GULF STATES UTILITIES COMPANY
POST OFFICE BOX 2951 · BEAUMONT, TEXAS 77704
AREA CODE 713 838-6631

October 26, 1984
RBG-19294
File Nos. G9.5, G15.4.1

Mr. R. C. DeYoung, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. DeYoung:

River Bend Station - Unit 1
Docket No. 50-458
Integrated Design Inspection/Report 84-18

This letter is in response to your letter dated August 27, 1984 which transmitted the Integrated Design Inspection Report 84-18. This inspection was conducted by a team from the NRC's Office of Inspection and Enforcement over a period from April 9, 1984 to June 1, 1984 of activities authorized by NRC construction permit CPPR-145 for River Bend Station, Unit No. 1.

Enclosure A to this letter contains specific detailed responses to all deficiencies and unresolved items and to two details (A2.8-1 and A3.3-1).

In your letter transmitting the IDI report, you recommended that a limited design review be conducted by off-project Stone & Webster or Gulf States Utilities personnel to determine whether or not deficiencies similar to those found by the IDI team can be expected elsewhere. GSU will undertake such a review as described in Enclosure B. Resumes of the evaluation team members are available for NRC review. GSU will provide a summary report of the conclusions of the evaluation by January 18, 1985.

GSU is continuing the evaluation to determine the extent of deficiencies D2.3-1, D3.6-2 and DA.1-2 as noted in those detailed responses. Supplemental responses for these deficiencies will be included with our January 18, 1985 letter.

GSU wishes to commend the IDI team for their cooperation in minimizing disruption of ongoing work and for their professionalism in conducting the inspection. Should you have any questions pertaining to these responses please contact us.

Sincerely,

J E Booker

J. E. Booker
Manager-Engineering,
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/LAE/je

Enclosures

IE01
1/1

ENCLOSURE A

RESPONSES TO THE INTEGRATED DESIGN INSPECTION REPORT FOR THE RIVER BEND STATION OF GULF STATES UTILITIES COMPANY

DETAIL NO. A2.8-1

RESPONSE

Loss of the high-pressure core spray (HPCS) system is one of the many postulated single-failure scenarios that have been accounted for in the design of the River Bend Station. This has been accomplished by including in the River Bend Station design other functionally redundant, safety-related systems. Availability of these safety-related systems is ensured by adherence to the plant's technical specifications.

An alarm in the control room to indicate closure of the condensate storage tank isolation valve would not guarantee protection of the HPCS pump from damage due to loss of pump suction, unless operating personnel immediately tripped the HPCS pump. This action is not desirable, since there are conditions, such as low condensate storage tank level, when closure of this valve is normal. Thus, unnecessary degradation in the HPCS system availability would result.

A logic network could be developed to screen out normal versus abnormal valve closures prior to actuation of a control room alarm. However, a failure of this circuitry could result in a "false" alarm, causing operating personnel to trip the HPCS pump unnecessarily, again resulting in degradation of HPCS system availability.

DETAIL NO. A3.3-1

RESPONSE

River Bend Project Procedure RBP 6.24-1 (issued February 24, 1984) established a formal, standardized method for transmitting pipe stress-related data, such as that contained in Interoffice Correspondence DP-760 (which was issued several years prior to RBP 6.24-1) from the Power Division to Pipe Stress Engineering. This is accomplished by preparing a power input controlled listing (PICL).

During the preparation of the initial issue of each PICL, previously transmitted data, such as that included in Interoffice Correspondence DP-760, was reviewed and updated when necessary. As of early August, PICLs were issued for all safety-related systems with large bore (i.e., nominal diameter .2 in. or greater) piping, including the main steam and main steam safety relief valve discharge piping systems. (This system was adopted by the Project prior to the inspection to ensure that power inputs to pipe stress personnel would be complete and thorough.)

DEFICIENCY NO. D2.3-1

RESPONSE

Cause

The problems associated with the LPCI pump runout flow portion of Calculation No. PN-268 are attributed to two basic mistakes:

1. Failure to recognize that all of the data/information used to compute runout flow did not represent the most conservative approach for this mode of pump operation, including selection of the appropriate pump curve.

2. Failure to calculate/plot a system resistance curve (which would have revealed the error in graphical technique).

Extent of Condition

Pump calculations for the HPCS, LPCS, and fuel pool cooling pump will be reviewed to ensure that similar problems do not exist in other safety-related pump calculations. Additional action will be taken upon completion of this review if other problems are discovered. A supplemental response will be submitted on completion of this review.

Action to Correct Existing Condition

The LPCI runout mode portion of Calculation No. PN-268 will be revised to reflect both the most conservative data information and to include a system resistance curve. Should the results indicate a need for flow-limiting orifices, they will be added. The other portions of Calculation No. PN-268 will be reviewed to ensure that they are based upon a truly conservative set of data, information, and assumptions. Calculations found deficient as a result of the review described in Extent of Condition, above, will be corrected.

Action to Prevent Recurrence (Short Term)

The lead power engineer will issue a memorandum to all River Bend Project power engineers emphasizing the need to pay close attention to the items identified in this deficiency that are associated with the preparation and checking of calculations and to require that system resistance curves be included in all future pump calculations unless specific approval to omit such curves is granted by the lead power engineer or the Power Division Manager/designee.

DEFICIENCY NO. D2.3-2

RESPONSE

Cause

The objectives for performing Calculation No. PN-283 were reduced in scope while the calculation was being prepared as a result of ongoing dialogue between SWEC and GSU. These reduced objectives were discussed by the preparer and the reviewer; however, both overlooked the need to correct the Purpose section of the calculation to reflect the final objectives which had been established. Failure to include the potential impact of sump pump operation also resulted from the reduction in the intended goals of the calculation.

Extent of Condition

Calculation No. PN-283 is the only flooding calculation of this type which has been done. Multiple changes to the objectives of a calculation while the calculation is still in progress is a highly unusual event. A sample of 10 other power calculations was made at random, and all 10 met their objectives. Therefore, this case is considered to be an isolated event.

Action to Correct Existing Condition

Calculation No. PN-283 has been canceled. Final documentation will be provided in a new calculation, which will address the following:

Equipment Cubicles

The residual heat removal (RHR) heat exchanger cubicle is the largest of the six equipment cubicles, and therefore would result in maximum suppression pool drawdown, assuming no sump pump operation. Since all six equipment cubicles have the same type of sump instrumentation and the same capacity sump pumps, evaluating the RHR heat exchanger cubicle for suppression pool drawdown without sump pump operation envelops the other equipment cubicles.

During normal plant operations, a leak inside one of the cubicles which exceeds the sump pump capacity would be detected by a sump extreme high level alarm, which is provided by a QA Category I instrument. In addition, the QA Category I suppression pool level instruments would provide alarms to alert operating personnel when the normal low suppression pool level was reached, regardless of whether the leak exceeded the sump pump capacity.

In a postulated post-accident scenario when offsite power is unavailable, the equipment cubicle sump pumps would not be operable. Even in the worst case wherein suppression pool level may not provide positive leakage indication (due to post-accident water inventory changes and/or changing containment/drywell pressures), and the level instrument in the affected sump is assumed to be the

single failure, water loss from the suppression pool is limited to the cubicle involved. Additional, albeit indirect, indication would likely be provided as a result of electrical failures, as the electrical equipment in the equipment cubicle was flooded.

In a post-accident scenario with offsite power available, it is theoretically possible during certain scenarios for leaks which are less than a single sump pump's capacity to be masked due to sump pump operation. This condition will be fully evaluated, and appropriate actions will be taken, if required.

Crescent Area

During normal operation, leakage in excess of the sump pump capacity would be alarmed by QA Category II instruments located in each of the two sumps in this area. In addition, the QA Category I suppression pool level instruments would alert operating personnel when the normal low suppression pool level was reached, regardless of whether the leakage exceeded the sump pump capacity. Due to the narrow range between the normal high and normal low suppression pool levels, flooding of safety-related equipment in the crescent area would not likely occur prior to initiation of the suppression pool low level alarm. This will be confirmed.

Postulated post-accident scenarios, both with and without offsite power, will be fully evaluated, and appropriate actions will be taken, if required.

Action to Prevent Recurrence

Since this case is limited to a single calculation, no specific action to prevent recurrence is necessary. However, the lead power engineer will issue a memorandum to all River Bend Project power engineers emphasizing the need for careful attention to the key items associated with the preparation and checking of calculations which are identified in this deficiency and in particular, the need to identify all of the variables which impact the results of the calculation.

DEFICIENCY NO. D2.3-3

RESPONSE

Cause

Post-LOCA passive pipe failures were intended to be evaluated as a separate part of the project program for evaluating moderate energy pipe cracks (reference Project Procedure PMM-163). However, at the time of the audit, work had not begun to implement this program.

Extent of Condition

All safety-related plant areas containing liquid lines.

Action to Correct Existing Condition

Emergency core cooling system suction lines will be evaluated for post-LOCA conditions in accordance with the revised issue of PMM-163 (see Action to Prevent Recurrence, below).

Action to Prevent Recurrence

Evaluation of post-LOCA passive pipe failures will begin immediately. PMM-163 will be revised to specifically require evaluation of pipe cracks under post-LOCA conditions in addition to evaluating pipe cracks in accordance with NRC Standard Review Plan, Section 3.6.

DEFICIENCY NO. D2.3-4

RESPONSE

Cause

The following considerations determine the necessary flow rate for these fill pumps. Because so many of the considerations involved are based to a great degree on engineering judgment, no design flow calculation for this specific system was documented.

No minimum required pump flow rate is established in either GE or NRC requirement documents. In the ideal case (i.e., a zero-leakage system) the subsystem pump would run "deadheaded"; however, a minimum flow rate is necessary to remove pump heat. This flow rate has been determined by the pump supplier, and a suitable bypass flow path has been included in the River Bend Station design.

The maximum flow rate must provide a reasonable compromise of the following:

1. Provide sufficient margin so that minor boundary valve leakage will not render the subsystem pump unable to keep the line filled.

2. Ensure that excessive boundary valve leakage is not masked by having "too much" subsystem pump capacity.

3. Ensuring that the subsystem pump will not operate in runout condition for any extended period of time.

No requirements exist to establish or maintain a quantitative limit, on a valve-by-valve basis, for leakage past each of the closed boundary valves. Thus, the subsystem pump capacity needed to make up for "acceptable" leakage cannot be determined by summing individual valve leakages.

However, all the boundary valve leakage could be assumed to be passing through only those boundary valves which remain closed when the associated emergency core cooling system (ECCS) pump is performing one of its design basis functions. In this case, the leakage flow would have to be shown to not diminish its associated ECCS pump's ability to deliver its design basis flow. The 50-gpm subsystem pump capacity is considered to be well within the actual performance margin of the ECCS pumps and the margins included in the determination of the required design basis flow.

Based on the above, the current 50-gpm subsystem pump capacity is deemed adequate.

NOTE: The potential for operation of the subsystem pumps in runout will be evaluated as noted in the response to Observation No. 02.3-2.

Extent of Condition

Due to the unique circumstances involving use of a pump to maintain pressure rather than provide flow, this is considered a random deficiency.

Action to Correct Existing Condition

Calculation No. PN-048, Revision 1, will be revised to incorporate the basis for selecting 50 gpm.

Action to Prevent Recurrence

Although considered a unique condition, the lead power engineer will issue a memorandum to all River Bend Project power engineers reminding them of the need to include in calculations the appropriate bases for key design parameters.

DEFICIENCY NO. D2.3-5

RESPONSE

Cause

Calculation No. PN-048, Revision 1, was performed prior to the receipt of certified vendor curves.

The math error is the result of an oversight in the calculation checking process. This error was not detected during the review of the vendor certified performance data, because this data was considered to be adequate to meet the basic intent of the pump, i.e., to keep the ECCS discharge line filled, even though the 50-gpm point was not satisfied (refer to Deficiency No. D2.3-4).

Extent of Condition

This specific condition is limited to emergency core cooling systems (ECCS), since these are the only systems which utilize subsystem fill pumps and applies only to Calculation No. PN-048, Revision 1, since all ECCS subsystem fill pumps are addressed in this one calculation. Math errors are addressed in the response to Deficiency No. DA.1-2.

Action to Correct Existing Condition

Calculation No. PN-048, Revision 1, will be revised based upon the latest available information, and suitability of the existing subsystem fill pumps will be reverified based upon the results of this revision. See response to Deficiency No. DA.1-2 for additional corrective action regarding math errors.

Action to Prevent Recurrence

See the response to Deficiency No. DA.1-2 for preventive action regarding math errors.

DEFICIENCY NO. D2.3-6

RESPONSE

Cause

An error was made in the preparation of the RHR preoperational test procedure concerning the verification of maximum flow rate of the RHR pumps in the LPCI mode. GE Test Specification No. 22A5296AB required that any restricting orifice in the injection line be sized correctly to limit the maximum flow rate, and this requirement was added to the procedure without verifying the presence of the orifice.

Extent of Condition

This error is limited to the RHR test procedure, since LPCI and HPCS do have orifices installed in the injection line. Although the test procedure calls for sizing an orifice which is not installed, the test would have adequately verified that the maximum flow limits had not been exceeded. This error is an isolated incident, and the inclusion of the nonexistent orifice has no effect on the verification of the maximum flow limit.

