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THE SOUTHERN ELECTRIC SYSTEM

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December 20, 1990

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

PLANT HATCH - UNIT 1
NRC DOCKET 50-321
OPERATING LICENSES DPR-57
IE BULLETIN 79-14

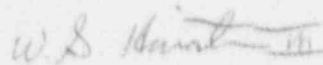
Gentlemen:

On July 2, 1979, the NRC issued IE Bulletin No. 79-14, Seismic Analyses for As-Built Safety-Related Piping Systems, which requires licensees to verify each analyzed safety-related and Seismic Category 1 piping system has been inspected to ensure the installation is consistent with the design documents used in the seismic analyses. Where deviations are identified, evaluations are required to assess the impact on system operability and code compliance. Corrective actions are to be taken, as required.

By letter dated July 21, 1988, Georgia Power Company (GPC) transmitted to the NRC the Plant Hatch - Unit 2 Summary Report relative to IE Bulletin 79-14. In the letter, GPC committed to implement all modifications associated with the Bulletin for Unit 1 by the end of the Unit 1 1990 refueling outage. Based on GPC's review and evaluation of the Unit 1 safety-related piping systems and their supports, approximately 1440 pipe supports have been modified to comply with long-term code commitments. All pipe support designs, installations, and stress analyses for Unit 1 within the scope of IE Bulletin 79-14 currently meet the Final Safety Analysis Report (FSAR) and code commitments.

The enclosure to this letter contains the Unit 1 Summary Report, which describes the actions completed for IE Bulletin 79-14 closeout. If you have any questions in this regard, please contact this office at any time.

Sincerely,


W. G. Hairston, III

SRP/sp

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U.S. Nuclear Regulatory Commission

December 20, 1990

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Enclosure: Summary Report, IE Bulletin 79-14, Seismic Analyses for
As-Built Safety-Related Piping Systems, E. I. Hatch Nuclear
Plant - Unit 1.

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ENCLOSURE

PLANT HATCH - UNIT 1
NRC DOCKET 50-321
OPERATING LICENSE DPR-57
SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

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SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

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SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

EXECUTIVE SUMMARY

United States Nuclear Regulatory Commission (USNRC) IE Bulletin No. 79-14, issued July 2, 1979, requires licensees to verify each analyzed safety-related and Seismic Category I piping system has been inspected to ensure the installation is consistent with the design documents used in the seismic analysis. Where deviations are identified, evaluations are required to assess the impact on system operability and code compliance. Corrective actions are to be taken, as required.

In order to comply with the requirements of IE Bulletin 79-14, Georgia Power Company (GPC) evaluated the safety-related piping systems at the E. I. Hatch Nuclear Plant (HNP) - Units 1 and 2 to verify seismic analyses input information conforms to the actual configuration of the safety-related piping systems and their supports. This report addresses the Unit 1 evaluation, results, and implementation of modifications. The Unit 2 Summary Report was transmitted to the NRC by GPC letter dated July 1, 1988.

As the result of GPC's review and evaluation of the Unit 1 safety-related piping systems and their supports, approximately 1440 pipe supports have been modified to resolve potential short-term operability concerns and/or to comply with long-term code commitments. All pipe support designs, installations, and stress analyses for Unit 1 within the scope of IE Bulletin 79-14 currently meet the Final Safety Analysis Report (FSAR) and code commitments.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

1.0 INTRODUCTION

On July 2, 1979, the NRC issued IE Bulletin 79-14 to address concerns regarding safety-related piping systems not installed in conformance with design documents. Revision 1 to the Bulletin was issued on July 18, 1979; the initial supplement was issued on August 15, 1979; and Supplement 2 was issued on September 7, 1979 (Reference 1). The specific concern of IE Bulletin 79-14 and its subsequent revisions was deviations between the design documents and the plant as-built condition, which could potentially impact the validity of the piping seismic analysis. The Bulletin applies to all safety-related piping with a 2.5-inch nominal diameter and greater, and to Seismic Category I piping, regardless of size, which was dynamically analyzed using a computer.

IE Bulletin 79-14 requires that each safety-related and Seismic Category I piping system be inspected to verify the installation is consistent with the design documents used in the seismic analysis. Where significant deviations are identified, licensees are required to resolve them by establishing system operability and code compliance by analysis, and/or modifications to the piping system or its supports.

