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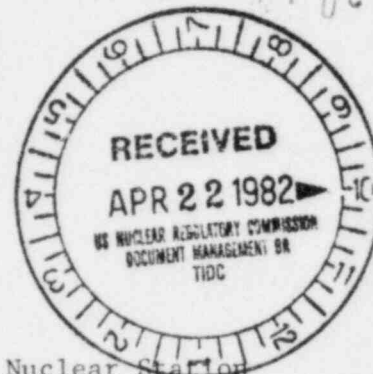
NUCLEAR PRODUCTION DEPARTMENT

January 15, 1982

Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N. W., Suite 3100
Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Director

Dear Mr. O'Reilly:



SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
File 0262/0472/L-860.0/L-401.0
Status of Evaluation of IE Bulletin 79-14
Ref: AECM-79/122 dated October 31, 1979
and AECM-81/212 dated August 11, 1981
AECM-81/474

Because of our construction completion status at the time of issuance of IEB 79-14, Seismic Analysis for As-Built Safety Related Piping Systems, we were able to incorporate many of the Bulletin's suggested corrective actions into our procedures for initial installation and inspection. All accepted piping system components for computer analyzed category 1 systems have been inspected to the revised construction program requirements which meet IE Bulletin 79-14 inspection element requirements. As new supports are installed they are tracked individually and by system to assure inspection and acceptance to the program requirements. This final acceptance review includes a check to assure that the inspections were performed to the latest drawings. Discrepancies to the drawing requirements are documented in accordance with the existing non-conformance control program and are either reworked to drawing requirements or routed to our A-E Project Engineering for resolution which includes incorporation into the stress analysis as required.

At the time of turnover of computer analyzed category 1 systems from our A-E's control to MP&L's control, a final review is performed to assure that all components have been inspected and accepted. Incomplete acceptance at the time of turnover is documented and tracked until completed to program requirements.

In our letter AECM-81/212 dated August 11, 1981, regarding IE Bulletin 79-14 Seismic Analysis for As-Built Safety Related Piping Systems, we indicated that we intended to employ a sampling approach for reinspection to comply with IE Bulletin 79-14. Via our sampling approach we intend to demonstrate that differences between as-built and as-designed safety-related piping are of negligible safety consequence.

In addition to the normal piping and hanger installation inspection, and acceptance program (Attachment No. 1) used for all safety related piping system components, seven systems representing approximately 25% of the total computer analyzed category 1 piping were chosen to be reinspected to assure

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that the existing program was satisfying all IE Bulletin 79-14 requirements. The seven systems chosen as the sample are those safety-related systems determined to have significant accident mitigation capabilities while also being representative of a wide range of operating temperatures, operating pressures, and seismic requirements. These seven systems are being reinspected to the IE Bulletin 79-14 Walkdown Inspection program, GGNS Procedure 9645-SG-1, Rev. 3.

We have completed our walkdown and analysis of data of the sample systems. The results of the sample walkdowns demonstrate an acceptable level of confidence that the normal piping and hanger installation, inspection, and acceptance program is working and meets IE Bulletin 79-14 requirements. Although several items identified during the evaluation require corrective action, they are minor and insignificant to the safe operation of the plant. A list of all items requiring rework or re-analysis for each of the seven (7) systems is included for your review in Attachment No. 2.

In order to ensure completion of all outstanding items, a punch list of open items has been generated for each system. Most of the items are open due to on-going construction, the major items being, portions of mainstream and recirculation system piping within GE's scope of supply (which were inaccessible due to "hot ops" testing), installation of penetration closures, installation of insulation, etc. These items will be inspected and evaluated in a timely manner prior to fuel load.

Subsequent to our submittal of the referenced interim response, your Mr. William Ang visited the GGNS jobsite to review our implementation program to assure compliance with the bulletin. During his visit Mr. Ang requested additional information to further substantiate the validity of a sampling approach and also requested additional information in several specific technical areas pertaining to the bulletin.