Action to Correct Existing Condition

The RHR preoperational test procedure is presently under revision to correct this problem.

Act[illegible] to Prevent Recurrence

Thi[illegible] error is an isolated incident and is not indicative of a program problem. Nevertheless, a memorandum will be sent to all startup engineers to reiterate the need to cross-check GE documents against the SWEC design documents.

DEFICIENCY NO. D2.3-7

RESPONSE

Cause

An incorrect assumption was made as to using barometric pressure reading recorded at the time of flow testing, then subtracting vapor pressure at 212°F in order to correct the NPSH to 212°F. The assumption was incorrect because the barometric pressure at the time of testing may be different than standard conditions, which would then cause some effect on the NPSH value when the 212°F vapor pressure is subtracted.

Extent of Condition

The same incorrect assumption was used in the HPCS and RHR preoperational test procedures. The result of the incorrect assumptions is that NPSH readings could be affected (either positively or negatively) due to barometric pressure being different than the standard. The effect on NPSH probably would have been slight in either case, since the average barometric pressure is 14.68 psi for the past 9 years.

Action to Correct Existing Condition

The LPCS and HPCS test procedures have been revised to change the NPSH calculation. The RHR test procedure is in the process of being revised to change the NPSH calculation in the same manner.

There will be no action taken to reference the NPSH to the pump suction nozzle, since it is contrary to CE Test Specification No. 27A5296AG. The requirement to verify NPSH greater than 5 feet at a reference location 2 feet above the pump mounting flange has been met by the procedure. Correcting to the pump section nozzle would be of no added benefit, since the design criteria is specified at the reference location.

Action to Prevent Recurrence

There is no further action required to prevent recurrence, since the problem is confined to the previously mentioned systems.

DEFICIENCY NO. D2.4-1

RESPONSE

Cause

Originally the River Bend Station design included compressors which met the basic GE pressure and flow requirements. However, the vendor canceled the purchase order at a time when no other ASME III certified compressor manufacturers existed. Due to the advanced stage of River Bend Station design and construction, the impact of a total system redesign concept was severe. Since Tennessee Valley Authority (TVA) had spare ASME III compressors which had been procured for use in a BWR-6 as part of the safety relief valve air supply system, it was decided to procure compressors from TVA even though it was realized that they did not meet the basic pressure and flow requirements that applied for River Bend. Since these compressors had been specifically procured for use in the BWR-6 plant, it was believed that they could meet the underlying basis for the GE-required pressure and flow requirements when properly integrated into the River Bend Station design.

This approach necessitated the evaluation of additional underlying GE criteria which previously did not require evaluation since they were satisfied by meeting the basic GE pressure and flow requirements.

The particular item addressed in this deficiency stems from a misunderstanding by both the preparer and the reviewer regarding how to apply these underlying GE criteria directly to River Bend Station design for such a unique backfit type change.

Extent of Condition

Due to the unique condition of having to "make the design fit the equipment" (as opposed to the normal situation where the equipment is specified to meet the design requirements), this condition is limited to the air supply system for the main steam safety relief valves.

Action to Correct Existing Condition

Clarification of the appropriate criteria to apply directly the River Bend design will be obtained from GE and then Calculation No. PN-255, Revision 1, will be revised.

Action to Prevent Recurrence

Since this is limited to a unique situation, no specific action to prevent recurrence is required.

DEFICIENCY NO. D2.4-2

RESPONSE

Cause

Calculation No. PN-255, Revision 1, was not revised when the reduction in air compressor output was identified because other information (identified in the calculation as assumptions requiring confirmation) needed to finalize the calculation was still not available.

Extent of Condition

This change in basic compressor data is due to having to substitute compressors late in the overall stage of plant design (see response to Deficiency No. D2.4-1). Such a basic equipment parameter change is unique at this stage of the project, and therefore this condition is limited to Calculation No. PN-255, Revision 1.

Action to Correct Existing Condition

Calculation No. PN-255, Revision 1, will be revised to reflect the latest available information.

Action to Prevent Recurrence

Since this is limited to a unique situation, no specific action to prevent recurrence is necessary.

DEFICIENCY NO. D2.4-3

RESPONSE

Cause

The cause stems from having to substitute compressors of a different design late in the overall stage of the plant design. (See response to Deficiency No. D2.4-1 for additional details.)

Extent of Condition

Due to the unique condition of having "to make the design fit the equipment" (as opposed to the normal situation where the equipment is specified to meet the design requirements), this condition is limited to the air supply for the main steam safety relief valves. (See response to Deficiency No. D2.4-1 for additional details.)

Action to Correct Existing Condition

SWEC has obtained GE concurrence that the combination of safety- and nonsafety-related compressors can meet the GE requirements (reference SWEC Letter No. RBV-2087 dated September 9, 1984, and GE Letter No. GSS-4309). Instrumentation for monitoring the supply pressure is addressed in the response to Deficiency No. D2.4-5. No additional action is planned at this time.

Action to Prevent Recurrence

Since this condition is limited to a unique situation, no specific action to prevent recurrence is required. However, the lead power engineer will issue a memorandum to all River Bend Project power engineers reminding them that when requirements established by another organization cannot be implemented as written, any interpretation or alternative must be submitted in a timely manner for approval by that organization.

DEFICIENCY NO. D2.4-4

RESPONSE

Cause

This concern stems from a failure to realize at the time Manufacturer's Standard Society Procedure MSS-SP-61 was invoked that actual test conditions might not envelop those that would exist when the valve was placed into service and might not be equivalent to providing "bubble tightness."

Extent of Condition

This condition is limited to the check valves used at the inlet to the automatic depressurization system air accumulators.

Action to Correct Existing Condition

Although all valves have been delivered to the site, the valve procurement specification will be changed to require bubbletight leak testing in case spare/replacement valves are procured in the future by means of this specification.

NOTE: The appropriate leakage rate for periodic testing is addressed in response to Deficiency No. D2.7-2.

Action to Prevent Recurrence

The lead power engineer will issue a memo to all River Bend power engineers reminding them that requirements established by another organization must be implemented as written; if this is not possible, any interpretation or alternative must be approved by that organization.

DEFICIENCY NO. D2.4-5

RESPONSE

Cause

An evaluation of all Regulatory Guide 1.97 requirements applicable to the use of a safety-related and nonsafety-related compressor in combination to provide pneumatic supply pressure for the ADS had not been completed at the time of the inspection (refer to the response to Deficiency No. 2.4-1).

Extent of Condition

This condition represents a unique situation of having to "make the design fit the equipment" (as opposed to the normal situation where the equipment is specified to meet the design requirements) and is limited to the air supply for the main steam safety relief valves.

Action to Correct Existing Condition

The need for providing additional safety-related instrumentation will be evaluated to satisfy Regulatory Guide 1.97, and any changes required will be made. To date, the design of pressure transmitters 1LSV*PT3A and 3B has been upgraded to QA Category I.

Action to Prevent Recurrence

Since this is a unique situation, no specific action is needed to prevent recurrence.

DEFICIENCY NO. D2.4-6

RESPONSE

Cause

Even though the air supplies for the automatic depressurization system (ADS) valves are segregated into two independent divisions (as required by GE), for a select group of postulated reactor coolant pressure boundary (RCPB) breaks, ADS valves in both divisions are required to be operable, in spite of a current single failure which would otherwise disable one entire division (i.e., loss of a diesel generator).

This is accomplished by ensuring that a minimum of 150 psig of air is maintained in each ADS air accumulator subsystem during operation (i.e., prior to initiation of the postulated RCPB break event) and by limiting the allowable leakage from each ADS air accumulator subsystem.

This deficiency stems from a failure to fully understand that the leaktight integrity of the ADS accumulator subsystem must be considered as well as the sizing of the external air supply (e.g., air compressors) in order to provide an adequate air supply for all postulated plant conditions. This is attributed to not realizing the significance of this unique case wherein equipment in both safety-related divisions must be operable even though one of the divisions is otherwise disabled due to a postulated single failure.

Extent of Condition

This condition is limited to the ADS air supply system.

Action to Correct Existing Condition

The need to maintain both a minimum pressure in, and leakage integrity for the ADS accumulators for satisfying the short-term ADS air supply need has been identified (see response to Deficiency No. D2.4-3). Calculation No. PN-255, Revision 1, will be revised to ensure that the proper assumptions have been made regarding the long-term ADS supply requirements and the effects of single failure.

Action to Prevent Recurrence

Since this is a unique case, no specific action is needed to prevent recurrence. However, the Lead Power Engineer will issue a memo to all River Bend Project power engineers emphasizing the need for careful attention to the key items identified in this item that affect the preparation and checking of calculations.

DEFICIENCY NO. D2.5-1

RESPONSE

Cause

Sources of information and references were identified in the body of the calculation during calculation preparation. However, a few references were omitted in the reference section of the calculation, apparently because of a failure to recognize the importance of listing all references in the reference section of the calculation.

Extent of Condition

The remaining 17 jet impingement target/load calculations, which were not referenced in the deficiency, were reviewed for the cited condition, and an additional 3 calculations were found to contain a similar condition.

Action to Correct Existing Condition

Calculation Nos. CBA-1746, 1766, 1736, 1676, and 1549 have already been revised to include all references. The balance of the deficient calculations, Calculation Nos. CBA-1553, 1562, and 1777, will also be revised to include all references.

Action to Prevent Recurrence

The lead engineering mechanics engineer will direct calculation preparers and reviewers in writing to include all references in the reference section of their calculations.

DEFICIENCY NO. D2.5-2

RESPONSE

We do not agree that this item constitutes a deficiency for the following reasons.

When Calculation No. CBA-1549, Revision 1, was issued, the correct jet impingement loads to be used for design purposes were transmitted to responsible disciplines. At the time the inspection was conducted, the data file, which identified the targets correctly, was still in a preliminary status and was used solely for system evaluation of jet impingement targets, for which task the loads were irrelevant. The only inconsistency was the incorrect entry of the jet impingement load for line RHS-010-19-1, and this information was not used for any purpose.

The data file has since been revised to reflect the current loading condition.

DEFICIENCY NO. D2.5-3

RESPONSE

We do not agree that the cited condition constitutes a deficiency for the following reasons.

A majority of the structural design changes occurred because the structural steel members were revised to incorporate the jet impingement loading. Furthermore, all jet impingement loading information memos (DEMs) transmitted to the Structural Division have been designated "For Design Use Only" and not "Final." It is the intent of the project to revise and finalize the jet impingement calculations incorporating various changes, including those in structural steel members, once the pipe breaks are finalized. This process is documented in the project program (PMM-152) for high-energy line break evaluation. The targets would have been updated and verified during system walkdown. In our opinion, therefore, it is not necessary to revise the jet impingement target loading calculations until after the break locations are finalized.

The current program provides for a cost-effective and rational project approach to:

1. Perform jet impingement target evaluation and implement in-plant design.

2. Maintain interim review of in-process revisions and correct the calculations for critical changes.

3. Close the loop at the end when pipe breaks are finalized, using updated calculations during system walkdown to verify target selection.

DEFICIENCY NO. D2.5-4

RESPONSE

Cause

PMM-152 is unique in that it provides overall project direction on a complex technical evaluation process. The original issue of the PMM was prepared before any experience had been gained in execution of many aspects of the program, and it was expected that further revisions would be required to improve and refine the procedure. Certain requirements were inadvertently omitted from the early issues, as stated in the finding, and a series of revisions were necessary as the program was developed.

Extent of Condition

The problem is confined to the program defined by the referenced PMM due to the unique circumstances as stated in Cause above. Within this program, the deficiencies cited involve work done in the early months of the program while it was still in a developmental stage.

Action to Correct Existing Condition

Evaluations performed to the requirements of early revisions of PMM-152 have been revised to meet all current requirements.

Action to Prevent Recurrence

PMM-152 has been revised.

DEFICIENCY NO. D2.5-5

RESPONSE

Refer to the response to Deficiency No. D2.5-4, except for the additional information under Action to Correct Existing Condition below.

Action to Correct Existing Condition

PMM-152, Revision 3, dated June 12, 1984, required checking of the HELB evaluations and included guidance for the HELB coordinator and system engineers for the review of unacceptable target status as follows:

1. Definitions of safe/shutdown, containment isolation, environment, and structural integrity.

2. A legend that identifies approximately 20 system or item conditions based upon GE criteria and HELB locations in order to have items reviewed to criteria that are not overconservative.

The HELB evaluations performed under Revision 2 were redone to include the requirements and guidance provided in Revision 3. The results were included in the preliminary HELB evaluation report dated August 5, 1984.

DEFICIENCY NO. D2.5-6

RESPONSE

Refer to the response to Deficiency No. D2.5-4.

DEFICIENCY NO. D2.5-7

RESPONSE

The packages identified in Deficiency No. D2.5-7, which summarized the target information for system consequence evaluation, were preliminary information, neither intended for nor used for any final design process. This information was informally transmitted among the groups involved for the purpose of evaluating the interface and communication methods among the groups and to eventually establish a detailed procedure to be included in PMM-152. Based on the review of these informal transmittals, a procedure for interface and documentation has since been included in PMM-152, and the information in the packages identified has been retransmitted by means of controlled documents in accordance with PMM-152, to be used for design purposes.

