

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-286/84-04

Docket No. 50-286

License No. DPR-64 Priority - Category C

Licensee: Power Authority State of New York
Indian Point 3 Nuclear Power Plant
Buchanan, New York 10511

Facility Name: Indian Point 3

Inspection At: Buchanan, New York

Inspection Conducted: February 27 - March 2, 1984

Inspector: Lewis Mattow / Sr
A. A. Varela, Lead Reactor Engineer

6/8/84
date

Lewis Mattow / Sr
K. A. Manoly, Reactor Engineer

6/8/84
date

M. R. Nitzel, EG&G Idaho, Inc.
R. F. Lippet, EG&G Idaho, Inc.

Approved by: Jacques Durr
J. P. Durr,
Chief Materials and Processes Section, EPB

6/9/84
date

Inspection Summary: Inspection on February 27-March 2, 1984 (Report Number 50-286/84-04).

Areas Inspected: Special, announced inspection by two region-based inspectors and two NRC contractor personnel at Buchanan, New York, of licensee actions in response to the NRC/IE bulletins 79-02 pipe support base plate designs using expansion anchor bolts, 79-14 seismic analyses for as-built safety related piping systems, 79-07 seismic stress analysis of safety related piping and 79-04 incorrect weights for Velan Corporation swing check valves. This included verification of actions under taken and work performed in modifications and repairs precipitated by these bulletins. The inspection involved 102 inspector-hours at the plant site and 30 inspector hours in in-office review.

Results: One violation was identified.

Details

1. Persons Contacted

Power Authority State of New York (PA)

- * J. Cirilli, QA Superintendent
- * J. C. Brons, Resident Manager
- * W. D. Hamlin, Assistant to Resident Manager
- * L. Kelly, Performance and Reliability Supervision
- * S. Munoz, Technical Services Superintendent
- * H. Robinson, QA Engineer
- * J. E. Russell, Superintendent of Power

United Engineers and Constructors (UE&C)

- * R. Barton, Project Manager
- * F. Rigamonti, Chief Engineer (telephone contact 3/6/84)

USNRC

- * L. H. Bettenhausen, Region I
- * T. J. Kenny, Senior Resident Inspector
- * L. W. Rossbach, Resident Inspector
- * M. E. Nitzel, NRC Contractor/E.G.&G. Idaho Inc.
- * R. F. Lippert, NRC Contractor/E.G.&G. Idaho Inc.

2. Inspection Purpose and Scope

The purpose of this inspection was to review with cognizant and responsible licensee and A-E representatives at the plant site the completeness of their responses to NRC/IE Bulletins.

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|-------|---|
| 79-02 | Pipe support base plates using expansion anchor bolts |
| 79-07 | Seismic stress analysis of safety related piping |
| 79-14 | Seismic analysis for as-built safety related piping systems |
| 79-04 | Incorrect weights for swing check valves manufactures by Velan Engineering Corporation. |

The scope of the inspection included a review of engineering design and quality assurance documentation relating to the design, testing, inspection and the modifications and repairs satisfying requirements and licensee commitments with respect to the bulletins.

Subsequent to the plant inspection a review was performed of additional information requested at the exit meeting and detailed in subsequent telephone conversations with the licensee and his A-E. The information received was evaluated and is addressed in paragraph 6 of this report.

3. Review of Licensee Responses

The licensee's formal responses to NRC/IE Bulletins 79-02, 79-07 and 79-14 were reviewed. Additional information referred to but not provided in the formal responses, pertaining to specific activities undertaken in response to the bulletins such as engineering design calculations, inspection, testing, modification work performance and the QA control of these activities were also reviewed and discussed during the inspection. Pipe support calculation packages relating to IEBs 79-02 and 79-14 were included in the inspection at the plant site. Additional documents and six piping field walkdown packages pertaining to IEB 79-14 were also reviewed.

4. Record Review of Pipe Hanger/Support Engineering Modification Packages and Review of Design Calculations

The inspectors selected for in-depth review and concentration of their efforts on the engineering design of pipe hanger/support modification work packages in the safety service water, auxiliary feed water, safety injection and boiler feed water systems. Their review included eleven design packages relating to IEB 79-02. Additional documents pertaining to IEB 79-14 were also reviewed. Due to the interrelated nature of these bulletins, the effects of IEB 79-07 were also assessed during the review of the documentation and the design calculations. The inspectors considered in their assessment of the above the Design Guide Lines identified in correspondence between the licensee and United Engineers and Constructors, dated June 18, 1979 and related attachments on design criteria and calculation methods.

The following significant items of concern resulted from the above review. These were identified at the exit meeting.

1. IEB 79-02 requests that a description of the analytical basis used to account for base plate flexibility be included in licensee's submittals. The licensee submitted the procedures used; however, the inspectors were not able to review the analytical basis for the prying factor and moment reduction factor referred to in UE&C Power Discipline Technical Bulletin 7B, dated May 2, 1979. Additional reports or written documentation describing the derivation of the above factors were requested.
2. Concrete expansion bolt load calculations required by IEB 79-02 are based upon piping support loads that in some cases were determined by computerized analyses. The inspector's review of a limited sample of computer analyses indicates that a wide mass point spacing was used in several areas. In order to verify that conservative support loads were obtained from dynamic analyses, the procedures used in 1979 regarding analytical techniques was requested in the following areas:

- a. Determination of mass point spacing.
 - b. Determination of cut-off frequency.
 - c. Determination of the number of modes to be included in load and stress calculations
 - d. Methods of evaluation for DBE loading.
4. Subsequent to the exit meeting, documentation relating to the above items was redefined and again requested in telephone discussions with the licensee and his A-E. The information received from the licensee on March 27, 1984 was evaluated and further discussed with the licensee and his A-E. From the above the inspectors concluded that the A-E had no procedure for addressing the seismic analysis in their response to NRC/IE Bu 79-07. Further, the inspection has disclosed that the system modelling for seismic analysis was inadequate and after remodelling the piping loads increased in some cases by as much as 75% or more. The uncontrolled data used in this effort was the same as that used in 1972. This is an inadequate response to the 1979 bulletin. The failure to provide procedures for safety related activities is a violation of 10CFR50, Appendix B, Criterion V.

