Duquesne Light
435 Sixth Avenue
Pittsburgh, Pennsylvania
15219
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October 4, 1979

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ACTION REQ. YES ☐ NO ☐
B.:
ANSWER DATE
FILE NRC Corres. IEB 79-14

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

ATTENTION: MR. BOYCE H. GRIER, DIRECTOR

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
Response to IE Bulletin 79-14

Gentlemen:

The following information is provided in response to I&E Bulletin 79-14, issued July 2, 1979, revised July 18, 1979 and supplemented on August 15, 1979 and September 7, 1979 as it applies to Beaver Valley Power Station - Unit No. 2. The item numbers listed below correspond to numbered items in IE Bulletin 79-14.

Item (1)

No significant portions of safety-related piping systems have been erected to date at Beaver Valley Power Station - Unit No. 2. Therefore, the inspections/field verification requested by NRC IE Bulletin 79-14 cannot be implemented at this time. The following information, however, is provided as requested.

All safety-related piping systems at BVPS-2 are designed, fabricated, and erected to meet the requirements of the 1971 Edition and addenda through the Winter 1972 Addendum of the ASME III Code. As required by Section NA-3252 of the Code, these piping systems are designed in accordance with a Design Specification. This Design Specification - Piping, Engineering, and Design (Spec. No. 2BVS-939), Revision I, dated July 10, 1974, includes all appropriate design requirements to assure that these safety-related piping systems are designed to meet the requirements of the Code. In conjunction with the Design Specification, the following input documents are used to provide specific design data in the seismic analysis as specified in 2BVS-939 for safety-related piping systems.

Item #3

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a. RP/RB series drawings: Provide piping geometry, pipe support and valve locations and orientations, line designation numbers, etc.

b. Line Designation Tables: Provide line numbers and the associated pipe properties, insulation type and thickness, etc.

c. RC and RS series drawings: Structural steel and concrete drawings used in pipe support design.

d. Amplified Response Spectra and Seismic Displacements of Buildings.

e. Vendor Drawings and Seismic Reports for Valves: Provide valve and operator weights, center of gravity, orientation, etc.

f. Piping and Pipe Support Specifications:

1. 2BVS-58, Specification for Shop Fabricated Pipe, Revision 1, dated December 31, 1973.

2. 2BVS-59, Specification for the Design and Fabrication of Power Plant Pipe Supports, Revision I, dated January 31, 1977.

3. 2BVS-920, Specification for the Field Fabrication and Erection of Piping, Revision 3, dated August 22, 1978.

g. Vendor Component Drawings/Date: Provides component geometry, acceptable nozzle loadings, etc.

The results of the final pipe stress analysis calculated using the above are documented in the following documents:

a. AX series documents: Pipe stress analysis summary sheets

b. RZ/BZ series drawings: Pipe support loading summaries and support detail drawings

The stress analysis and the input documents used in the analyses are based on approved documents/procedures which are governed by Stone & Webster Engineering Assurance Procedures and technical guidelines. Allowable construction tolerances, where appropriate, are specified in the appropriate drawings and specifications.

The Quality Assurance program in effect at the BVPS-2 jobsite assures that all safety-related piping and pipe supports are installed in accordance with approved documents which were used as a basis for the final stress analyses. After installation/fabrication, an inspection program (which includes the Authorized Nuclear Inspector - ANI) assures conformance to approved documents. All deviations identified during fabrication, installation, and verification inspection phases are reported to the Engineers through Engineering and Design Coordination Reports or Nonconformance and Disposition Reports for resolution. Changes resulting from the disposition of these reports are included in a revised stress analysis of the piping system, as appropriate, and are included in the final as-built drawings.

Items 2, 3, and 4

As discussed under Item 1, inspection/field verification of safety-related piping systems at BVPS-2 is premature; therefore, the action requested under items 2, 3, and 4 of NRC IE Bulletin 79-14 are not applicable to BVPS-2.

Should you have any additional questions regarding this matter, please contact us.