Based on the above, we do not agree that this constitutes a deficiency in the control of the flow of design information between organizations.

DEFICIENCY NO. D2.7-1

RESPONSE 1

Cause

Timely review of the interim problem report (IPR) was not performed because the IPR was inadvertently routed to the wrong lead engineer by the on-project IPR coordinator. This IPR was located, routed to the correct lead engineer, and responded to during the course of the inspection.

Extent of Condition

This is an isolated case. The on-project IPR distribution system was reviewed, and it was determined that all IPRs are being forwarded to the correct lead engineers, including distribution to multiple lead engineers when appropriate.

Action to Correct Existing Condition

No additional corrective action is needed relative to the IPR distribution system.

Action to Prevent Recurrence

No specific action to prevent recurrence is required. The on-project IPR coordinator is aware of the need to distribute all IPRs to the correct lead engineers.

RESPONSE 2

We do not concur with the portions of Deficiency No. D2.7-1 which in essence state that the evaluations performed in response to NRC IE Information Notice 83-26 were inadequate.

The information included in IE Information Notice 83-26 and INPO Significant Event Report No. 16-83 (both of which were included in SWEC Interim Problem Report No. 50978) contained several significant items.

1. For all the events reported, none indicated that the ability to maintain the reactor in a safe condition was ever compromised.

2. Two of the plants were able to initiate a normal cooldown, indicating that steam leakage was not severe.

3. None of the plants indicated damage to other equipment as a result of the steam leakage.

4. All the problems were associated with failure to achieve tight shutoff; thus there was no indication that the vacuum breaking function was ever jeopardized.

5. Where specific information was provided, it pointed to problems associated with hinge pin size and materials and bearing materials.

Had any of the reported events indicated a more severe failure (e.g., other equipment damaged, vacuum breaking capability compromised, safe shutdown capability compromised), a more indepth evaluation would have been performed. However, since this was not the case, SWEC and GSU proceeded to evaluate the applicability of the defined hinge pin and bearing problems.

Both General Precision Engineering (GPE) and Anderson Greenwood valves, which had experienced problems, were evaluated.

The 10-in., 300-psi GPE valves were modified to increase the hinge pin diameter from 5/16 in. to 1/2 in., and both the hinge pin and bearing materials were changed to a less soft material (e.g., 416 stainless steel bearing material).

Both 6-in. and 8-in., 300-psi Anderson Greenwood valves with 7/16-in. diameter hinge pins were modified to replace the hinge pins and bearings with A654 (630 stainless steel) pins and bearings.

For the three modifications identified above, the respective utilities which implemented the modifications reported that no subsequent failures were experienced.

Although no operating experience yet exists for such application of the 10-in., 300-psi Anderson Greenwood valve, this valve uses a 9/16-in. diameter hinge pin and A654 hinge pin and bearings.

Since the 10-in., 600-psi Velan valves used at River Bend contain 3/4-in. diameter hinge pins, use A654 as the hinge pin material, and have stellite bearings, we believe that these valves are equal to, if not better than, the modified Anderson Greenwood and GPE valves, which have operated successfully.

We believe that the actions taken to arrive at this conclusion constituted an adequate response to IE Information Notice 83-26.

NOTE: The Velan vacuum breakers are designed, analyzed, fabricated, and installed to the requirements of ASME III and will be subjected to the inservice inspection requirements of ASME XI.

DEFICIENCY NO. D2.7-2

RESPONSE 1 - GSU

Cause

GSU procedures in effect require that all incoming NRC correspondence be handled formally and that actions taken be documented. When the existing procedures were implemented, GSU chose not to retrofit all past correspondence received which had been distributed in accordance with procedures then in effect.

Extent of Condition

The condition is limited to those bulletins that GSU was not sent for information or response by the NRC.

Action to Correct Existing Condition

IE Bulletin 80-01 was distributed for review in accordance with GSU procedures (RBP 4.1).

Action to Prevent Recurrence

No action is required. GSU procedures in effect since 1982 require that documents received from the NRC be routed for response, action, or information, as determined to be appropriate. GSU has obtained and distributed those bulletins which were never sent to GSU for information or response by the NRC.

RESPONSE 2 - SWEC

Cause

Timely review of the interim problem report (IPR) which addressed IE Bulletin 80-01 was not performed because the IPR was apparently not distributed to the appropriate on-project lead engineer by the on-project IPR coordinator. This bulletin was received as a "no response required" IPR and our procedures did not require an acknowledgement or other response from the cognizant lead engineer.

Extent of Condition

This is an isolated case. The on-project IPR distribution system was reviewed, and it was determined that all IPRs are being forwarded to the lead engineers, including those which are received as "information only" items.

Action to Correct Existing Condition

No additional corrective action is needed relative to the IPR distribution system.

IE Bulletin 80-01 highlights the need to provide leaktight check valves and to periodically verify such leaktightness. The need for leakage criteria for the check valves is addressed in the response to Deficiency No. D2.4-6.

SWEC will notify GSU by letter of the need to perform periodic tests to verify leaktightness of the automatic depressurization system air accumulator subsystems so that the appropriate procedures will be included in the preoperational and operational testing programs.

Action to Prevent Recurrence

No specific action to prevent recurrence is required. The on-project IPR coordinator is aware of the need to distribute all IPRs to lead engineers, and this is identified in River Bend Project Procedure RBP 6.2-0.

DEFICIENCY NO. D3.3-1

RESPONSE

Cause

The ball joints are a unique piece of equipment with unique data requirements relative to stress analysis of associated piping. The condition noted stems from a failure of the power engineer to realize all of the parameters for ball joints which would be needed by the pipe stress analyst.

Extent of Condition

As part of River Bend Project Procedure RBP 6.24, a standardized format was established to define the type of information to be provided to Pipe Stress by power engineers to ensure that all needed parameters are provided. The ball joints are unique in requiring an additional parameter not included in RBP 6.24; therefore this is a random deficiency.

Action to Correct Existing Condition

A power input controlled listing (PICL) has been issued in accordance with River Bend Project Procedure RPB 6.24, which includes the information regarding flexural range (7.5 deg) and installation tolerance (2.5 deg). The resulting 5-deg rotation limit will be included in the final stress analysis for the affected lines.

Action to Prevent Recurrence

Due to the unique nature of this condition, no specific preventive action is considered necessary.

DEFICIENCY NO. D3.3-2

RESPONSE

Cause

The pipe stress analysis cited in the deficiency was performed using an assumed weight (of 450 lb) for the flowmeter. The assumption was listed in the calculation but was inadvertently not identified as requiring confirmation.

Extent of Condition

It is not necessary to assess further the extent of this condition because the project program for final verification of safety-related piping systems includes review/confirmation of assumptions in pipe stress analyses (refer to River Bend Procedure RBP 18.13, Attachment D).

Action to Correct Existing Condition

The as-built verification of Stress Package AX-71AE is currently underway, and the weight of the flowmeter will be verified. Assumptions will be confirmed during the as-built verification process.

Action to Prevent Recurrence

Although the project has begun as-built verification of stress analyses, the lead engineering mechanics engineer will issue a memorandum to all stress engineers to reinforce the procedural requirement that "all assumptions requiring confirmation be highlighted in the calculations."

DEFICIENCY NO. D3.3-3

RESPONSE

Cause

Usually valve nozzle loads, unlike equipment nozzle loads, do not require any special consideration by the pipe stress engineers. For this reason, the allowable load limits on the safety relief valve flanges (synonymous with nozzle loads on safety relief valves) listed in Reference 3 were overlooked, and the interface limits were not addressed by the stress engineer.

Extent of Condition

The condition is limited to the four main steam loops only, since other valve nozzle loads do not require special interface consideration.

Action to Correct Existing Condition

Supplemental stress analysis on a typical safety relief valve line was performed, and resulting safety relief valve flange loads were transmitted to GE. GE responded that the referenced loads were acceptable (reference GE Letter No. GSS-4235 dated August 15, 1984), and GE's main steam stress report (which was received in late August 1984) also confirmed the same. Based on this, it was decided to defer the formal documentation of all SRV lines until the as-built verification process for cost-effective reasons.

Action to Prevent Recurrence

No preventive action is required, since the finding is specific to the four main steam lines, which are covered by the corrective action shown above.

DEFICIENCY NO. D3.3-4

RESPONSE

Cause

The identification numbers of two valves (cited in this deficiency) were erroneously interchanged in the transmittal forwarding valve accelerations to the Equipment Qualification Section.

Extent of Condition

As noted in the IDI report, this appeared to be a random error confined to this specific instance.

Action to Correct Existing Condition

Corrected valve identification numbers and corresponding accelerations were transmitted to the Equipment Qualification Group by means of Interoffice Correspondence DEM-P-3595.

Action to Prevent Recurrence

Since this is an isolated error in an analysis which is subject to as-built verification, no preventive action is necessary.

DEFICIENCY NO. D3.4-1

RESPONSE

We do not agree that the cited condition constitutes a deficiency for the following reasons:

1. CHOC Engineering Mechanics Division Memorandum (EMDM) No.81-08 (Reference 1 listed in the deficiency) was intended for valves with extended structures such as motor-operated valves (MOVs) or air-operated valves (AOVs) and is not applicable to the safety/relief valves, which have a boxy configuration and are not considered as extended structures. Therefore, the present method of using the combined center of gravity with proper offset is an adequate modeling technique in the case of the safety/relief valves.

2. Qualification of main steam isolation valves supplied by GE (with extended structure) is within the GE scope of responsibility. Rigorous application of the valve modeling procedure (Reference 1) has a dual purpose:

   a. To calculate the valve accelerations at the center of gravity of the operator and the center of gravity of the valve body required for the qualification of the valve.

   b. To account for the mass offset effect when calculating the stresses in piping near the valve.

   SWEC analysis was performed primarily to satisfy the stress requirements in the piping within SWEC's scope (piping downstream of the second main steam isolation valve). For this purpose, modeling the combined center of gravity of the valve body and the operator, with proper offset (as modeled by SWEC), is adequate, and compliance with Reference 1 (intended for valve qualification) is not necessary.

   However, since the main steam analysis (for piping within SWEC scope) had to be updated to incorporate the latest fluid transient information and building settlement loads, it was decided to remodel the subject main steam isolation valves in accordance with Reference 1, as mentioned in the cited condition description under POST CUTOFF WORK.

   NOTE: Reference 1 listed in the deficiency should be CHOC-EMDM-81-08.

DEFICIENCY NO. D3.4-2

RESPONSE

Cause

1. Due to an oversight by the pipe stress engineer, the weight of the ball joint was not flagged for confirmation in the stress calculation.

2. The error in the location of the ball joint (in the analysis) was caused by the method employed to simplify the mathematical model at that time.

3. Failure to accurately model the ball joints can be attributed to a failure by the pipe stress analyst to consider the unique difference between ball joints and other more conventional components which are frequently encountered in modeling.

Extent of Condition

For Condition 1, instances may exist in other calculations where calculations are not always marked with appropriate confirmation requirements. Conditions 2 and 3 apply to ball joints of all 16 safety relief valve discharge lines. No other ball joints are used in the River Bend design.

Action to Correct Existing Condition

1. The power input controlled listing (PICL) references the official document showing a 260-lb (not including the flanges) weight for the ball joint. This weight will be used in the revised analysis. During stress reconciliation, inputs to all stress calculations will be confirmed.

2. A revised model giving correct locations of the centers of the ball joints will be used for proper mathematical modeling.

3. Adequate engineering consideration will be exercised in the revised analysis where the nonlinear behavior of the ball joints is analyzed step by step, showing a breakaway moment of 6,500 ft-lb for all ball joints, and a set of equivalent stiffness of the ball joints is found. This elastic-plastic method establishes ways of bounding the combined loadings and deflections.

A revised analysis (a supplemental calculation) employing the above-mentioned corrective actions has been completed on a typical safety relief valve line off main steam loop C. The stresses in piping and total rotation of ball joints for proper loading combinations are within allowable limits and require no hardware modifications.

Based on this, the formal documentation of revised analysis on all safety relief lines will be incorporated during the as-built verification process.

Action to Prevent Recurrence

The lead engineering mechanics engineer will provide instruction in writing to stress engineers emphasizing confirmation of inputs to stress analysis even though procedures covering stress reconciliation address this requirement.

DEFICIENCY NO. D3.4-3

RESPONSE

Cause

Stress Calculation No. AX-71AE-2 calls for an anchor (common with AX-71AF) at node 200 to be at el 87.5 ft. Subsequent to the issuance of this calculation, the other contributing stress problem AX-71AF was worked on. In the process of making space in reservation for the referenced common anchor, an adjustment in the elevation of the anchor (to el 91 ft 0 in.) was necessary, and thus the controlled BZ drawing (for pipe support detail), EZ drawing (for general arrangement), and stress problem AX-71AF all specified el 91 ft 0 in. for the anchor. Stress Calculation No. AX-72AE-2 was reviewed in light of this elevation change. Since there was no technical impact, as a cost-effective measure, it was decided to mark up the working copy of AX-71AE-2 with this change and not reissue the calculation. A future revision of Calculation No. AX-71AE-2 would then incorporate this change either before or during as-built review. Therefore, a discrepancy exists in the elevation of the same common anchor among the various documents listed above.