This letter presents the results to date of the IE Bulletin 79-14 reinspection of the seven sample systems and addresses the concerns expressed by Mr. Ang during his September site visit.

During Mr. Ang's site visit he observed one case where the Walkdown Procedure requirements (to record all cases where less than 3 inch clearance to computer analyzed components) was not met. He also noted a similar deficiency on a system not previously walked down. These two cases were documented on NRC Inspection Report No. 50-416/81-37, Follow-up Item 416/81-37-01, and analyzed and corrected as indicated on Attachment No. 3. Neither represented a violation of the space required for the actual system movement.

As a result of this observation, all safety related piping systems will be reinspected for this 3 inch envelope requirement and results will be documented and available for NRC review. Results of only the seven chosen systems will be included in our final report. Trained personnel performing Engineering Review Team (ERT) final room and area walkdowns have been instructed to document all cases where less than 3 inch clearance is provided for computer analyzed components. These ERT reports are submitted to the appropriate engineering discipline for resolution in accordance with the ERT

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procedure. The on-going ERI clearance walkdowns will assure that adequate space has been provided for computer analyzed system movement.

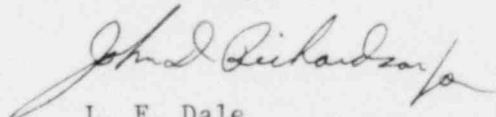
Mr. Ang also requested additional justification for acceptance of zero gap between pipe and structural members for lateral restraints. Attachment No. 4 is a report outlining our position on the subject.

Mr. Ang requested additional clarification concerning conformance to bulletin requirements for those applicable systems analyzed by organizations other than our A-E. These systems are covered by the same IE Bulletin 79-14 Walkdown Procedure and are inspected by Bechtel in accordance with the Walkdown Procedure. Although analyses information for vendor supplied subsystems and partial systems is not included in this report, any deviations from the drawing or specification requirements are submitted by Bechtel to the original stress analysis organization for review and reanalysis. Confirmation of appropriate analyses or reanalyses for General Electric's main steam and recirculation piping will be included in our final report.

Assuming that completion of the remaining open items on the seven sample systems yields similarly favorable results, i.e. that no significant as-built vs. as-designed adverse safety implications are detected, it is our intention to submit the summary sheets for the seven chosen systems as our final report on IE Bulletin 79-14. Upon resolution of open items a final and complete report will be submitted to the NRC.

We are proceeding on the basis that our sampling program satisfies the intent of IEB 79-14 and that our IEB 79-14 program is acceptable to the NRC. Should you have questions or comments please contact Mr. John D. Richardson.

Yours truly,



L. F. Dale
Manager of Nuclear Services

DDW/SHH/JDR:rg

cc: Mr. N. L. Stampley
Mr. R. B. McGehee
Mr. T. B. Conner
Mr. G. B. Taylor

Mr. Richard C. DeYoung, Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
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Director, Office of Nuclear Reactor Regulation
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Attachment No. 1 to AECM-81/474

1. Specification 9645-M-204.0, Revision 6. Design Specification for Field Fabrication and Installation of Nuclear Service Piping and Instrumentation
2. Specification 9645-MS-16, Revision 20, Criteria for Hanger Installation
3. QC Instruction 0726T, Revision D, Piping, Mechanical, I&C Monitoring Checklist
4. QC Instruction 0715T, Revision E, Piping Inspection Activities
5. Construction Work Plan/Procedure (WP/P) - P-1, Revision 1, Large Pipe and Small Pipe Work Plan and Inspection Records
6. WP/P-P-5, Revision 1, Large Pipe and Small Pipe Hanger Installation and Inspection
7. WP/P-P-6, Revision 0, Valve Installation and Inspection
8. WP/P-P-10, Revision 2, Field Design Change (Redline) Procedure for Pipe Hangers, Supports, Guides, and Anchors
9. WP/P-P-11, Revision 1, Field Design Change (Redline) Procedure for Field Designed Small Pipe