DUQUESNE LIGHT COMPANY

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

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STONE & WEBSTER ENGI CORPORATION

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DUQUESNE LIGHT CO.
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Mr. H. A. Van Wassen
Project Manager
Duquesne Light Company
435 Sixth Avenue
Pittsburgh, PA. 15219

October 1, 1979

J.O.No. 12241
2DLS-9380
DW7909280021

CONTROL LEVEL 3

Dear Sir:

BEAVER VALLEY POWER STATION - UNIT NO. 2
J.O.NO. 12241-O.F.E.NO. 10080-C.O.NO. 6289
NRC IE BULLETIN NO. 79-14
SEISMIC ANALYSIS FOR AS-BUILT SAFETY RELATED PIPING SYSTEMS

The following is our recommended response to NRC Bulletin 79-14, issued July 2, 1979, revised July 18, 1979, and supplemented August 15, 1979, and September 7, 1979, as it applies to Beaver Valley Power Station - Unit No. 2. The item numbers listed below are referred to similarly numbered items in NRC IE Bulletin 79-14.

Item (1)

No significant portions of safety-related piping systems have been erected to date at Beaver Valley Power Station - Unit No. 2. Therefore, the inspections/field verification requested by NRC IE Bulletin 79-14 cannot be implemented at this time. The following information, however, is provided as requested.

All safety-related piping systems at BVPS-2 are designed, fabricated, and erected to meet the requirements of the 1971 Edition and addenda through the Winter 1972 Addendum of the ASME III Code. As required by Section NA-3252 of the Code, these piping systems are designed in accordance with a Design Specification. This Design Specification:- Piping, Engineering, and Design (Spec. No. 2BVS-939), Revision I, dated July 10, 1974, includes all appropriate design requirements to assure that these safety-related piping systems are designed to meet the requirements of the Code. In conjunction with the Design Specification, the following input documents are used to provide specific design data in the seismic analysis as specified in 2BVS-939 for safety-related piping systems.

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Stone & Webster
Engineering Corporation
B.V.P.S. Unit 2

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(which includes the Authorized Nuclear Inspector - ANI) assures conformance to approved documents. All deviations identified during fabrication, installation, and verification inspection phases are reported to the Engineers through Engineering and Design Coordination Reports or Nonconformance and Disposition Reports for resolution. Changes resulting from the disposition of these reports are included in a revised stress analysis of the piping system, as appropriate, and are included in the final as-built drawings.

Items 2, 3, and 4

As discussed under Item 1, inspection/field verification of safety-related piping systems at BVPS-2 is premature; therefore, the action requested under items 2, 3, and 4 of NRC IE Bulletin 79-14 are not applicable to BVPS-2.

Please note that a written response to this bulletin is requested by the NRC. If you should have any further questions regarding this matter, please contact us.

Very truly yours,

W. H. Bohlke
Project Engineer

JV:EC

ENCLOSURE 1

SSINS: 6820
Accession No.: 7908220109

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

IE Bulletin No. 79-14
Supplement 2
Date: September 7, 1979

SEISMIC ANALYSIS FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

Description of Circumstances:

IE Bulletin No. 79-14 was issued on July 2, revised on July 18, and first supplemented on August 15, 1979. The bulletin requested licensees to take certain actions to verify that seismic analyses are applicable to as-built plants. Supplement 2 provides the following additional guidance with regard to implementation of the bulletin requirements:

Nonconformances

One way of satisfying the requirements of the bulletin is to inspect safety-related piping systems against the specific revisions of drawings which were used as input to the seismic analysis. Some architect-engineers (A-E) however, are recommending that their customers inspect these systems against the latest revisions of the drawings and mark them as necessary to define the as-built configuration of the systems. These drawings are then returned to the AE's offices for comparison by the analyst to the seismic analysis input. For licensees taking this approach, the seismic analyst will be the person who will identify nonconformances.

The first supplement to the bulletin provided guidance with regard to evaluation of nonconformances. That guidance is appropriate for licensees inspecting against later drawings. The licensee should assure that he is promptly notified when the AE identifies a nonconformance, that the initial engineering judgment is completed in two days and that the analytical engineering evaluation is completed in 30 days. If either the engineering judgement or the analytical engineering evaluation indicates that system operability is in jeopardy, the licensee is expected to meet the applicable technical specification action statement.

Visual Approximations

Some licensees are visually estimating pipe lengths and other inspection elements, and have not documented which data have been obtained in that way. Visual estimation of dimensions is not encouraged for most measurements; however, where visual estimates are used, the accuracy of estimation must be within tolerance requirements. Further, in documenting the data, the licensee must specifically identify those data that were visually estimated.