Extent of Condition

As stated in the deficiency, this condition is random based on the unique considerations as explained in the Cause section.

Action to Correct Existing Condition

Support location is one of the attributes to be reviewed in the as-built verification process and is in progress at this time for stress package AX-71AE. The actual as-built elevation of the subject anchor will be compared to the elevation listed in the AX and used in the final reconciliation of the AX. Therefore, no further action to incorporate the el 91 ft 0 in. in AX-71AE will be taken prior to the as-built issue of the AX.

Action to Prevent Recurrence

Since this discrepancy was noted during normal review of the stress calculations, although a conscious decision was made not to reissue the calculation at that time, no preventive action is necessary.

DEFICIENCY NO. D3.4-4

RESPONSE

We do not agree that the exclusion of structural beams from the pipe support stiffness calculation constitutes a deficiency.

It is the current industry practice to use infinite (rigid) stiffness values, elastically calculated stiffness values, or generically assigned stiffness values for pipe stress analysis. These stiffness values, in general, are greater than the actual stiffness, in that such values do not fully account for all flexibility inherent in the pipe supports and do not account for gaps, clearances, structural steel flexibility, and material nonlinearities.

The use of higher than actual stiffness values generally overpredicts pipe stress values and pipe support loads due to thermal growth and differential movements; however, pipe stress and support loads due to seismic inertia effects cannot be precisely predicted due to the characteristic of the driving force and the dynamic characteristics of a particular piping problem. To account for inaccuracies in predicting inertia effects, safe design is made by using conservative input load definition, conservative load combinations, low damping values, and the reserve margins resulting from stiff support assumptions in the thermal growth and anchor movements analyses.

Furthermore, inclusion of the structural beam flexibility does not provide more precise or rigorous analytical results. Present state-of-the-art analytical methods cannot fully account for all stiffness and mass effects associated with the structural beam to which the pipe supports were attached. We consider the design procedure adequate and appropriate for pipe stress analysis and pipe support design. Such a procedure has been accepted by the NRC in the past.

DEFICIENCY NO. D3.4-5

RESPONSE

Cause

Based upon the limited extent of 8-in. piping in the cited stress package compared to piping above 12 in., the pipe stress engineer used a damping value corresponding to that for piping above 12 in. throughout, which is, for this case, technically justifiable. However, considering it a matter of engineering judgment, he failed to document his technical basis for taking this approach.

Extent of Condition

All Class 1, 2, and 3 pipe stress problems involving mixed piping sizes (12 in. and below and above 12 in.) were reviewed. Out of a total of 37 such problems, 8 problems used a higher damping value, and the basis for the approach was not documented.

Action to Correct Existing Condition

1. Cited stress package AX-71P will be revised during the as-built verification process to include the basis/justification of the approach taken.

2. The remaining seven deficient calculations will be revised with a justifiable technical approach during as-built reconciliation of the associated stress packages.

Action to Prevent Recurrence

The lead engineering mechanics engineer will provide instructions to engineers to emphasize documenting the basis of judgments made and will refer to Engineering Mechanics Division Memorandum (EMDM) 83-05 covering this subject.

DEFICIENCY NO. D3.4-6

RESPONSE

Cause

The responsible pipe support engineers were not sufficiently aware of the requirements contained in the SWEC Engineering Mechanics Divison Memorandum (CHOC-EMDM-81-04).

Extent of Condition

The cited condition affects all stress analyses which include trapeze hangers.

Action to Correct Existing Condition

The portion of the piping system contained in AX-71C has been reanalyzed considering the mass of trapeze hangers. There were no changes in the results of the stress analysis. Other stress problems will be evaluated to determine the effect of the additional weight of trapeze hangers as part of the project as-built verification program.

Action to Prevent Recurrence

The principal pipe stress engineer reemphasized to the Pipe Support Group in writing the requirements of CHOC-EMDM-81-04 prior to the integrated design inspection.

DEFICIENCY NO. D3.4-7

RESPONSE

We do not agree that this item constitutes a deficiency. The need to evaluate functional capability is evidenced by the fact that Engineering Mechanics technical guidance was provided on this subject (EMTP-12.9.12), as stated in the deficiency. Due to other priorities within the engineering mechanics discipline and the unavailability of all pertinent information (e.g., final system operating conditions, including all fluid transients, as-installed locations, etc) in early stage of the project, it was decided to defer the systematic evaluation of functional capability until just prior to or during final verification (stress reconciliation) for each stress problem. The interoffice memorandum referenced in the deficiency outlines this plan, which was in place as of April 13, 1984, before the Integrated Design Team raised this issue on May 1, 1984.

The as-built stress analysis verification process is currently in progress and functional capability is being evaluated as committed in FSAR Section 3.9.1.4.2A.4.

NOTE: The date of the interoffice correspondence noted under POST CUTOFF WORK should be April 13, 1984.

DEFICIENCY NO. D3.4-8

RESPONSE

Cause

Failure to incorporate E&DCRs via a drawing revision within the time and/or number limitations which existed at the time was due to the existence of other work of higher priority to which available manpower was dedicated. Since issued E&DCRs represent approved change documents, this incorporation delay had no impact on design adequacy.

We do not agree, however, that the use of a memorandum by the Project Engineer to authorize exceptions to a procedural requirement is a deficiency. In accordance with EAP 6.5, Section 4.2.3, the Project Engineer has the responsibility to establish rules for the incorporation of E&DCRs. These rules are stated in RBP 12.0. Due to special circumstances which may arise, it may be necessary to establish exceptions to these rules. Provided that these exceptions are justified and identified in writing on a case-by-case basis to the Project Engineer, it is his prerogative to grant exceptions on a case-by-case basis regardless of whether the communications mechanism used has been described in the project procedure. The interoffice correspondence method of obtaining such concurrence need not be controlled, since no design information is being transmitted. This communications method is only authorizing an administrative exception. Issued E&DCRs represent approved change documents to be used in conjunction with the document/drawing against which they are written; hence incorporation rules have no effect on design adequacy. To alleviate any concerns, RBP 12.0 will be revised to delineate the requirement for requesting a deviation to the incorporation limits for E&DCRs.

Extent of Condition

At this time, the project requirements for incorporating E&DCRs into piping drawings are such that no action in this regard is presently required (refer to Attachment E to River Bend Project Procedure RPB 12.0-12).

Action to Correct Existing Condition

SWEC Drawing No. EP-71B was revised on October 24, 1983, to incorporate E&DCRs which had been issued prior to that time. Since no delinquencies in incorporating E&DCRs presently exist, in light of the current requirements for E&DCR incorporation, no further action is required.

Action to Prevent Recurrence

The requirements for incorporation of E&DCRs into piping drawings have been modified to reflect overall project conditions more realistically. No further action to prevent recurrence is needed.

DEFICIENCY NO. D3.4-9

RESPONSE

We do not agree that this item constitutes a deficiency. The underlying intent of River Bend Project Procedure RBP 6.14-0 is to provide a method for ensuring later retrievability for those memorandums which must be directly referenced in a SWEC-issued document (e.g., an interoffice correspondence which is referenced in a calculation).

As indicated in Section 2.0 of RBP 6.14-0, the preferred approach is to reference the appropriate source document (e.g., issued SWEC document, approved vendor drawing, etc). RBP 6.14-0 was not intended to apply to memorandums which:

1. Merely identify the appropriate source (which can be referenced instead of referencing a memorandum).

2. Reflect interfaces which could have been handled verbally or would have been adequately addressed during the review and signout process of a document.

All four IOCs (References 1 through 4 listed in Deviation 3.4-9) fall under Item 2, above, as follows:

1. Two of the IOCs were from Pipe Stress Engineering requesting hardware changes deemed necessary to satisfy code stress analysis requirements.

2. One IOC was from Pipe Stress Engineering requesting an area to be placed on hold due to lack of available information regarding equipment allowable nozzle loadings.

3. One IOC was from Power Engineering indicating that globe valves would be substituted for gate valves in a one-time only type of situation.

In all four cases, these IOCs represent requests to change existing issued piping drawings. In such cases the preferred source document to be referenced in lieu of an IOC would be an E&DCR, since an E&DCR formally approves changes. In all four cases, E&DCRs were issued. Thus, the need never existed for these IOCs to be referenced in lieu of a preferred source document, and therefore, these IOCs did not have to be processed in accordance with RBP 6.14.

RBP 6.14 has been revised to clarify the intent of the procedure to preclude misunderstandings.

DEFICIENCY NO. D3.5-1

RESPONSE

Cause

The cause of the cited condition was a drafting error. The dimension was inadvertently omitted during incorporation of an engineering and design coordination report (E&DCR).

Please note that the SWEC drawing number referenced in the deficiency should be Drawing No. 1-BZ-71MV-CD.

Extent of Condition

This condition occurred on 1 of 34 drawings reviewed; therefore, as stated in the IDI report, it is considered to be a random deficiency.

Action to Correct Existing Condition

A construction revision notice (CRN) was issued to add the missing dimension to the reference drawing.

Action to Prevent Recurrence

No action is required, since this instance is considered a random deficiency.

DEFICIENCY NO. D3.5-2

RESPONSE

Cause

The deficiency was caused by an oversight during the drawing review cycle.

Extent of Condition

Based on a review of a sample of other drawings, this is an isolated condition.

Action to Correct Existing Condition

1. Calculation No. PX-5011 will justify the referenced span length.
2. The FSAR will be amended to allow for extended span lengths through the use of CHOC-EMDM-84-03 or by special analysis.

Action to Prevent Recurrence

Since this is considered to be an isolated condition, no specific remedial action is required.

DEFICIENCY NO. D3.5-3

RESPONSE

The decoupling criteria stated in Section 3.7.3.4.1A of the FSAR was intended to apply to the interface between the supporting structure and the component support. This criteria has been satisfied in all SWEC component support designs, including the RHR heat exchanger support. The terminology used to described the decoupling criteria, as currently stated in the FSAR, can be misinterpreted; therefore, the FSAR will be clarified. We do not believe this constitutes a deficiency.

Cause

Due to an oversight on the part of the preparer of the cited calculation, the natural frequency was not computed for the RHR heat exchanger support to demonstrate that it was in the rigid range.

Extent of Condition

This condition is an isolated case.

Action to Correct Existing Condition

The frequency of the RHR heat exchanger support has been computed and found to be within the rigid range. This computation will be documented in a revision to Calculation No. 221.900-HBA1699.

Action to Prevent Recurrence

Preventive action is not necessary because this is an isolated case. It is SWEC's standard practice to design all component supports such that their natural frequencies will fall within the rigid range.

DEFICIENCY NO. D3.6-1

RESPONSE

Cause

This condition was caused by a failure to realize during the processing of later addenda to SWEC Specification No. 228.211 that an earlier addendum to this specification had upgraded the ASME III code revision to include the Summer 1974 addenda. This resulted in an omission error on the title pages of the later addenda to SWEC Specification No. 228.211. However, the body of the specification was correct throughout this period, and since the vendor requirements are given in the body of the specification, the requirements imposed on River Bend Station valves covered by this specification were not incorrect at any time.

Extent of Condition

Other ASME III valve specifications were reviewed for this potential problem. No other cases were discovered; therefore this is considered to be isolated to SWEC Specification No. 228.211.

Action to Correct Existing Condition

Addendum No. 3 to SWEC specification invoked the Summer 1974 addenda to ASME III for the first time, which was correctly shown on the title page. E&DCR No. P-12,822 was issued on May 2, 1984, to correct the title pages of the later addenda to SWEC Specification No. 228.211. No further action is required.

Action to Prevent Recurrence

Since this case is limited to one specification, and since changing ASME III code versions is an extremely infrequent event, no specific action is needed to prevent recurrence.

DEFICIENCY NO. D3.6-2

RESPONSE

Cause

Breakaway Moment

Not requiring a specific test to verify breakaway moment stems from a failure to realize the significance of the breakaway moment in the associated pipe stress analysis.

Vendor Reports

The problems associated with vendor reports are due to failures to:

1. Document reasons for accepting test reports which do not clearly meet or exceed the specification requirements at the time the reports were reviewed.

2. Modify the specification to reflect agreed-upon changes regarding the need to submit reports for formal SWEC approval.

Specialist

The ball joints were procured, as a piping component, and the procurement specification was reviewed by the piping specialist.

Extent of Condition

At River Bend ball joints are used only in the main steam safety relief valve discharge lines. Many of the vendor tests required are unique relative to the types of tests normally required for safety-related piping system components. It is believed the problems identified with the vendor documents are limited to those associated with the ball joints. However, an additional 20 vendor documents for other safety-related piping type components (e.g., pumps, valves) will be selected at random and rereviewed to ensure that they comply with their associated specification requirements. Additional action, if required, will be addressed at that time, if any problems are found. A supplemental response will be submitted at completion of this review.

Action to Correct Existing Condition

Breakaway Moment

The ball joint vendor has been contacted regarding backup documentation to provide increased assurance that the stated breakaway moment will be realized in actual in-plant conditions.

SWEC will propose to GSU an approach to provide such additional assurance which will consider the relative merits of:

1. Performing a test on an actual 10-in. joint.

2. Expanded stress analysis to demonstrate the acceptance of a wider range of breakaway moments.

3. Periodic in-plant testing to confirm actual breakaway moments.

A supplemental response will be submitted which provides details of the programs selected.