5. Verification Walkdown Inspection

A physical inspection of portions of plant systems selected by the inspectors was conducted. The purpose of this walkdown was to verify samples of piping systems and supports for conformance to as built conditions as described in the licensee's engineering and quality assurance records. The inspectors also verified repairs or modifications to piping supports and/or base plates required by the subject bulletins. The following piping segments and supports were chosen for field verification and related documentation was reviewed as described in paragraph number 4. As indicated in the following tabulation not all those piping segments and/or supports chosen for review were physically verified. A sufficient sample was included in the walkdown to develop confidence that the modifications had in fact been completed as represented in the records. It should also be noted that the walkdown inspection included piping segments from one or more separate pipe line numbers and/or analyses problem numbers.

Piping Segments and Supports Reviewed and Verified

<u>Line #</u>	<u>Prob. #</u>	<u>System</u>	<u>Support</u>	<u>Location</u>	<u>Walked</u>
408	417	SWN	SWN-H&R-526-U	Pipe Trench Area	No
1096	S.T.	SWN	SWN-H&R-1096-4A-U	D.G. Bldg.	Yes
1096	S.T.	SWN	SWN-H&R-1096-3-U	D.G. Bldg.	No
406	440	SWN	SWN-H-406-6-V	Pipe Trench	Yes
1071	475	AFW	CT-H-1071-7-S	A.F. Pmp Rm.	Yes
1004	S.T.	AFW	BFD-R-1004-8-R	A.F. PMP RM.	Yes
550	449	SI	SI-R-550-2	PAB	Yes
277	451	SI	SI-H-277-3-S	PAB	No
56	449	SI	SI-H&R-56-8-U	PAB	Yes
1005	S.T.	BFD	BFD-H-1005-1B-R	PAB	No
1001	S.T.	BFD	BFD-R-1001-1B-R	PAB	Yes

NOTE: SWN = Service Water (Nuclear)
 BFD = Boiler Feedwater
 SI = Safety Injection
 AFW = Auxiliary Feedwater
 PAB = Primary Auxiliary Building
 S. T. = Static Span Table

No violations were identified.

b. Review of Quality Assurance Records Related to Inspection, Testing and Modifications Required by NRC/IE Bulletins

The following licensee QA surveillance/audit reports were reviewed by the inspectors.

- Bulletin 79-02: Torque v.s. Pretension Test for Hilti Kwik-Bolt concrete expansion Anchors/Surveillance Report No. 9-22, dated October 23, 1979 of Hilti Technical Services
- Bulletin 79-14: Piping as-built verification/SR-9-12, dated July 1, 1979
- Bulletin 79-07: Pipe Stress Reanalysis/SR-38-HE, dated August 30, 1979 of UE&C Engineering Pipe Stress Reanalysis
- Bulletin 79-14: As-built drawing verification/SR-9-27, dated October 23, 1979
- Bulletin 79-07: (UE&C Internal Audit), Piping System Reanalysis/PS-6, dated June 28, 1979
- Same/PS-8, dated August 31, 1979

- Bulletin 79-07: (UE&C Internal Audit), Piping System Reanalysis/PS-12, dated January 28, 1981

The NRC inspector observed from his review and evaluation that effective follow-up actions were taken in response to audit findings identified in the above. The corrective actions were verified in subsequent verification audits which noted the identified problem or finding and its satisfactory close out. Although not all audits were observed to have been guided by a check list the requirements of the respective NRC/IEBs appear adequately identified.

No violations were identified.

7. Review of Quality Control Inspection Records of Modified Pipe Hangers/Restraints

Quality control inspection records of as-built and modified pipe hangers/restraints identified in the NRC verification walkdown inspection tabulated in paragraph #5 were reviewed. The requirements of inspection and documentation of the attributes verified by QC were observed to conform to criteria extracted from the following quality control and work procedures:

- AP-9 Work requests
- AP-12 Modifications
- WQA-4-0-17 Inspection Procedure hangers, supports and restraints
- MOD-79-3-084 General Piping Support Modification Procedure
- 3-CM-GEN-3 Base Plate and Anchor Bolt Inspection for Concrete Mounted Hangers

The QC inspection records were observed to provide detailed verification and sign off of each accomplished work step for items identified in each modification request. Specific sign-off such as material identification and certification, torque values, wrench calibration, anchor bolt size and length and weld data check list are contained in the QC inspection documentation reviewed by the NRC inspector.

No violations were identified.

8. Review of Licensee Response to IEB 79-04

The inspector reviewed licensee records and correspondence with regard to IEB 79-04. The records indicate the piping analysis calculations were rerun to reflect the actual valve weights. Reanalyses of valve weights in excess of 10% were conducted as part of the licensee response to IEB 79-07. Their records disclosed that the pipe support and piping penetration associated with one valve with additional load imposed by a 13% increase in weight resulted in piping stress levels not significantly

changed from the original calculations. The inspector concludes the licensee satisfactorily responded to IEB 79-04, that increased valve weights do not adversely affect piping stress levels significantly from the original calculations.

9. Exit Interview

The NRC inspection team met with licensee and A-E representatives (denoted in paragraph 1) at the conclusion of the inspection at the Indian Point #3 plant. The inspectors summarized the findings of the inspection. Additional information as identified in paragraph #4 was requested at this meeting.