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Item # 5

Thermal Insulation

In many areas, thermal insulation interferes with inspection of pipe support details, i.e. attachment welds, saddles, support configuration, etc. In some areas, the presence of thermal insulation may result in unacceptably large uncertainties for determination of the location of pipe supports.

Where thermal insulation obstructs inspection of support details, the insulation should be removed for inspection of a minimum of 10% of the obstructed pipe supports in both Item 2 and 3 inspections. In the Item 3 response, the licensee should include a schedule for inspecting the remaining supports.

Where necessary to determine the location of pipe supports to an accuracy within design tolerances, thermal insulation must be removed.

Clearances

For exposed attachments and penetrations, licensees are expected to measure or estimate clearances between piping and supports, integral piping attachments (e.g. lugs and gussets) and supports, and piping and penetrations. Licensees are not expected to do any disassembly to measure clearances.

Loose Bolts

Loose anchor bolts are not covered by this bulletin, but are covered by IE Bulletin No. 79-02. Any loose anchor bolts identified during actions taken for this bulletin should be dispositioned under the requirements of Bulletin No. 79-02.

Other loose bolts are to be treated as nonconformances if they invalidate the seismic analysis; however, torquing of bolts is not required.

Difficult Access

Areas where inspections are required by the Bulletin but are considered impractical even with the reactor shutdown, should be addressed on a case by case basis. Information concerning the burden of performing the inspection and the safety consequence of not performing the inspection should be documented by the licensee and forwarded for staff review.

Schedule

The schedule for the action and reporting requirements given in the Bulletin as originally issued remains unchanged.

ENCLOSURE 1

Action to be taken by Licensees and Permit Holders:

All power reactor facility licensees and construction permit holders are requested to verify, unless verified to an equivalent degree within the last 12 months, that the seismic analysis applies to the actual configuration of safety-related piping systems. The safety related piping includes Seismic Category I systems as defined by Regulatory Guide 1.29, "Seismic Design Classification" Revision 1, dated August 1, 1973 or as defined in the applicable FSAR. The action items that follow apply to all safety related piping 2½-inches in diameter and greater and to seismic Category I piping, regardless of size which was dynamically analyzed by computer. For older plants, where Seismic Category I requirements did not exist at the time of licensing, it must be shown that the actual configuration of ~~these~~ safety-related systems, utilizing piping 2½ inches in diameter and greater, meets design requirements.

Specifically, each licensee is requested to:

1. Identify inspection elements to be used in verifying that the seismic analysis input information conforms to the actual configuration of safety-related systems. For each safetyrelated system, submit a list of design documents, including title, identification number, revision, and date, which were sources of input information for the seismic analyses. Also submit a description of the seismic analysis input information which is contained in each document. Identify systems or portions of systems which are planned to be inspected during each sequential inspection identified in Items 2 and 3. Submit all of this information within 30 days of the date of this bulletin.

2. For portions of systems which are normally accessible*, inspect one system in each set of redundant systems and all nonredundant systems for conformance to the seismic analysis input information set forth in design documents. Include in the inspection: pipe run geometry; support and restraint design, locations, function and clearance (including floor and wall penetration); embedments (excluding those covered in IE Bulletin 7902); pipe attachments; and valve and valve operator locations and weights (excluding those covered in IE Bulletin 7904). Within 60 days of the date of this bulletin, submit a description of the results of this inspection. Where nonconformances are found which affect operability of any system, the licensee will expedite completion of the inspection described in Item 3.

*Normally accessible refers to those areas of the plant which can be entered during reactor operation.

ENCLOSURE 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

SEISMIC ANALYSIS FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

Discription of Circumstances:

IE Bulletin No. 79-14 was issued on July 2, 1979 and revised on July 18, 1979. The bulletin requested licensees to take certain actions to verify that seismic analyses are applicable to as-built plants. This supplement to the bulletin provides additional guidance and definition of Action Items 2, 3, and 4.