Vendor Reports

The submitted vendor test reports will be rereviewed. The rationale for any variances from the specified requirements will be documented. In addition, should any changes other than those made to the specification by means of E&DCR No. P-12,830 be necessary, they will be made.

Also, References 8, 9, and 10 as listed in Deficiency No. D3.6-2 will be rereviewed to ensure that the specification is correct or is corrected, as applicable.

Action to Prevent Recurrence

Breakaway Moment

Due to the unique nature of the ball joints and their unique application in the River Bend Station design, no specific action is needed to prevent recurrence. There are no other ball joints in the station.

Vendor Reports

Nearly all the vendor reports required for River Bend Station have already been received and processed. However, the lead power engineer will issue a memorandum to all River Bend Project power engineers reminding them of the need to:

1. Provide suitable backup documentation whenever a deviation to a specification requirement is deemed justifiable.

2. Issue an approved change to the specification promptly when an agreement has been made to change the requirements of the specification.

DEFICIENCY NO. D4.3-1

RESPONSE

Cause

This condition was caused by an oversight on the part of the calculation preparer.

Extent of Condition

This information was available in the calculations for other River Bend buildings; therefore, the cited condition appears to be an isolated occurrence.

Action to Correct Existing Condition

The calculation will be revised to include the computer runs.

Action to Prevent Recurrence

No preventive action is required, since this is an isolated case.

DEFICIENCY NO. D4.3-2

RESPONSE

Cause

Concrete strength for the drywell above El 90 ft 0 in. was revised from 3000 psi to 4000 psi in July 1980. At that time, a decision was made by the supervisor not to revise the stiffness properties and subsequent seismic analysis of the reactor building structures because it would have a negligible effect on the results.

Later, in the fall of 1981, the seismic analysis of the reactor building was revised to include concrete fill between the containment and the shield building. Previously computed stiffness properties were not revised at that time because of the negligible effect of the concrete strength change. This decision was, however, not documented.

Extent of Condition

The deficiency is not systematic as described in the report.

Action to Correct Existing Condition

Revise calculations to document the decision not to revise the stiffness properties.

Action to Prevent Recurrence

Since all seismic designs are complete, no preventive action is required.

DEFICIENCY NO. D4.3-3

RESPONSE

We do not agree with the deficiency described in this item. All modes of vibration, including torsion and rocking, are considered in generating the acceleration time-histories at the center of mass at each floor, as stated in RBS FSAR Section 3.7.2.5A.

Responses at the center of mass of each floor are calculated from a three-dimensional lumped mass model using the time-history method in accordance with NRC SRP 3.7.2. It is recognized that the torsional and rocking accelerations can produce horizontal and vertical accelerations respectively at points away from the center of mass. These accelerations could be added algebraically to the horizontal and vertical accelerations at the center of mass to produce a unique acceleration time-history at each point on the floor. This refinement in the present procedure is not warranted because the response at the center of mass is a very conservative estimate of the overall building response as shown below:

1. The artificial earthquake time-history used as input ground motion has a response spectra that envelops Regulatory Guide 1.60 spectra and has significant amplifications over a broad frequency range. Actual earthquakes are more narrow-banded and would produce lower responses for the same peak ground accelerations than the design spectra.

2. Damping values for structures, soil, and systems used in the analysis are in accordance with Regulatory Guide 1.61 and are significantly lower than the damping values recommended in NUREG/CR-1161.

Additionally, the procedure used in the analysis of systems and equipment to consider the effects of ARS is conservative. Therefore, the present method of developing ARS used in the qualification of systems and equipment, when considered within the context of the whole methodology, beginning with site seismicity and ending with the evaluations of systems and equipment, represents a conservative design process sufficient to assure the safety of systems and equipment.

DEFICIENCY NO. D4.3-4

RESPONSE

We do not agree with the deficiency described in this item. The modeling technique used on River Bend to determine responses of structures, systems, and equipment during a seismic event provides conservative results and adequate assurance for analyses and design of systems and equipment. This modeling technique accounts for possible variations in amplified response spectra (ARS) at different locations during a seismic event. ARS are generated at the centers of masses in a lumped mass model to represent the responses for equipment and floor designs.

ARS are derived from a three-dimensional time-history analysis of structures. Structural response is based on a lumped-mass model in which floors are represented by rigid masses with six assigned degrees of freedom. These lumped masses are constrained by stiffness matrices which account for eccentricities between centers of mass and stiffness in each horizontal and vertical direction. The input ground motion conforms to NRC Regulatory Guide 1.60 requirements, while structural and system damping values are in accordance with Regulatory Guide 1.61. Both the input ground motion and the damping values are conservatively chosen to provide assurance of integrity of structures and systems.

Additionally, examination of typical River Bend ARS curves for seismic events shows that the rigid range is at or above 10 Hz; i.e., there is no amplification beyond the frequency of 10 Hz. All floors in Category I buildings have natural frequencies, both horizontal and vertical, above 10 Hz. Therefore, no variation of accelerations along the floor is expected.

DEFICIENCY NO. D4.4-1

RESPONSE

We do not agree that this finding is a deficiency. The original calculations for the drywell structure were performed based on a compressive concrete strength of 3,000 psi above el 93 ft 0 in. Later, to achieve drywell liner anchor capacity, 4,000 psi was determined to be required. The specific calculations for liner anchors were developed using a compressive strength of concrete of 4,000 psi above el 90 ft 3 in. The remaining drywell concrete calculations are considered to be conservative because they were based on a lower concrete strength and, therefore, do not require revision. The drawings and the design criteria were modified to reflect the maximum strength required for the concrete.

Action to Prevent Recurrence

Since the seven deficient pages were prepared by another engineering discipline whose procedures did not require signing every calculation page, preventive action is not required. The requirement for reviewing other structural calculations during the load verification effort for the condition described in Item 2 will be included in the applicable project instructions.

DEFICIENCY NO. D4.4-2

RESPONSE

Cause

Three calculations are involved in this review. The specific calculations have the following conditions:

1. Calculation No. 201.120-048, Revision 0, Weir Wall Design.

   There are four reviewers for this calculation. The title page has three reviewers' signatures, and one reviewer's name was printed because he no longer was employed by SWEC. However, the individual pages were initialed by the reviewers, which provided traceability to the reviewer of each page. We do not believe this constitutes a deficiency.

2. Calculation No. 201.120-070, Design of Reactor Pressure Vessel Pedestal - Supplementary Calculations.

   There are four reviewers for this calculation. All four reviewers' names are printed on the title page. Three of the reviewers were no longer employed by SWEC when the title page was prepared, and for consistency, the fourth name was also printed. A general note indicating reference to individual pages for traceability of reviewers was placed on the title page. The traceability to individual pages is provided by the reviewer's signature on each page. All except seven pages are signed by the reviewers. These seven pages were not signed by the reviewers because the calculations were performed according to procedure in 1979 and 1980 by another engineering discipline where the requirement to sign every page did not exist.

3. Calculation No. 201.120-068

   This calculation was in process at the time of the inspection. The project will ensure that all pages of this calculation are traceable to the respective reviewer. We do not believe this constitutes a deficiency.

Extent of Condition

The full extent of the condition described in Item 2 above will be determined during the structural load verification effort.

Action to Correct Existing Condition

The seven pages of Calculation No. 201.120-070 that were not signed by the original reviewer have been reviewed by another individual. The calculation has been revised to document this review. Additional calculations that were found to be deficient during the structural load verification effort will be corrected.

DEFICIENCY NO. D4.4-3

RESPONSE

Cause

The cause of this condition was an error made by the reinforcing steel detailer during preparation of the detail drawing referenced in the deficiency.

Extent of Condition

Due to the nature of this item (no impact on design) and the status of the reinforcing steel fabrication/installation effort (work complete), combined with the inspector's observation regarding extent (not systematic based on check of other drawings), a further evaluation of extent is unnecessary.

Action to Correct Existing Condition

No corrective action is required, since the incorrect reference had no impact on the fabrication of the reinforcing steel or on the design of the affected structures.

Action to Prevent Recurrence

Since this condition is not systematic, no preventive action is necessary.

DEFICIENCY NO. D4.4-4

RESPONSE

Cause

A typographical error was detected in Calculation No. 12210-201.120-068 in the typewritten introduction prepared in February 1984. In this introduction, a load combination reference is made with an incorrect factor of 1.7 instead of 1.6. This page was unchecked at the time of the inspection.

Extent of Condition

Based on a review of other calculations, this appears to be a limited condition. The body of the calculation, prepared prior to writing the summary introduction, uses correct factors.

Action to Correct Existing Condition

The introduction page has now been checked, and the error has been corrected.

Action to Prevent Recurrence

Since this is an isolated case, no further preventive action is required.

DEFICIENCY NO. D4.4-5

RESPONSE

Cause

1. The cause of the use of incorrect units (F° versus psi) was an error on the part of the preparer of the calculation. It should be noted that the error was made in the labeling of a figure included in the calculation to aid comprehension of the design conditions. The correct units were used in the computations.

2. Structural calculations are quite voluminous and, often during the preparation and checking process, pages are added and deleted from the calculation and moved from place to place within the calculation. In order to control the calculation pages during this period, preliminary page numbers are assigned. When the preparation and review process is complete, final page numbers are assigned.

   The cause of the cited condition (incorrect page reference) was an oversight by the preparer of the calculation, who did not remove the preliminary page reference (277) and replace it with the final page reference (180).

Extent of Condition

1. A sample of 200 pages was reviewed for a similar type of error on labeling a figure. In this sample, there were three locations where such a figure was used as a design aid. All three figures were found to be correctly labeled. Therefore, the cited deficiency is isolated.

2. Review of the sample of the calculation by the same preparer was conducted for revision to preliminary page number references of a sample of 200 pages reviewed. There were 48 pages referring to other page numbers. All references were correct. Hence, it is concluded that this is an isolated case.

Action to Correct Existing Condition

The cited calculation has been corrected by deleting the incorrect page reference and inserting the correct information.

Action to Prevent Recurrence

No action is required, since both conditions are isolated cases.

DEFICIENCY NO. D4.6-1

RESPONSE

Cause

This condition was caused by an interpretation by the design engineers involved of the ACI code requirements for anchorage of shear reinforcing.

Extent of Condition

The cited condition is limited to the concrete calculations associated with portions of the structures referenced in the deficiency.

Action to Correct Existing Condition

SWEC has revised the calculations to show that shear bars are not required in the shield building. No further action is required, since the anchorage used in the other structures referenced in the deficiency is considered acceptable (as stated in the deficiency).

Action to Prevent Recurrence

Since the design and construction of the reinforced concrete structures is essentially complete, no preventive action is required.

DEFICIENCY NO. D4.6-2

RESPONSE

Cause

1. The cited calculation is voluminous (360 pages) and was prepared by nine individuals over an extended period of time. The cover page of the calculation was prepared after the entire calculation was completed and checked. In summary, four preparers did not sign the page because they had left the project, one preparer's initials were placed on the cover page by his supervisor because the preparer (SKA) had left the project, two preparers' signatures do appear on the cover page, and two preparers did not sign the cover page due to an oversight.

2. The calculation referenced in the deficiency was prepared by several engineers. The preparer, whose initials were placed on the cover page by his supervisor, had been transferred to another position off-project at the time the various sections of the calculation in question were assembled and the cover page was prepared. Since the preparer was not available to sign the cover page, the placing of his initials was an attempt by the supervisor of the preparer to meet the intent of the requirement (i.e., identification of the preparer on the cover page).

3. The cause of this condition is an oversight by the reviewers.

4. The checker involved (SKA) is the same individual referenced in Item 2 above. As stated in Item 2, this individual was transferred to another position off-project prior to the time the cover page was prepared and signed. The supervisor who placed this individual's initials on the cover page as preparer failed to duplicate this entry in the "Reviewer" column on the calculation cover page.

Extent of Condition

1.&4. Since the work performed is traceable to the individuals who prepared or checked it, and since some individuals who were involved are no longer assigned to the project, a further assessment of extent is not warranted.

2. Due to the unusual nature of this item, SWEC believes that this condition does not warrant further assessment of extent.

3. The full extent of this condition will be determined during the structural load verification effort.

It should be noted that all required reviews were accomplished and that the deficiency relates only to the methods of documenting the review.

Action to Correct Existing Condition

1.&4. Since the work performed is traceable to the individuals who prepared or checked it, and since some individuals who were involved are no longer assigned to the project, no corrective action is planned.

2. Since the work performed is now traceable to the individual who checked the calculation (refer to Item 3), and since this individual is no longer assigned to the project, no further corrective action is planned.

3. All reviewers whose names do not appear on pages of Calculation No. 201.120-067 (Revision 0) have identified in writing those specific pages that they were responsible for reviewing. This information is documented in interoffice correspondence which have been filed with the original calculation. The correspondence has been signed by the reviewers.

   Other calculations found to be deficient during the structural load verification will be corrected by one of the following methods:

   a. If the reviewer is available, the pages reviewed will be identified in a written memorandum signed by the reviewer. The memorandum will be filed with the original calculation.

   b. If the reviewers are not available, the pages in question will be subjected to another review.

Action to Prevent Recurrence

The lead structural engineer will issue a memorandum reemphasizing to all calculation preparers and reviewers the requirements for placing their names on the cover page and other pages of calculations for which they are responsible.