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SUMMARY OF WALKDOWN ITEMS

Attachment No. 2 to AECM-81/474, Page 1 of 7

GRAND GULF NUCLEAR STATION

UNIT 1

SYSTEM E22High Pressure Core Spray

ITEM NO	DESCRIPTION	REANALYSIS REQUIRED YES/NO	REWORK REQUIRED YES/NO	ACTION REQUIRED	COMMENTS
1	Clearance between small line HBD-113 shown on dwg. FSK-H-1087-013-C and support No. N1P42G004H14 is only 1/8". Although thermal movement of pipe is away from support, there could still be contact during seismic event or relief valve actuation.	No	Yes	Provide adequate clearance (1/2" Min.)	Field Action. This item had already been evaluated by Field Eng. & hanger was to be reworked for other reasons.
2	Two bolts were missing on valve Q1E22F010	No	Yes	Provide necessary bolts.	Field Action. This valve had already been turned over to MP&L. Proper documents for on going testing were in order thus assuring that bolts would be replaced.

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SUMMARY OF WALKDOWN ITEMS

Attachment No. 2 to AECM-81/474, Page 2 of 7

GRAND GULF NUCLEAR STATION

UNIT 1

SYSTEM E12Residual Heat Removal

ITEM NO	DESCRIPTION	REANALYSIS REQUIRED YES/NO	REWORK REQUIRED YES/NO	ACTION REQUIRED	COMMENTS
1	Zero clearance between HVAC Flange and 18" - GBB-118 line. Thermal and seismic movements will interfere with the flange.	No	Yes	Provide adequate clearance ($\frac{1}{2}$ " min.)	The HVAC flange will not restrain the pipe movements. Clearance is required to protect the duct. The rework has since been completed.
2	Zero clearance between HVAC Duct and valve Q1E12G012 F008A-A. Thermal and seismic movements will interfere with the flange.	No	Yes	Provide adequate clearance ($\frac{3}{4}$ " min.)	Same as item 1.
3.	ID tag on valves F092B and F093B on drawing FSK-H-1085A-016B were missing.	No	Yes	Field to install ID tags on valves.	The installed valves are the correct valves to be used. The tags have since been installed
4	ID tag on valve F265A on drawing M-1348F is missing.	No	Yes	Field to install ID tag on the valve.	Same as item 3.

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SUMMARY OF WALKDOWN ITEMS

Attachment No. 2 to AECM-81/474, Page 3 of 7

GRAND GULF NUCLEAR STATION

UNIT 1

SYSTEM E51

Reactor Core Isolation Cooling

ITEM NO	DESCRIPTION	REANALYSIS REQUIRED YES/NO	REWORK REQUIRED YES/NO	ACTION REQUIRED	COMMENTS
1	Insufficient clearance between 3/4" DCB-27 line and unistrut support member at elev. 170'-6" (FSK-H-1083B-022-C). Thermal movement at this location are large.	No	Yes	Provide minimum of 1 1/2" clearance	The support will not restrain the pipe movements. Clearance required to protect support. Rework has since been completed.

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SUMMARY OF WALKDOWN ITEMS

Attachment No. 2 to AECM-81/474, Page 4 of 7

GRAND GULF NUCLEAR STATION

UNIT 1

SYSTEM C41

Standby Liquid Control

ITEM NO	DESCRIPTION	REANALYSIS REQUIRED YES/NO	REWORK REQUIRED YES/NO	ACTION REQUIRED	COMMENTS
1	Drawing number H-1082-024-C (stress drawing) shows a coupling located below support Q1C41G124R02. This coupling does not exist.	No	No	No action required. Stress will be reduced w/o coupling.	Stress analysis with coupling provides more conservative design.