To comply with the requests in IE Bulletin 79-14, it will be necessary for licensees to do the following:

2. Inspect Part of the Accessible Piping

For each system selected by the licensee in accordance with Item 2 of the Bulletin, the licensee is expected to verify by physical inspection, to the extent practicable, that the inspection elements meet the acceptance criteria. In performing these inspectons, the licensee is expected to use measuring techniques of sufficient accuracy to demonstrate that acceptance criteria are met. Where inspection elements important to the seismic analysis cannot be viewed because of thermal insulation or location of the piping, the licensee is expected to remove thermal insulation or provide access. Where physical inspection is not practicable, e.g., for valve weights and materials of construction, the license is expected to verify conformance by inspection of quality assurance records. If a nonconformance is found, the licensee is expected in accordance with Item 4 of the Bulletin to perform an evaluation of the significance of the nonconformance as rapidly as possible to determine whether or not the operability of the system might be jeopardized during a safe shutdown earthquake as defined in the Regulations. This evaluation is expected to be done in two phases involving an initial engineering judgement (within 2 days), followed by an analytical engineering evaluation (within 30 days). Where either phase of the evaluation shows that system operability is in jeopardy, the licensee is expected to meet the applicable technical specification action statement and complete the inspections required by Item 2 and 3 of the Bulletin as soon as possible. The licensee must report the results of these inspections in accordance with the requirements for content and schedule as given in Item 2 and 3 of the Bulletin.

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Item # 6

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3. Inspect Remaining Piping

The licensee is expected to inspect, as in Item 2 above, the remaining safety-related piping systems which were seismically analyzed and to report the results in accordance with the requirements for content and schedule as given in Item 3 of the Bulletin.

4A. Evaluate Noncomformances

With regard to Item 3A for the Bulletin, the licensee is expected to include in the initial engineering judgement his justification for continued reactor operation. For the analytical engineering evaluation, the licensee is expected to perform the evaluation by using the same analytical technique used in the seismic analysis or by an alternate, less complex technique provided that the licensee can show that it is conservative.

If either part of the evaluation shows that the system may not perform its intended function during a design basis earthquake, the licensee must promptly comply with applicable action statements and reporting requirements in the Technical Specifications.

4B. Submit Nonconformance Evaluations

The licensee is expected to submit evaluations of all nonconformances and, where the licensee concludes that the seismic analysis may not be conservative, submit schedules for reanalysis in accordance with Item 4B of the Bulletin or correct the noncomformances.

4C. Correct Nonconformances

If the licensee elects to correct nonconformances, the licensee is expected to submit schedules and work descriptions in accordance with Item 4C of the Bulletin.

4D. Improve Quality Assurance

If noncomformances are identified, the licensee is expected to evaluate and improve quality assurance procedures to assure that future modifications are handled efficiently. In accordance with Item 4D of the Bulletin, the licensee is expected to revise design documents and seismic analyses in a timely manner.

The schedule for the action and reporting requirements given in the Bulletin as originally issued remains unchanged.

Approved by GAO, B180225 (R0072), clearance expires July 31, 1980. Approval was given under a blanket clearance specifically for identified generic problems.

ENCLOSURE 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

IE Bulletin No. 79-14
Date: July 2, 1979

SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

Description of Circumstances:

Recently two issues were identified which can cause seismic analysis of safety-related piping systems to yield nonconservative results. One issue involved algebraic summation of loads in some seismic analyses. This was addressed in show cause orders for Beaver Valley, Fitzpatrick, Maine Yankee and Surry. It was also addressed in IE Bulletin 79-07 which was sent to all power reactor licensees.

The other issue involves the accuracy of the information input for seismic analyses. In this regard, several potentially unconservative factors were discovered and subsequently addressed in IE Bulletin 79-02 (pipe supports) and 79-04 (valve weights). During resolution of these concerns, inspection by IE and by licensees of the as-built configuration of several piping systems revealed a number of nonconformances to design documents which could potentially affect the validity of seismic analyses. Nonconformances are identified in Appendix A to this bulletin. Because apparently significant nonconformances to design documents have occurred in a number of plants, this issue is generic.

The staff has determined, where design specifications and drawings are used to obtain input information for seismic analysis of safety-related piping systems, that it is essential for these documents to reflect as-built configurations. Where subsequent use, damage or modifications affect the condition or configuration of safety-related piping systems as described in documents from which seismic analysis input information was obtained, the licensee must consider the need to re-evaluate the seismic analyses to consider the as-built configuration.