DEFICIENCY NO. D4.7-1

RESPONSE

We disagree that this item constitutes a deficiency. In the reactor building mat, weirwall and drywell wall embedment plates have dowels welded at the bottom. SWEC drawings show 7-in. grout pockets for these plates.

After the reactor building mat concrete (4000-psi compressive strength) was placed, a SWEC nonconformance report identified locations where the 7-in. grout pocket depth was not maintained. Some locations had more than a 7-in. depth, while others had less than a 7-in depth. The original design conservatively assumed no development capacity for the grout depth and assumed development of the dowel lengths embedded in concrete only. Therefore, calculations were performed to determine the adequacy of embedment in concrete based on actual conditions reported by the above nonconformance report (i.e., less concrete depth due to increased depth of grout pocket). These calculations showed that development of the dowels in the areas of concern would be adequate if the concrete has a 5000-psi strength. The test results of concrete under areas of concern show a minimum of 5000-psi compressive strength.

The above is typical of construction condition deviations encountered at the jobsite. The reporting and disposition process for this nonconformance was in accordance with the River Bend Station Quality Assurance Program.

DEFICIENCY NO. D4.11-1

RESPONSE

Cause

Shear forces caused by the pump shaft casing moments were omitted from design calculations due to an oversight by the calculation preparer.

Extent of Condition

Since the auxiliary building mat with deep pump shafts is a unique design application, this deficiency is considered an isolated case.

Action to Correct Existing Condition

Calculations have been prepared to include shear forces due to pump shaft in the analysis of the auxiliary building foundation mat. There was no effect on the calculation results.

Action to Prevent Recurrence

Since this item is not systematic, no preventive action is required.

DEFICIENCY NO. D4.11-2

RESPONSE

Cause

In the analysis of the auxiliary building foundation mat, a shear check was not made at a distance of effective depth from the support point in accordance with Section 11.10 of the ACI 318 code. This check was not performed because the provisions of the code were considered unclear for the analysis of the foundation structure in question. Instead, the ASCE paper, which interpreted ACI 318 requirements for shear in deep mats was used.

Extent of Condition

Calculations for other safety-related structures' foundation mats were reviewed for compliance with the ACI code as above. It was found that all designs showed a check for shear at distance d/2 from the support. Therefore, this is considered to be an isolated case.

Action to Correct Existing Condition

As stated in the deficiency, SWEC has performed calculations checking shear in the mat using Section 11.10.1 of the ACI code. There was no change in calculation conclusions.

Action to Prevent Recurrence

Since the cited condition is an isolated case, no preventive action is required.

DEFICIENCY NO. D4.12-1

RESPONSE

Cause

Calculations were not prepared to support the need for the Nelson studs described in the deficiency because they were added for additional conservatism.

Extent of Condition

The Nelson studs were used for additional conservatism in the reactor building at el 114 ft 0 in. and 141 ft 0 in. on steel structural beams.

Action to Correct Existing Condition

Since design conditions for the beams in question did not require any studs, a note is added to the calculations indicating that the studs are added for additional conservatism.

Action to Prevent Recurrence

Since all construction work is complete, no additional application of studs similar to the one cited is expected. Therefore, no preventive action is required.

DEFICIENCY NO. D4.12-2

RESPONSE

We do not agree that this item represents a deficiency. The design engineer first evaluates all loading combinations qualitatively and eliminates those combinations which are enveloped by others (the preparer's decisions are confirmed by the reviewer). If the preparer is unable to determine the governing combination qualitatively, he performs a quantitative analysis, using all remaining combinations to determine maximum design loads. The governing loading combination for Calculation No. S53-500, Revision 1, was determined by quantitatively analyzing 3 loading contributions; for Calculation No. S53-500, Revision 0, 4 loading combinations; for Calculation No. 201-120-048, Revision 0, 15 loading combinations; and for Calculation No. 12210-210.720-068, Revision 0, one loading combination.

DEFICIENCY NO. D4.12-3

RESPONSE

We disagree with the conclusion that this item represents a deficiency. The slab is not supported by the structural angles. Angles are provided for preventing wet concrete during placement from seeping out between the beam web and the edge of the metal decking. The angles were added at the detail development stage of the design. There is no stress involved to warrant a calculation.

DEFICIENCY NO. D4.15-1

RESPONSE

Cause

In cable tray analysis, frequency calculations were checked by an alternate calculation. This alternate calculation showed reduction in frequency of the support from 49.6 Hz to 27.0 Hz. However, dynamic response remained unchanged. Therefore, the cause of the deficiency is the reviewer's use of judgment in accepting the original calculation even though the results of his alternate calculation varied.

Extent of Condition

In general, alternate calculations are not used for checking. Therefore, this deficiency appears to be an isolated case.

Action to Correct Existing Condition

The alternate calculations cited in the deficiency have been checked as required by SWEC Structural Technical Procedure 11.5.

Action to Prevent Recurrence

This is an isolated occurrence. Hence, no further action is required to prevent recurrence.

DEFICIENCY NO. D4.16-1

RESPONSE

Cause

Computer Program PIPERUPT was included in Appendix C to Design Analysis Outline SA-932-DAO because it was intended for use on the project. The PIPERUPT computer program was not used on the River Bend Project because the decision was made to use a manual calculation method; however, SA-932-DAO was never revised to indicate this change.

Extent of Condition

This item is an isolated case pertaining to the control rod drive system piping and only applies to the PIPERUPT computer program.

Action to Correct Existing Condition

The reference to the PIPERUPT computer program has been deleted from Appendix C of Design Analysis Outline SA-932-DAO. Appendix C, Revision 4, to the Design Analysis Outline was submitted to SWEC for approval on May 11, 1984, and was approved by SWEC on June 6, 1984.

Action to Prevent Recurrence

Reactor Controls, Inc. (RCI), project personnel will be instructed to place additional emphasis on the timely update and approval of the Design Analysis Outline to ensure that the analysis methods used are being defined accurately.

DEFICIENCY NO. D4.16-2

RESPONSE

Cause

Reactor Controls, Inc. (RCI), did not consider the task files to be a permanent plant record until the completion of the as-built reconciliation and, therefore, the task files were not being maintained as controlled documents.

Extent of Condition

The condition applies to all task files maintained by RCI.

Action to Correct Existing Condition

A copy of all task files, including computer runs, will be placed in Document Control. An additional copy of all task files and computer runs will be placed in a remote warehouse to provide dual storage and protection of records.

The original task files and computer runs will be maintained as a working document and controlled by the RCI Analysis Project Engineer or Senior Engineer at each project area by means of a formal signout system.

Every 6 months or at the completion of a project, whichever comes first, any task files and computer runs which have been revised will be copied and placed in Document Control and the remote warehouse. The obsolete task files and computer runs will be stamped obsolete and retained or destroyed. Copies may be hard copy, microfiche, or equivalent.

Action to Prevent Recurrence

All RCI personnel will be trained in the requirements of the system for the control of task files to ensure proper implementation. In particular, training will be provided to all RCI personnel on the requirements for design control in accordance with QAI-3-1.

DEFICIENCY NO. D4.16-3

RESPONSE

Cause

The dimension on the isometric in Document No. SA-932-DAO was based on unverified input. The isometric in the DAO was originally prepared for another similar project and was not verified to be applicable to River Bend Station.

Extent of Condition

Based upon the stress verification completed to date, this item appears to be an isolated case involving only Task SA-4835. Any other dimensional discrepancies will be identified and resolved as a result of the walkdown, as-built, and final stress reconciliation programs.

Action to Correct Existing Condition

The as-built dimensions on the isometric in Document No. SA-932-DAO were verified in the field and the document was subsequently revised prior to approval. However, the dimension on the math model isometric included in the task file (SA-4835, Sheet 1 of 1) was not immediately corrected. To determine if a problem existed, a sufficient number of other lines was evaluated (SA-2454 and SA-4832) to see whether an overstressed condition resulted.

After it was determined that an overstressed condition did not occur, the dimension in Task SA-4835 was corrected, and for traceability purposes, a statement to this effect was placed in all outside drywell insert line task file folders.

Action to Prevent Recurrence

Reactor Controls, Inc. (RCI), analysis personnel have been informed of the necessity to place additional emphasis on drawing and mathematical model comparison when task files are reviewed to assure that information contained is in agreement.

DEFICIENCY NO. 05.3-1

RESPONSE

We do not agree that a deficiency exits. Consistent with the manner of procurement, identification numbers given to the heaters included an asterisk (*), in the same manner as the MOV identification number. Class 1E power was furnished to the heaters that had Category I identification numbers. However, ongoing efforts by the SWEC Equipment Qualification Section in performing reviews of all qualification documents and components within Class 1E equipment identified this particular concern in December 1983 (IDI Reference 6). Upon identification by the project of this concern, SWEC immediately explored including the MOV heaters in the qualification test being conducted under the GE Phase 3 qualification program (IDI Reference 8). The intent was to use the results from this test program by applying them to the BOP Category I MOVs using Limitorque's Class 1E motor actuators. This approach could have successfully resolved the concern.

An alternate approach considered was to analyze the non-Class 1E heaters to establish that their malfunction would in no way adversely affect the operation of the MOV or other Class 1E devices powered from the same Class 1E panelboard.

The approach actually chosen by the project and discussed with the IDI was to deenergize the heaters during plant operation. A recommendation had been obtained from Limitorque Corporation on May 11, 1984, stating that the use of heaters is required during storage only. It was decided to determinate the heater circuits at their respective Class 1E power supply panelboards in order to comply with the RBS commitments to Regulatory Guide 1.75 and IEEE 384. An FSAR change is being made to address this issue in Table 8.3-7.

The ongoing qualification efforts, specifically review of qualification reports and individual components, will identify any similar existing discrepancies. By their identification and inclusion in SWEC's existing EQ tracking log we believe that this demonstrates that the EQ program is working.

DEFICIENCY NO. D5.4-1

RESPONSE

SWEC does not agree that the omission of EDVM-CHOC-83-18-1 from Calculation No. E-137 is a deficiency.

EDVM-CHOC-83-18-1 addresses protection of equipment and not cable sizing. Electrical Technical Guideline ETG-IV-4-1 addresses cable size selection and was properly referenced in the calculation.

ETG-IV-4-1 provides corporate direction for the selection of power cable conductor sizes. This ETG gives specific guidance in selecting cables for motor-operated valves based on ampacity; voltage drop, including starting voltage; and short-circuit considerations. EDVM-CHOC-83-18-1 is a CHOC-issued directive clarifying the selection of overcurrent protection for MOVs. For MOVs serving Class 1E applications with their thermal overloads bypassed during design basis accidents, the overload relay setting shall be 125 to 140 percent of the MOV FLA.

Valve motors are small, short-time rated, and specifically selected for the valves on which they are mounted. The thermal, acceleration, and torque characteristics are different than continuous duty motors. The locked rotor currents on this type of motor vary between 4 and 11 times the full load current*. During a design basis accident, the overload relay is bypassed, leaving the motor unprotected. The premise here is to expend all possible measures for the valve to operate to help mitigate the accident, even to the destruction of the motor, as referenced in Regulatory Guide 1.106, Thermal Overload Protection for Electric Motors on Motor Operated Valves. Under this condition, the feeder cable to the MOV may see LRA for an extended period if the valve operation is impeded. This will cause the cable conductor temperature to rise above its rating. Since MOV feeder cables are usually routed in K-Tray, this increased cable temperature could adversely affect the operation of other Class 1E circuits (cables) in the immediate proximity of the MOV feeder cable. In this extreme case, physical damage to adjacent cables may occur. By selecting the MOV feeder cable in accordance with ETG-IV-4-1, this adverse heating effect is eliminated. Studies indicate that under similar conditions, cables sized to ETG-IV-4-1 will produce a maximum conductor temperature of 103°C versus 142° to 213°C conductor temperature with cables sized to 140-percent FLA. A conductor temperature of 103°C is well within the 5-hour overload limits of the cable being used on the River Bend Station - Unit 1 Project.

*ETG-V-2-3, Selection of Motor Running Overcurrent and Locked Rotor Protection - AC and DC Motors

RESPONSE 2

Cause

The Gould document was incorrectly referred to as a GE document. The cause of the incorrect use of breaker curves for HE, HL, and LL circuit breakers rather than curves for circuit breaker A80 could not be clearly determined.

Extent of Condition

A review of similar calculations did not reveal additional examples of such conditions. Therefore, this is considered a random deficiency.

Action to Correct Existing Condition

Calculation No. E-137 has been revised and reissued to correct the cited condition with no changes in the calculation conclusion.

Action to Prevent Recurrence

Since this is a random deficiency, no specific action to prevent recurrence is necessary.

DEFICIENCY NO. D5.5-1

RESPONSE

Cause

The discrepancy was caused by the inadvertent omission of a rework control form (RCF), which is required when changes must be made to installations already signed and approved by FQC. A review shows that the cables in tray 1TK501B were properly installed, pulled into the termination cabinet 1RCP*TCR14A, and had their respective pull tickets verified and signed by FQC. An investigation indicates that a cable terminating crew found that they could not terminate cable 1RHSBBK017 because of insufficient cable slack; without an RCF or notification of FQC, the terminating crew untied the cable from the tray, rerouted the cable in free air, and completed its termination activities. This sequence resulted in an error in the ECSIS data base concerning the cable routing of the subject cable, and there was no inspection by FQC on this Category I cable rework.