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SUMMARY OF WALKDOWN ITEMS

Attachment No. 2 to AECM-81/474, Page 5 of 7

GRAND GULF NUCLEAR STATION

UNIT 1

SYSTEM B21

Nuclear Boiler System

ITEM NO	DESCRIPTION	REANALYSIS REQUIRED YES/NO	REWORK REQUIRED YES/NO	ACTION REQUIRED	COMMENTS
1	2" line is located 1 3/4" away from feedwater check valve Q1B21F010A. This will cause interference once metallic insulation is added to the feedwater line.	No	Yes	2" pipe must be located so that there is no interference after insulation is installed.	This would have been corrected at time of insulation installation, by proper modification in insulation to provide the required clearance.

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SUMMARY OF WALKDOWN ITEMS

Attachment No. 2 to AECM-81/474, Page 6 of 7

GRAND GULF NUCLEAR STATION

UNIT 1

SYSTEM P75Standby Diesel Generator

ITEM NO	DESCRIPTION	REANALYSIS REQUIRED YES/NO	REWORK REQUIRED YES/NO	ACTION REQUIRED	COMMENTS
1	ID tag on valves Q1P75F009C and Q1P75F009D were missing.	No	Yes	Field to install ID tags on valves.	Valves are standard swing check valves. These are the correct valves. The tags have since been installed.

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SUMMARY OF WALKDOWN ITEMS

Attachment No. 2 to AECM-81/474, Page 7 of 7

GRAND GULF NUCLEAR STATION

UNIT 1

SYSTEM E21Low Pressure Core Spray

ITEM NO	DESCRIPTION	REANALYSIS REQUIRED YES/NO	REWORK REQUIRED YES/NO	ACTION REQUIRED	COMMENTS
1	Drawing No. H-1087-015-C support No. S-8 PG-12 support had one missing bolt.	No	Yes	Add bolt as required by design.	The remaining bolts are sufficient to carry the design loads.
2	Drawing No. HL-1348L support No. N1E12G022H01 Stress Group approved relocation of 12" but support was actually moved 1' - 8½".	Yes	No	Stress Group to re- run problem number 204.	Stress Group anticipates no effect. Analysis will be done to confirm.

RESPONSE TO BCQM-81/283
NRC INSPECTION REPORT NO. 50-416/81-37
FOLLOW-UP ITEM 416/81-37-01

The Residual Heat Removal System (RHR) was one of the seven systems reinspected by Bechtel as part of their IEB 79-14 confirmatory walk-downs. Portions of RHR piping shown on Bechtel drawing M-1348A, Revision 20, were inspected to determine the adequacy of the original inspections and the confirmatory walkdowns. The Standby Service Water Systems was not one of the systems reinspected during the Bechtel IEB 79-14 confirmatory walkdowns. Portions of the Standby Service Water piping shown on Bechtel drawing M-1358K, Revision 8, were inspected to further determine the adequacy of the original piping system inspections. In addition, the following pipe supports shown on the two drawings previously mentioned were also inspected to verify the adequacy of the pipe support reinspection program.

Q1E12G012H01
Q1E12G012R02
Q1E12G012R01
Q1P41G010H01
Q1P41G010C02
Q1P41G010R02

The inspection revealed that clearance and interference conditions existed in both the RHR System and the Standby Service Water System. The conditions noted had not been previously documented and evaluated for its effects on the piping analysis.

The specific conditions noted did not appear to be significant conditions to the Bechtel Stress Analyst who concurrently performed the inspection. The pipe movements noted on the pipe supports for the affected piping appeared to confirm this. However, the apparent programmatic lack of inspections, documentation and evaluation of piping clearance and interference conditions was discussed with the licensee. The licensee agreed to perform additional inspections to identify, document and evaluate such conditions. This item was identified as Inspector Follow-up Item 81-37-01, Lack of inspections for piping and pipe support clearances and interferences. This item shall be inspected during subsequent inspections.