To satisfy the Bulletin's interim requirements, 30-, 60-, 120-, and 180-day reports were prepared and submitted to the NRC (References 2 through 5). These reports summarized the systems to be inspected, inspection procedures, relevant design documents, and the inspection results. Individual and collective assessments of deviations were performed by qualified stress analysts. The assessments resulted in identification of three deviations significant enough to potentially affect system operation during a safe-shutdown earthquake (i.e., reactor pressure vessel (RPV) head vent, residual heat removal (RHR) discharge to RPV head spray, and main steam bypass to condenser valve chest). Licensing Event Reports (LERs) were submitted for these nonconformances and modifications were implemented in a timely manner.

Subsequent to issuing the interim reports, a more detailed second walkdown was completed on all piping and supports associated with IE Bulletin 79-14 stress problems to verify the judgments and conclusions that had been previously reported and to more accurately align the mathematical stress models with the as-built piping configurations.

This report summarizes the work completed for HNP - Unit 1 to verify the effects of deviations identified during the second walkdown for system operability and to document conformance of all safety-related and Seismic Category I piping with FSAR commitments for long-term code compliance.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

2.0 TASKS, ACTIVITIES, AND WORK FLOW

Except as noted below, all engineering work to identify and evaluate deviations affecting the seismic analysis of as-built safety-related piping systems was completed by Bechtel Corporation in accordance with Bechtel Project Procedure SPI-12.1-20. Figure 1 identifies each activity and summarizes the process utilized to assure compliance with IE Bulletin 79-14 requirements. Details pertaining to each activity are described throughout this report.

As described in Section 4.0, Evaluation of Piping, Southern Company Services (SCS) was responsible for the stress reanalysis of torus attached piping (TAP). Portions of the main steam piping and recirculation system piping were evaluated for IE Bulletin 79-14 by General Electric (GE), the original designer of these systems. Finally, EDS Nuclear Incorporated (EDS) assisted Bechtel in the evaluation of the control rod drive (CRD) system insert and withdrawal lines and supports.

Except for new TAP supports designed by SCS, all required design modifications for short-term operability and long-term code compliance were coordinated with Bechtel .

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14 SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

3.0 FIELD WALKDOWN/SURVEILLANCE OF PIPING SYSTEMS

In order to verify the compatibility of the as-built plant conditions with design documents, a walkdown was required for all analyzed safety-related and Seismic Category I piping and supports. The walkdown served to identify deviations between the as-built plant configuration and design documents.

An initial walkdown was conducted in 1979 to satisfy the IE Bulletin 79-14 interim requirements. Results and conclusions documented in the 30-, 60-, 120-, and 180-day reports were based on this initial walkdown (References 2 through 5).

In late 1979, the details of the initial walkdown were determined to be insufficient to achieve full compliance with the requirements of the Bulletin. A more detailed second walkdown was initiated in accordance with Plant Hatch procedure Unit 1-10124, Revision 4. The inspections of accessible areas were performed during 1980, and most areas inaccessible during power operation were inspected during the Spring 1981 outage. Where radiation levels prohibited an inspection of piping and supports, the walkdown packages were flagged to indicate the same, for future assessment of these areas. A total of 238 walkdown packages containing marked-up isometrics and support drawings documenting as-built configurations were generated. The walkdown packages were reviewed for completeness, and missing information was retrieved using a Request for Additional Data (RAD) form. The originals of the second walkdown packages and RADs are currently maintained by Bechtel. The second walkdown packages served as the final basis for all IE Bulletin 79-14 evaluations of safety-related and Seismic Category I systems. As a result, no permanent plant record was maintained for the initial walkdown.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14 SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

4.0 EVALUATION OF PIPING

4.1 System Identification

All the safety-related and Seismic Category I systems, portions of which required evaluation for IE Bulletin 79-14, are identified in Table 1. Copies of the IE Bulletin 79-14 second walkdown packages described in Section 3.0 are available for all the above identified systems. The systems that are not safety-related and Seismic Category I, but may have a portion of the system seismically supported (i.e., the fire protection system not included in the P41 System or portions of nonsafety-related piping that are seismically analyzed for seismic II/I reasons), were not required to be included in the evaluation.

4.2 Nonconformance Criteria

Nonconformances between the design drawings and the as-built piping systems were identified by comparing the as-built data to the data used in the seismic analysis of the systems. The as-built data were collected from the IE Bulletin 79-14 second walkdown packages described in Section 3.0. Deviations were as defined in Bechtel Project Procedure SPI-12.1-20.

4.3 Evaluation Criteria

All second walkdown package deviations in each stress problem were reviewed against the latest stress analysis of record at the time of the evaluation. Deviations were identified, evaluated, and dispositioned in accordance with Bechtel Project Procedure SPI-12.1-20.