Construction Site Instruction (CSI) 1.0.13 controls the use of the RCF (and explains that notification of FQC by Construction is acceptable instead of an RCF under certain circumstances). The CSI establishes a control program for the repair or alteration of a system, component, structure, or equipment which has been completed and accepted by FQC/CCCP installation inspection or released to the Preliminary Test Organization for preliminary testing or plant construction. Implementing the CSI procedure resulted in FQC reviewing the original inspection requirements to determine necessary verification inspections and ultimately performing the inspection of rework and documenting the results.

Extent of Condition

FQC performed a random inspection of 32 cables which were complete and signed off to determine if the cables were actually installed in their assigned raceways. The cables selected were terminated on both ends and included a minimum of three scheduled tray sections as a part of their routing. The results of this inspection indicate that all cables were installed in accordance with the approved routing. Therefore, this item is an isolated error in observing the guidance of CSI 1.0.13.

Action to Correct Existing Condition

Upon identification of the discrepancy, Unsatisfactory Inspection Report No. 4000837 dated May 16, 1984, was prepared to identify the problem and initiate corrective action. Corrective action was completed on May 21, 1984, and no further action is required.

Action to Prevent Recurrence

Since this condition is isolated, no preventive action is required.

DEFICIENCY NO. D5.8-1

RESPONSE

Contrary to the finding, SWEC correctly incorporated FDDR No. LDI-925, Revisions 0 and 1, into the SWEC file copies of GE elementaries, which SWEC entered into the manufacturer's drawing handling system (MDHS) on April 25, 1984. FDDR Revisions 0 and 1, incorporated on April 25, 1984, were both approved by GE-San Jose on February 16, 1984. SWEC correctly noted GE's FDDR comments on Division 1 and Associated Division 1 separation groups.

A deficiency appeared to exist because of confusion during the audit over the differences between GE-Site approved and GE-San Jose approved Revision 1 to FDDR No. LDI-925.

For example, Revision 1, as approved by GE-Site personnel on November 10, 1983, requires (page 37 of 42) a change from Division 1 to Associated Division 1 on a circuit in bay B of 1H13-P629. On the other hand, Revision 1, as approved by GE-San Jose on February 16, 1984, includes (page 37 of 46) a note stating "Don't Add" to the above change. Upon incorporation of GE-San Jose approved Revision 1, SWEC correctly did not change Division 1 to Associated Division 1.

It must be noted that FDDR No. LDI-925, Revision 1, as approved by only GE-Site personnel on November 10, 1983, was not the issue incorporated by SWEC.

Therefore, this issue is not considered a deficiency, and no corrective action is required.

DEFICIENCY NO. D5.8-2

RESPONSE

Cause

The cause of this deficiency and Deficiency No. D6.5-1 was an oversight.

Extent of Condition

Other analog wiring diagrams (AWDs) were reviewed, and no similar conditions were found, therefore, this condition is not systematic.

Action to Correct Existing Condition

The AWDs cited have been corrected.

Action to Prevent Recurrence

As stated in the IDI Report, and noted under Extent of Condition above, this type of deficiency does not appear to be systematic. Therefore, no specific preventive action is considered necessary.

DEFICIENCY NO. D5.8-3

RESPONSE

Cause

The deficiency consisting of inadvertent mismarking of minor design detail or poor printing of copy is considered the result of insufficient training in detail checking of field deviation disposition requests (FDDRs) by a newly assembled design engineering group.

Extent of Condition

Review of the subsequent increasing volume of FDDRs processed by the design group indicates the noted deficiency is not systematic.

Action to Correct Existing Condition

The deficiency was noted in implementation of changes, and the design detail was corrected by FDDR revision.

Action to Prevent Recurrence

Periodic training and FDDR problem review sessions, about twice monthly, were started in March 1984 and are continuing.

DEFICIENCY NO. D5.10-1

RESPONSE

Cause

The condition was caused by the incorrect assignment of equipment classification code on the GE LPCS system elementary diagram device list.

The drain line from the tap between the inner and outer reactor vessel head seals to the drywell equipment sump is designed with a flow restricter and two drain line shutoff valves. The downstream shutoff valve is normally closed.

The drain line is normally not pressurized, since the inner reactor vessel head seal constitutes the reactor pressure boundary. In the event of leakage through the boundary, the drain line is pressurized because of the normally closed valve. Pressure transmitter E21-N092 senses the pressure rise and sounds an alarm in the control room.

Quality group classification D is applied to the drain line, and this classification is carried through the flow restricter and drain line shutoff valves, as well as the instrument line, to the instrument rack, which is located in the containment, outside the drywell. This group classification is consistent with the requirements of GE BWR Requirement Document A61-1010 (F6TE9F2), Group Classification and Containment Isolation Diagram. The pressure transmitter is outside the scope of this requirement document and is classified as explained in the following paragraph.

Pressure transmitter E31-N092 obtains its electrical power from a trip unit, which is powered from an associated Division 1 power supply. Because of the power supply, the transmitter is given an equipment classification (EC) of P, which designates a passive item that is important to safety, as defined by GE Product Safety Standards, 22A8400, Appendix C. By these same product safety standards, this remote instrument is given a code classification (CC) of I (noncode). Coded pressure integrity is not required, since the instrument does not form part of a pressure boundary.

In the event of a dual failure (the failure of the inner head seal followed by a rupture of the group D line or the pressure transmitter), the resulting flow of reactor coolant to a drywell or containment floor drain is limited by the 1/4-in. flow restricter.

Section 4.3.4.1 of GE Design Specification No. 22A3137 is not applicable to transmitter E31-N092 because the transmitter is outside the pressure boundary. In accordance with the GE Product Safety Standard 22A8400, a Certificate of Conformance is required to confirm that GE purchase specification requirements are met. Material certification is not required. Quality assurance in accordance with 10CFR50, Appendix B, Seismic Category I, and environmental qualification requirements must be satisfied. Pressure integrity is not required.

Pressure transmitter E31-N092 is being environmentally qualified under the GE Phase III qualification program. It is a Class 1E transmitter.

The LPCS system elementary diagram device list, DL828E535AA, Sheet 9, Revision 10, incorrectly assigns an EC/CC classification of AI to this transmitter. This will be revised to read PI. The MPL designation of NI is correct by GE procedure.

Extent of Condition

The condition is applicable only to transmitters E31-N080A and E31-N092 and trip units E31-N680A, E31-N680E, and E31-N692.

Action to Correct Existing Condition

Drawing No. DL828E535AA, Sheet 9 will be revised. EC/CC classification of the five devices above will be changed from AI to PI.

Action to Prevent Recurrence

No action to prevent recurrence is warranted.

DEFICIENCY NO. D5.10-2

RESPONSE

The concern over conduit attachments to NEMA 4 enclosures resulted from observing a conduit installed inside the containment without special provisions for sealing, in contrast to the watertight characteristics of the NEMA 4 enclosure furnished by GE. The IDI team based its concern on Section 5.2.1 of GE Specification No. 22A6926, Equipment Environmental Interface Data. We do not agree that a deficiency exists for the following reasons:

Section 5.2.1 addresses conduit seal requirements for enclosures located inside containment (but outside the drywell) where containment sprays also exist. RBS has no containment spray, instead relying upon containment unit coolers. Hence, GE's specification provisions are not applicable to the observed installation.

The central issue revolves around the use of terminal blocks in these panels inside containment. Condensation accumulating on the surfaces of the terminal blocks, which can result from the harsh containment DBE environment, is known to cause leakage currents and thus degrade the electrical performance of terminal blocks. Enclosures installed in the containment are required by the electrical installation specification, Specification No. 248.000, to have pressure equalization holes drilled in their bottoms. The addition of these holes is intended to prevent collapse of an enclosure by a rapid pressure increase due to a DBA. These holes also allow the entrance of steam, regardless of how well sealed the conduit attachment is, thus reducing the effectiveness of the terminal blocks.

Activities of SWEC's Electrical Engineering and Equipment Qualification Section regarding the capabilities of terminal blocks had already indicated that their use inside containment was unacceptable. An effort was underway, prior to the IDI, to remove terminal blocks from applications inside containment and to replace those connections with Class 1E splices. SWEC drawings have been changed to indicate the use of Class 1E splices on Category I circuits (non-Class 1E splices on Category II and III circuits) rather than termination block connections. This action eliminates moisture as a concern for connections in containment within the subject GE enclosures.

Certain other Category I pieces of equipment may require environmentally qualified seals to protect their electrical connections. SWEC Drawing Nos. 12210-EE-450BA-1 and 450BB-1, issued April 30, 1984, identify those devices inside the containment that require sealing conduit connections for qualification reasons. These drawings also contain the details necessary to effect an environmentally qualified seal.

The ongoing qualification effort, including the identification of individual components and the review of their specific qualification documents, ensures that components requiring environmental sealing will be properly identified. Their inclusion on the EQ tracking log will ensure that corrective action is taken where needed. Upon completion of SWEC's qualification activities, RBS can be reasonably assured that devices will be environmentally sealed commensurate with their qualified design requirements.

DEFICIENCY NO. D5.10-3

RESPONSE

Cause

Qualification records did not demonstrate all relevant aspects of environmental qualification for in-containment applications.

Extent of Condition

The condition affects 11 local instrument racks located inside the containment.

Action to Correct Existing Condition

The affected field cables have been reterminated directly to the safety-related transmitters and bypass the CR151B terminal blocks.

Action to Prevent Recurrence

Because the field cables have been terminated directly, no further action is necessary.

DEFICIENCY NO. D5.11-1

RESPONSE

Cause

The cause of this problem was the inadvertent improper documentation of technically correct information obtained from the equipment manufacturer and its subsequent use by the engineer preparing Calculation Nos. E-149 and E-150.

Extent of Condition

A review of other calculations for this type of condition did not reveal any other instance where tel-con information was used. Therefore, this is not a systematic concern.

Action to Correct Existing Condition

Calculation Nos. E-149, Revision 3, and E-150, Revision 3, were both issued on May 5, 1984, after receipt of a copy of the battery discharge characteristics from the battery manufacturer, Gould. This information indicated that the batteries are properly sized and that no further action is required.

Action to Prevent Recurrence

Although this is not a systematic concern, the lead electrical/controls engineer will forward a memorandum to calculation preparers and reviewers reemphasizing the need for proper documentation and referencing of input data for calculations.

DEFICIENCY NO. D6.3-1

RESPONSE

Cause

The identified concern was an entry in the regulatory requirements and industrial standards (RR&IS) document which apparently prohibited GE Design Engineering from implementing certain regulatory guide requirements. This condition arose due to an internal GE audit, review, and verification of River Bend design documentation compliance with the contractually approved, authorized licensing requirements and the statements made in the River Bend FSAR. The entry was an internal GE procedure to assure consistency in its review and verification process.

Extent of Condition

At the time of the River Bend integrated design inspection (IDI) review, all project reports, engineering design reviews and verifications, and comparison with FSAR commitments had been completed. Removal of the procedural entry from the RR&IS was the only open and overdue item remaining.

Action to Correct Existing Condition

As noted, an engineering change notice (ECN) was issued to remove the entries from the River Bend RR&IS document.

Action to Prevent Recurrence

No further preventive action is required.

DEFICIENCY NO. D6.3-2

RESPONSE

Cause

This appears to be an inadvertent ommission.

Extent of Condition

As noted, the condition is limited and is not systematic.

Action to Correct Existing Condition

Engineering Change Notice (ECN) 55753 dated May 17, 1984, was issued to correct the existing condition.

Action to Prevent Recurrence

Because the deficiency is not systematic, no further action is necessary.

DEFICIENCY NO. D6.4-1

RESPONSE

As explained below, we do not concur that the cited condition constitutes a deficiency.

We concur that in order for the high-pressure core spray (HPCS) system to be operable, either the Division I or Division II standby service water (SSW) system supply and return to the HPCS diesel generator and HPCS pumproom unit cooler must also be available. However, as noted in Observation D6.4-1, "...the present River Bend design satisfies existing industry standards and NRC regulatory requirements with regard to the single failure criterion and a minimum redundancy of two independent core cooling systems."

Keeping in mind the current requirements for single failure, the River Bend Station design is considered more reliable overall in that there are now fewer total Division III (i.e., HPCS) components which can potentially fail and render the HPCS inoperable.

FSAR

The FSAR statement that "...the high pressure core spray diesel generator is operable as an isolated system independent of electrical connection to any other system" is correct. It simply means that Division III electrical power is not provided to any Division I or II loads, and conversely, no Division I or II electrical power is supplied to any Division III loads. Since the FSAR sections that define the mechanical portions of HPCS and SSW clearly identify the interface between these two systems, the FSAR is considered adequate as is.

MOVs

The MOVs associated with the SSW supply and return are intended to be left open at all times to ensure availability of cooling water from either SSW division in the event of an accident, while minimizing the number of devices which must change state in response to such an event. Use of the LOCA signal to automatically open these valves was not included in the design because:

1. The LOCA signal locks in, and depending upon actual plant conditions, considerable time may elapse before the control room operator can safely reset the LOCA signal.

