of May, 1982, before me, ALAN B. BANAS, a Notary Public in and for said Commonwealth and County personally appeared E. J. Woolever who, being duly sworn, disposed, and said that (1) he is Vice President of Duquesne Light Company, (2) he is duly authorized to execute and file the foregoing Report on behalf of said Company, and (3) the statements set forth in this Report are true and correct to the best of his knowledge, information, and belief.

WITNESS my hand and seal the day and year first above written.

ALAN B. BANAS, NOTARY PUBLIC
ROBINSON TWP., ALLEGHENY COUNTY
MY COMMISSION EXPIRES APRIL 12, 1986
Member, Pennsylvania Association of Notaries