4.3.1 Initial Screening Review

During the initial screening phase (1979 through 1981), individual and collective assessments of deviations were made for each stress problem to determine the potential impact on plant operability and the existing seismic analysis. Screening calculations were generated to document dispositions of identified deviations. Each stress problem was assigned to one of the three cases described below, depending on the number and severity of each deviation:

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14 SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

1. No deviations or very minor deviations.
2. Numerous minor deviations, or possibly a more important single deviation, none of which taken collectively or singularly were judged to jeopardize system operability.
3. One or more deviations judged to be significant enough to jeopardize system operability.

For stress problems included under Case 3, preliminary stress reanalyses were generated, and supports were reviewed for operability. Modifications were promptly implemented to resolve all potential short-term operability concerns. LERs were submitted to the NRC, as required.

4.3.2 Code Compliance Review

All stress problems were evaluated for code compliance. Permanent calculations were created during the code compliance evaluation and maintained as part of permanent plant documentation. Based upon guidance provided in the IE Bulletin 79-14 evaluation procedures, experienced stress analysts, with the concurrence of a group leader, selected problems requiring reanalysis. The selection process was based on the extent of the deviations, considering the effect of deviations on pipe stresses, support loads, nozzle loads, valve accelerations, etc. If there was any doubt relative to the acceptability of the existing design, the problem was reanalyzed.

4.4 Re-Analysis of Stress Problems

As a result of the evaluations described in Subsection 4.3, 205 out of a total of 213 pipe stress problems were reanalyzed to demonstrate the systems met code compliance. The remaining eight problems were not reanalyzed due to one of the following reasons:

1. No deviations existed between the as-built and the as-analyzed piping.
2. Minor deviations, as defined by the IE Bulletin 79-14 evaluation procedure, did not significantly affect the piping analyses.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

The reanalysis effort for IE Bulletin 79-14 was carried out in conjunction with the Mark I Containment Qualification Program, otherwise known as the Long-Term Program (LTP). Therefore, the associated LTP loads were incorporated into applicable stress problems for design evaluations. In addition, during the IE Bulletin 79-14 compliance review program (1979-1984), several design changes were also implemented for regulatory compliance and/or improvement of plant operation.

SCS was responsible for stress reanalysis of all torus attached piping (TAP) included in the LTP. GE was responsible for the evaluation of portions of the Main Steam and Recirculation System Analyses. Detailed documentation for all reanalyzed problems was generated to update design records and is maintained on file by Bechtel, SCS, or GE.

For all reanalyzed problems, new loads were developed for evaluation of support and penetration designs.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

5.0 PIPE SUPPORT EVALUATION

5.1 Initial Screening Review

During the initial screening phase of the second walkdown packages, pipe support deviations were evaluated for short-term operability to assess the impact on support structural adequacy and the piping stress analysis. The operability evaluations were completed in accordance with Bechtel Procedure SPI-12.1-20, Revision 5. Modifications and new support designs were implemented to resolve all short-term operability concerns. LERs were forwarded to the NRC, as appropriate.

5.2 Code Compliance Review

All supports on piping systems within the scope of IE Bulletin 79-14 were evaluated for code compliance based on the as-built information obtained from the second walkdown packages. During the reanalysis effort, new support and penetration loads were generated for review. Load evaluations were completed by Bechtel, SCS, and GE, as required. All support reviews completed by Bechtel, SCS, and GE were in accordance with their respective internal procedures to complete evaluations within their scope. Detailed calculations were created and are maintained for code compliance evaluations. Pipe support modifications were issued for implementation, as required, in accordance with established plant procedures. (Reference Section 7.0.)

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14 SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

6.0 RESULTS

Based upon the piping and support reviews in which short-term operability was assessed, 96 Proposed Design Change Requests (PDCRs) were issued to GPC for implementation. The modifications were completed not only to resolve operability concerns but also to implement certain design changes that were judged to be prudent. This effort was completed between 1979 and 1981.

Piping and support load reviews for long-term code compliance were completed between 1981 and 1990. Modifications were issued to the plant and implemented in accordance with established plant procedures. Modifications included the addition, deletion, relocation, and/or changing/upgrading of pipe supports. In some cases, to bring stresses within code allowables, piping was rerouted to reduce loads on nozzles, or tees were reinforced.

As a result of the efforts described above, modifications were implemented on approximately 1440 supports.

It should be emphasized that not all design modifications resulted solely from IE Bulletin 79-14 evaluations. As described in Subsection 4.4, the LTP and plant improvement design changes were considered in conjunction with the IE Bulletin 79-14 efforts. The total number of supports requiring modification reflects those that resulted from considering the combined effects of IE Bulletin 79-14 deviations, LTP loads, and plant improvement design changes.