Response to NRC Follow-Up Item 416/81-37-01:

Bechtel Procedure No. 9645-SG-1 was developed for use in the reinspection of seven (7) piping systems as part of the IEB 79-14 confirmatory walkdown. A requirement of this document is that each system element, which is located within three (3) inches of any rigid structure, be documented and evaluated to determine any effect on system operation and acceptability. As noted in follow-up item 416/81-37-01, several conditions were identified during the NRC site visit where this condition (i.e., a clearance less than 3") existed but was not documented in the Bechtel walkdown package.

RESPONSE TO BCQM-81/283

In evaluating the conditions identified during the NRC site visit, Bechtel has determined that no corrective action is required for these items. The installation, as it exists, does not result in any interferences when considering both static and dynamic system deflections.

Since other similar conditions might have been omitted inadvertently by the walkdown team, the following corrective action has been implemented:

1. The seven (7) systems evaluated per the requirements of document 9645-SG-1 will be reinspected on or before December 31, 1981 to ensure that other possible clearance problems were not omitted by the initial walkdown team. All clearance related conditions will be documented and evaluated.
2. The remaining systems, not within the scope of document 9645-SG-1, will be reviewed by the Engineering Review Team (ERT). In a room-by-room review, this team will document all clearance related conditions utilizing the criterion of document 9645-SG-1. These data will be forwarded to Bechtel Engineering for evaluation.

The above actions will provide added confidence that all potential interferences and clearances are documented and evaluated.

NRC Inspection Report No. 50-416/81-37

Follow-Up Item 416/81-37-02

Bechtel Specification 9645-MS-16, Paragraph 2.6.3 allows piping with operating temperatures less than 150°F to have a zero gap with pipe supports. Normal construction and inspection practices, however, indicate that the support inspections were normally performed subsequent to field fabrication and installation of the pipe support. Consequently, the inspection would not identify any stresses that could have been induced during field fabrication and installation of pipe supports with zero clearance. A/E agreed to study the question and provide a resolution.

Response to NRC Follow-Up Item 416/81-37-02:

Per Bechtel document No. 9645-MS-16, zero gap between piping and pipe support is allowed only when the maximum operating temperature of the system is less than 150°F. Our justification for allowing zero gap is as follows:

1. The radial expansion of piping and the shrinkage of weld material during installation creates a strain which is very small in magnitude. The resulting clamping forces are insignificant.
2. The theoretical clamping force associated with this small magnitude of strain is realistically decreased due to the inherent flexibility of the two components in contact (i.e., pipe and the flange of the pipe support structural steel member).
3. The axial movement of low temperature systems at box type restrains will generally be very small thus creating small loads due to the clamping effect. This is particularly true when the axial movement is along the weak axis of the associated support steel member, which usually is the case.
4. Thermal stresses which would result from zero gap are secondary in nature and thus self-relieving.
5. In any loaded assembly a certain amount of strain will take place before the system starts to exhibit linear loading characteristics. This phenomenon is shown in Figure 1 and is caused by surface roughness and any out-of-flatness (or roundness) of the parts in contact.