Action to be taken by Licensees and Permit Holders:

All power reactor facility licensees and construction permit holders are requested to verify, unless verified to an equivalent degree within the last 12 months, that the seismic analysis applies to the actual configuration of safety-related piping systems. The safety related piping includes Seismic Category I systems as defined by Regulatory Guide 1.29, "Seismic

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Design Classification" Revision 1, dated August 1, 1973 or as defined in the applicable FSAR. For older plants, where Seismic Category I requirements did not exist at the time of licensing, it must be shown that the actual configuration of these safety-related systems meets design requirements.

Specifically, each licensee is requested to:

1. Identify inspection elements to be used in verifying that the seismic analysis input information conforms to the actual configuration of safety-related systems. For each safety-related system, submit a list of design documents, including title, identification number, revision, and date, which were sources of input information for the seismic analyses. Also submit a description of the seismic analysis input information which is contained in each document. Identify systems or portions of systems which are planned to be inspected during each sequential inspection identified in Items 2 and 3. Submit all of this information within 30 days of the date of this bulletin.

2. For portions of systems which are normally accessible*, inspect one system in each set of redundant systems and all nonredundant systems for conformance to the seismic analysis input information set forth in design documents. Include in the inspection: pipe run geometry; support and restraint design, locations, function and clearance (including floor and wall penetration); embedments (excluding those covered in IE Bulletin 79-02); pipe attachments; and valve and valve operator locations and weights (excluding those covered in IE Bulletin 79-04). Within 60 days of the date of this bulletin, submit a description of the results of this inspection. Where nonconformances are found which affect operability of any system, the licensee will expedite completion of the inspection described in Item 3.

*Normally accessible refers to those areas of the plant which can be entered during reactor operation.

3. In accordance with Item 2, inspect all other normally accessible safety-related systems and all normally inaccessible safety-related systems. Within 120 days of the date of this bulletin, submit a description of the results of this inspection.

4. If nonconformances are identified:

   A. Evaluate the effect of the nonconformance upon system operability under specified earthquake loadings and comply with applicable action statements in your technical specifications including prompt reporting.

   B. Submit an evaluation of identified nonconformances on the validity of piping and support analyses as described in the Final Safety Analysis Report (FSAR) or other NRC approved documents. Where you determine that reanalysis is necessary, submit your schedule for: (i) completing the reanalysis, (ii) comparisons of the results to FSAR or other NRC approved acceptance criteria and (iii) submitting descriptions of the results of reanalysis.

   C. In lieu of B, submit a schedule for correcting nonconforming systems so that they conform to the design documents. Also submit a description of the work required to establish conformance.

   D. Revise documents to reflect the as-built conditions in plant, and describe measures which are in effect which provide assurance that future modifications of piping systems, including their supports, will be reflected in a timely manner in design documents and the seismic analysis.

Facilities holding a construction permit shall inspect safety-related systems in accordance with Items 2 and 3 and report the results within 120 days.

Reports shall be submitted to the Regional Director with copies to the Director of the Office of Inspection and Enforcement and the Director of the Division of Operating Reactors, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

Approved by GAO (R0072); clearance expires 7/31/80. Approval was given under a blanket clearance specifically for generic problems.

APPENDIX A

PLANTS WITH SIGNIFICANT DIFFERENCES BETWEEN ORIGINAL DESIGN AND AS-BUILT CONDITION OF PIPING SYSTEMS

Plant	Difference	Remarks
Surry 1	Mislocated supports. Wrong Support Type. Different Pipe Run Geometry.	As built condition caused majority of pipe overstress problems, not algebraic summation.
Beaver Valley	Not specifically identified. Licensee reported "as-built conditions differ significantly from orginal design."	As built condition resulted in both pipe and support overstress.
Fitzpatrick	IE inspection identified differences similar to Surry.	Licensee is using as built configuration for reanalysis.
Pilgrim	Snubber sizing wrong. Snubber pipe attachment welds and snubber support assembly nonconformances.	Plant shutdown to restore original design condition.
Brunswick 1 and 2	Pipe supports undersize.	Both units shutdown to restore original design condition.
Ginna	Pipe supports not built to original design.	Supports were repaired during refueling outage.
St. Lucie	Missing seismic supports. Supports on wrong piping.	Install corrected supports before start up from refueling.

APPENDIX A

PLANTS WITH SIGNIFICANT DIFFERENCES BETWEEN ORIGINAL DESIGN AND AS-BUILT CONDITION OF PIPING SYSTEMS

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St. Lucie	Missing seismic supports. Supports on wrong piping.	Install corrected supports before start up from refueling.