One portion of piping was classified as inaccessible in that it was physically impossible to obtain as-built information. The inaccessible piping involves approximately 17 feet of pipe and 3 supports on a 2-inch diameter line located directly under the reactor vessel. The original walkdown identified this piping as inaccessible. Subsequent attempts were made to access the area; however, each attempt resulted in the same conclusion. The subject pipe is small bore and was field routed during original construction. An as-built isometric and inspection sheets were reviewed to verify the pipe and supports were installed in accordance with the isometric drawing. The current design loads are slightly greater than the original design loads. However, the difference between the current and the original design loads is not great enough to warrant questioning the structural integrity of the originally installed supports. In addition, to further demonstrate the subject pipe is acceptable, a study was conducted, assuming all three pipe supports in the inaccessible area were not functional. The results showed that, even with these improbable conditions, the pipe stresses slightly exceed code allowables and adjacent supports experience only moderate load increases. Based on the above information, it is reasonable to conclude the inaccessible piping and supports satisfy code requirements.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

7.0 IMPLEMENTATION OF MODIFICATIONS

Once the engineering evaluation determined the need for a modification to a piping system or support, modification drawings were generated and issued. The design input to the modification drawings came from new or revised support and pipe stress analyses, as well as field feasibility checks of proposed design changes.

After achieving a workable code compliance modification, PDCR and/or DCR documents were issued for implementation. These modifications were implemented in accordance with established plant procedures. Engineering efforts during implementation included pipe support walkdowns and resolution of field interferences that were established after the original modifications were issued. During actual construction, deviations from the issued design documents were coordinated with the A/E for review and approval through Field Change Requests (FCRs) or Field Deviation Requests (FDRs). All of the required modifications have been completed.

Upon completion of a design modification, an As-Built Notice (ABN) or a Work Completion Notice (WCN) was generated by WPC and issued to Bechtel for review and approval. Final as-built drawings were created for each modified design and issued to the established distribution system.

The procedures governing modifications have been in effect since the completion of the second Unit 1 walkdown surveillance program and will continue to apply to all future modifications, thereby assuring plant configuration is compatible with design drawings and analyses.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

8.0 CONCLUSIONS

All engineering work required to identify and evaluate deviations affecting the seismic analysis of as-built safety-related and Seismic Category I piping systems has been completed. All pipe supports and piping included in the scope of IE Bulletin 79-14 for Unit 1 currently meet long-term code compliance criteria. Required modifications have been implemented. Procedures are in effect to assure the plant configuration is compatible with design drawings and analyses. Documentation, as described throughout this report, has been generated to support these conclusions.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

REFERENCES

1. U.S. Nuclear Regulatory Commission IE Bulletin No. 79-14, Seismic Analyses for As-Built Safety-Related Piping Systems, July 2, 1979; Revision 1, July 18, 1979; Supplement 1, August 15, 1979; Supplement 2, September 7, 1979.
2. IE Bulletin 79-14 Thirty (30) Day Report, Letter No. 9046A, August 1, 1979.
3. IE Bulletin 79-14 Sixty (60) Day Report, Letter No. 9060, September 14, 1979.
4. IE Bulletin 79-14 One Hundred Twenty (120) Day Report, Letter No. 9082, November 9, 1979.
5. IE Bulletin 79-14 One Hundred Eighty (180) Day Report, Letter No. 9093B, December 14, 1979.

ENCLOSURE (Continued)

SUMMARY REPORT IE BULLETIN 79-14
SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEMS