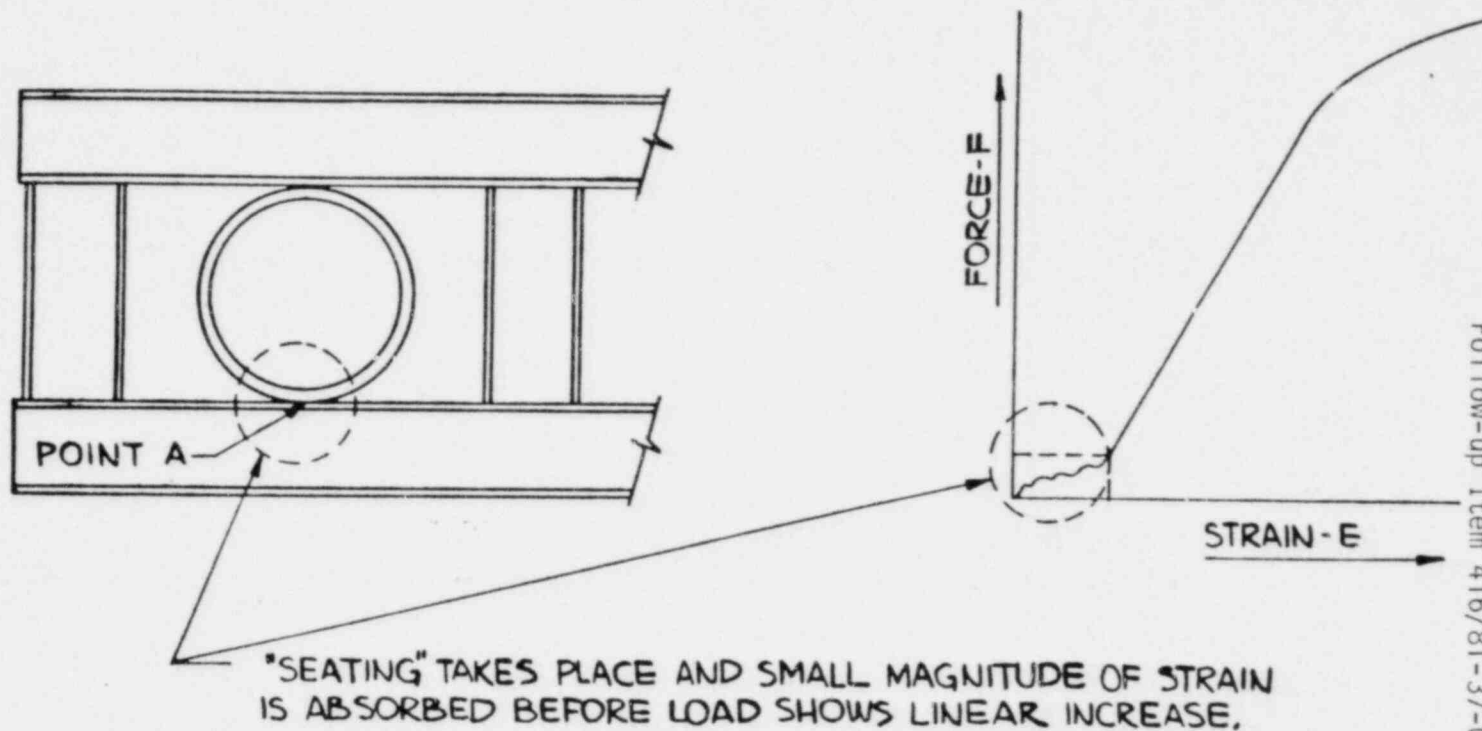


6. Bechtel's general practice for support installation can be summarized as follows:

- a) Pipe is always complete prior to hanger installation and the support is erected to suit pipe location and not the design drawings.
- b) The hanger drawing is revised whenever the deviations exceed the limits of Specification 9645-MS-16 (criteria for hanger installation) and the support is marked as per "red line" procedures.
- c) Hanger engineer routinely does a pre-inspection to check for piping installation compliance.
- d) During hanger installation the pipe is always supported by temporary supports to maintain the proper pipe layout.

Therefore, based on the above installation practices the possibility of "cold springing" is very remote.

FIGURE 1
RESPONSE TO NRC FOLLOW-UP ITEM 416/81-37-02



CLAMPING FORCE DEVELOPED AT POINT A DEPENDS ON:

- (1) MAGNITUDE OF STRAIN
- (2) FLEXIBILITIES OF SUPPORT STEEL AND PIPE
- (3) SURFACE CHARACTERISTICS OF PIPE AND SUPPORT STEEL

Response to BCOM-81/283
NRC Inspection Report No. 50-416/81-37
Follow-up Item 416/81-37-02