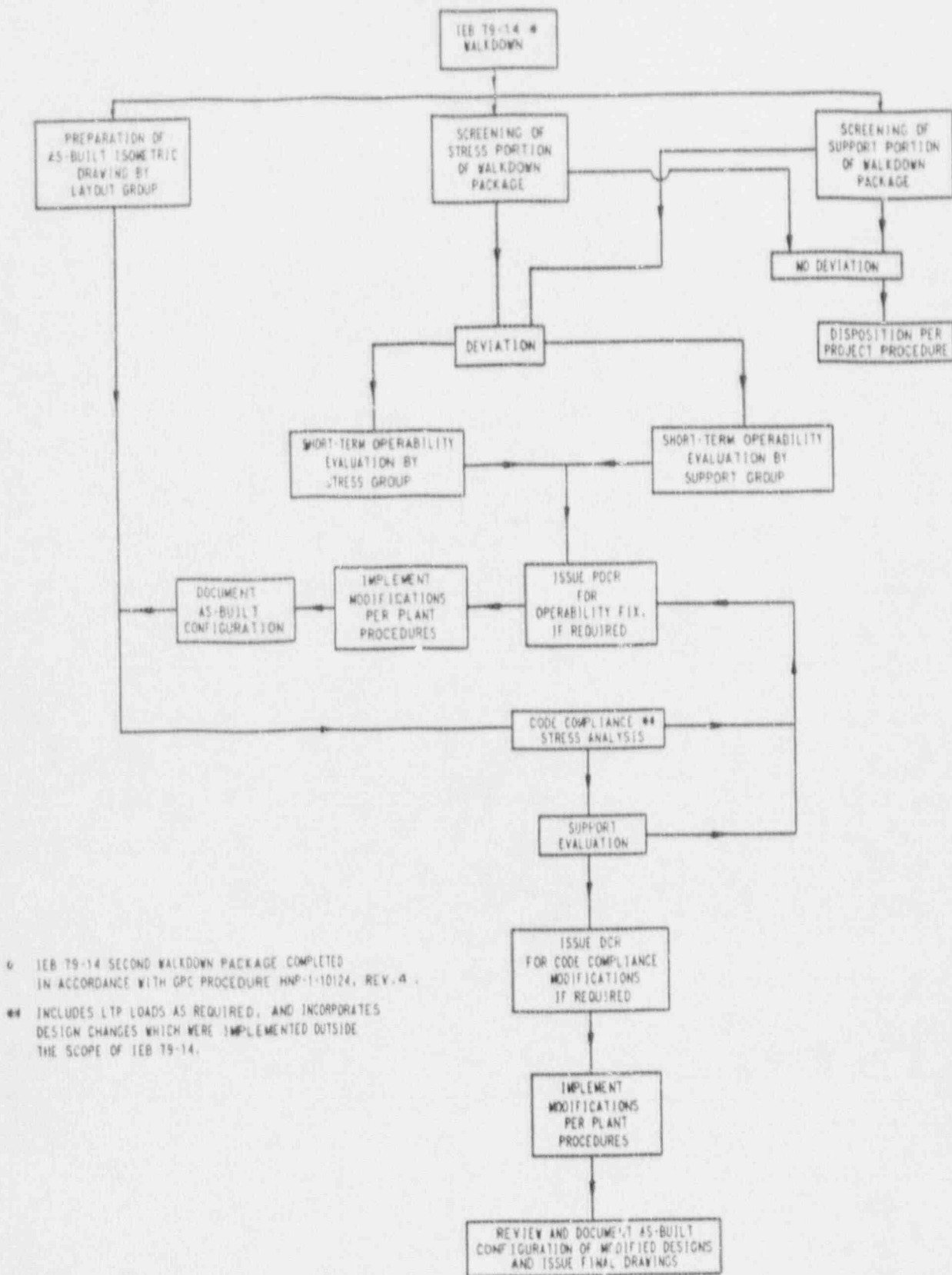
TABLE 1

UNIT 1 SYSTEMS LIST FOR IEB 79-14

<u>MPL Identifier</u>	<u>System Name*</u>
B21	Nuclear Boiler
B31	Reactor Recirculation
C11	Control Rod Drive
C41	Standby Liquid Control
E11	Residual Heat Removal (RHR)
E11	RHR Service Water
E21	Core Spray
E41	High Pressure Coolant Injection
E51	Reactor Core Isolation Cooling
G11	Radwaste
G31	Reactor Water Cleanup
G41	Fuel Pool Cooling (included in E11 system)
N11	Main Steam
P11	Condensate Supply (included in E41 and E51 systems)
P41	Plant Service Water
P42	Reactor Building (RB) Closed Cooling Water
P51	Service Air
P52	Instrument Air
R43	Diesel Generator
T43	RB Fire Protection (included in P41 system)
T45	RB Floor and Equipment Drainage (included in B31 system)
T46	Standby Gas Treatment
T48	Containment Purge and Inerting
Z41	Control Building (Main Control Room Environmental Control System - HVAC only)

* The safety-related and Seismic Category I portions of the systems were considered for compliance with IE Bulletin 79-14.

ENCLOSURE (Continued)



- * IEB 79-14 SECOND WALKDOWN PACKAGE COMPLETED IN ACCORDANCE WITH GPC PROCEDURE HNP-1-10124, REV. 4.
- ** INCLUDES LTP LOADS AS REQUIRED, AND INCORPORATES DESIGN CHANGES WHICH WERE IMPLEMENTED OUTSIDE THE SCOPE OF IEB 79-14.

FIGURE 1

WORK FLOW FOR UNIT 1 IEB 79-14 COMPLIANCE