2. During this period, if a pipe crack were to occur, the control room operator would be unable to close the MOVs to isolate the cracked pipe.

Therefore, not providing a LOCA-based automatic opening signal is in compliance with General Design Criterion 20. Since plant accessibility may be severely restricted following a LOCA due to radiation levels, racking

out of breakers and local locks at the MOVs was not employed, since overriding these devices in the event of pipe crack might not be reasonably achievable.

Inadvertent closure of one or all four MOVs would constitute a single failure induced by operator error; under such a condition, it is not required under single failure criteria that either the Division I or II electrical systems be postulated to fail concurrently.

Summary

Thus, while the River Bend Station design does not incorporate a dedicated Division III cooling water system, we believe that upon careful comparison with existing industry standards and NRC requirements, the River Bend Station design in this regard is equally, if not more, reliable. No additional action is planned at this time with respect to providing automatic realignment of the valves.

DEFICIENCY NO. D6.4-2

RESPONSE

Cause

An inadvertent oversight during preparation and review of Logic Diagram 9-10.3S (Revision 9) allowed the logic diagram to be issued with Division I and Division II reversed for the MOVs in question. Other associated drawings correctly show the power supply assignments for these valves.

Extent of Condition

A review of a sample of additional safety-related logic diagrams by the lead controls engineer has been completed. This review indicates that there is no systematic concern.

Action to Correct Existing Condition

E&DCR No. P-21,912 was issued on May 4, 1984, to correct the discrepancy on the logic diagram. No further action is required.

Action to Prevent Recurrence

Since the condition is not systematic, no preventive action is required.

DEFICIENCY NO. D6.5-1

RESPONSE

See response to Deficiency No. D5.8-2.

DEFICIENCY NO. D6.5-2

RESPONSE

Cause

No specific cause could be attributed. However, the following background is provided.

In the event of a loss of offsite power (LOOP) followed by a LOCA at time t = 0+ sec, the standby diesel generator would start upon the LOOP signal and not on the LOCA signal. The LOCA signal would be absent until the standby ac power source is reestablished from the diesel generator source.

Since standby ac power is essential for ESF system initiation, no credible sequence of events could be cited where the ESF systems could not start due to the absence of a LOCA signal. The power source to LOCA signal logic would reestablish immediately after the diesel generator breaker closed and restored power to the Class 1E electrical system. Other ESF system loads would be sequenced on time. We believe that the intent of 10CFR50, Appendix A; GDC 20 (Initiation of Systems/Components Important to Safety); and IEEE 279-1971 (Section 4.1 and 4.8) were met.

Extent of Condition

A detailed review of other ESF initiation signal logics and power supply sources was conducted in view of the subject code requirements. No similar conditions were found.

Action to Correct Existing Condition

All necessary engineering drawings were issued on May 3, 1984, to provide power to the LOCA auxiliary relays from a Class 1E uninterruptible power supply rather than a Class 1E ac source. This ensures that control power will be furnished to the relays under all conditions, including loss of offsite ac power.

Action to Prevent Recurrence

Since no similar conditions were observed in the review of extent, no specific preventive action is necessary.

DEFICIENCY NO. D6.6-1

RESPONSE

Inconsistencies noted in this finding do not constitute deficiencies in the design process. The policy implemented for the establishment of instrument setpoints is a controlled, technically acceptable process.

The policy for dissemination of safety-related instrument setpoints is clearly stated in SWEC Control Systems Division Memorandum CSDM 81/3-0, as follows:

> The issued setpoint calculation sheets will serve as the official source document for authorized instrument settings.

Similar rules for nonsafety-related setpoints are established by SWEC CSDM 82/11-0. In addition, this policy has been reinforced in other internal memoranda or Controls Group guidelines indicating that setpoints given on documents other than the setpoint calculation are for information only and are not to be considered official setpoint values. The actual calibration of instruments is based on the information contained in loop calibration reports issued to the testing organization and to the Client, and the only official source for preparation of these documents is the issued setpoint calculation.

Many of the related documents which include approximate setpoint information were prepared early in the life of the project, prior to the completion of formal setpoint calculations. In those cases, it was necessary to establish a target setpoint so that design and procurement could proceed. The actual setpoint could not be accurately calculated at that time, since the instrument had not been selected and the design process had not been completed. Generally, the desired process limit was developed by the responsible engineer and used as the interim setpoint.

Completion of formal setpoint calculations was scheduled to occur within 6 months of release of the equipment to the testing organization, followed by completion of loop calibration reports. This allowed the orderly scheduling of instrument procurement and the completion of the design process necessary to support completion of the calculations and resulted in minimal duplication of effort over the life of the project.

We do not believe that any problems exist in the above-described policy. This policy was deliberate and was implemented to ensure the issuance of technically correct documents. Affected project groups were notified and are aware of the policy. In addition, instrument calibrations are based only on loop calibration reports, which use issued setpoint calculations as the source.

DEFICIENCY NO. D6.6-2

RESPONSE

Cause

Setpoint Calculation No. 12210-IA-SWP*1 (Revision 1, dated September 27, 1983) did not contain a segregated list of assumptions under CALCULATION SUMMARY, as required by Control Systems Division Memorandum CSDM 81/3-0. Instead, the assumptions were stated throughout the calculation wherever appropriate. This represents a failure of the preparer to implement the format requirements of the CSDM, constituting an administrative problem only.

The deficiency also indicates that setpoint Calculation Nos. 12210-IA-SWP*1 (Revision 1, dated September 27, 1983) and 12210-IA-CCP*1 (Revision 0, dated August 2, 1983) did not use a new radiation basis (SWEC memorandum dated July 7, 1983, from T. P. Tonden to G. Bell, entitled 12210 Category I Setpoint Calculation Pressure Transmitter Accuracy in Radiation Fields). This basis, however, applies to intermediate radiation levels only and was not applicable to the radiation levels stated in either of the audited calculations. Calculation No. 12210-IA-SWP*1, Revision 1, dated September 27, 1983, used the radiation basis discussed on page 22 along with Reference 17; this radiation level (2 x 104 rads q, TID) was below the radiation level for which T. Tonden's interoffice memorandum (IOM) applied (i.e., TID > 7 x 104). However, in a subsequent revision of this calculation using updated location and environmental design criteria (EDC) information, T. Tonden's IOM became applicable and was used.

Calculation No. 12210-IA-CCP*1, Revision 0, dated August 2, 1983, referred to EDC radiation levels much higher than applicable to T. Tonden's IOM and used a higher documented radiation error based on Rosemount qualification test report, Reference 16.

In summary, T. Tonden's IOM on pressure transmitter accuracy was not applicable to either calculation revision level as audited; therefore we do not agree that this item constitutes a deficiency.

Extent of Condition

All presently issued calculations were reviewed to ascertain whether a list of stated assumptions is included and whether T. Tonden's IOM is applicable. It was found that all the calculations have the required list of assumptions, and all calculations presently refer to T. Tonden's IOM where applicable. The subject deficiency (list of assumptions) was limited to Calculation No. 12210-IA-SWP*1 only.

Action to Correct Existing Condition

Calculation No. 12210-IA-SWP*1, Revision 2, was issued on May 4, 1984, to correct the noted deficiencies. Calculation No. 12210-IA-CCP*1 does not require any correction. Since no deficiency exists, no further action is required.

Action to Prevent Recurrence

Since all subsequent calculations have been reviewed for the noted deficiencies and have been found not to have the subject deficiencies, no preventive action is necessary.

DEFICIENCY NO. D6.6-3

RESPONSE

We do not agree that this item constitutes a deficiency. Early in the life of the project, it was necessary to establish a target setpoint so that design and procurement could proceed. The actual setpoint could not be accurately calculated at that time, since the instrument had not been selected and the design process had not been completed. Generally, the desired process limit was developed by the responsible engineer and used as the interim setpoint. A more complete explanation of this procedure is given in the response to IDI Item D6.6-1.

Instruments were purchased to these preliminary setpoints, and the adequacy of these instruments is verified as a part of the formal setpoint calculation process. If the purchased instrument is inadequate, a new one is ordered to satisfy the calculated setpoint.

This requirement is clearly stated in SWEC Control Systems Division Memorandum CSDM 81/3-0 (Calculation of Setpoints for Nuclear Power Plant Category I Instruments) as follows: "Set point shall be prepared ... in conjunction with SWEC specification and vendor-supplied data, verify that the selected instrument meets functional requirements and is adjustable within the established tolerance and limits."

Therefore, there is no deficiency, since the policy takes this into account. In the case cited, the setpoint calculation was not yet issued.

However, it may be necessary to revise instrument ranges, etc, on technical data sheets, only if there is a chance that an incorrect future replacement could be ordered if the instrument technical data sheet is not changed.

In order to provide additional assurance that correct replacement instrumentation is procured, a Project Management memorandum will be issued to remind project personnel that instrumentation technical data sheets must be reviewed against issued setpoint calculations for any discrepancies which could affect procurement of replacement parts.

DEFICIENCY NO. D6.9-1

RESPONSE

This finding includes four basic concerns as follows:

1. FSAR Table 7.5-2 does not include battery current indication.

2. Normal service water system accident monitoring instrumentation for engineered safety features (ESF) cooling flow and temperature is implemented with QA Category II components.

3. The loop diagram indicated that the flow measurement is used for capacity checks, not for accident monitoring.

4. FSAR Table 7.5-2 has not been updated to include specific instrument identification numbers.

In addition, this finding also challenges the control of the design process.

With the exception of Item 1 above, we do not agree that deficiencies exist, or that there are systematic design control problems.

River Bend Station uses shared service water systems: the QA Category II normal service water system (NWS) and the QA Category I standby service water system (SWP). The quality of instrumentation for the NWS is commensurate with the quality of the NWS components to which the instruments are attached, that is, QA Category II. This exception to Regulatory Guide 1.97 is justified in FSAR Table 7.5-2, Note 17, and is therefore not a deficiency.

Loop diagrams indicate instrument identification numbers, function, and location. In the aforementioned Note 17, the system function is described. QA Category I instrumentation in the SWP initiates starting of the SWP and isolation from the NWS, should the NWS pressure decrease and render the NWS unavailable. This QA Category I instrumentation is consistent with the requirements of Regulatory Guide 1.97 for monitoring performance of cooling water flow and temperature to ESF system components and is therefore not considered a deficiency.

Whereas GSU suggested (IDI Reference 2) that SWEC include specific instrument identification numbers in FSAR Table 7.5-2, SWEC responded in SWEC Letter No. RBS-8188 dated December 20, 1982, that it would be inappropriate to do so, since inclusion of all the instrument identification numbers in Table 7.5-2 would make it unnecessarily unwieldy. FSAR Table 7.5-2 furnishes information consistent with the requirements of NUREG-0800, the standard review plan for Section 7.5, and is therefore not considered to be a deficiency. The NRC was subsequently provided with a list of instrument identification numbers, which included those used for Regulatory Guide 1.97 requirements, by means of GSU Letter No. RBG-17,668 dated April 24, 1984.

The information given above demonstrates that the RBS design is controlled and that no systematic design control deficiencies exist. To verify that the RBS design process has been adequately controlled, a review of all instruments required to meet Regulatory Guide 1.97 has been conducted with the results indicating that the Regulatory Guide 1.97 commitments have been satisfied.

With regard to Item 1 concerning battery current indication, the following applies:

Cause

The cause of the battery current being left off the list of Regulatory Guide 1.97 variables in FSAR Table 7.5-2 could not be determined.

Extent of Condition

This condition is confined to the specific device furnished to meet the requirements of Regulatory Guide 1.97 for measurement of dc battery current.

Action to Correct Existing Condition

FSAR Table 7.5-2 will be revised to include the dc ammeters for battery current.

Action to Prevent Recurrence

The results of the instrument review against Regulatory Guide 1.97 requirements show that no further action is required.

DEFICIENCY NO. D6.11-1

RESPONSE

Cause

Since equipment is typically located in various environmental zones, to ease the qualification program for the vendors, envelopes are generated for specifications consisting of worst case accidents as well as the worst case normal conditions for temperature, humidity, radiation, etc.

An error was noted in the data sheet i.e., worst temperature and humidity were not depicted in selecting the enveloping conditions.

It should be noted that the data sheet reviewed was a preliminary one.. This error would have been corrected during final review by issuance of an engineering and design coordination report (E&DCR) against Specification No. 247.481.

Further review has determined that there was no impact on the qualified life of the instruments.

Extent of Condition

A review of a sample of additional environmental data sheets was conducted. No similar conditions were observed.

Action to Correct Existing Condition

The parameters in question have been verified, and subsequently, E&DCR No. P-40,706 was issued on June 15, 1984, to correct the environmental requirements in the specification.

Action to Prevent Recurrence

No preventive action is considered necessary, since there is no apparent systematic concern.

DEFICIENCY NO. D6.13-1

RESPONSE

Cause

An oversight during preparation and review allowed SWEC Instrument Change Revision Notice 316-GE-C1 (dated February 16, 1984) to be issued with an incorrect reference, Calculation No. 12210-NP(S)-GE 1566 (Revision 1) instead of Calculation No. 12210-NP(S)-GE 1570 (Revision 1).

Extent of Condition

A review of a sample of additional SWEC instrument change revisions by a senior controls engineer has been completed. This review has confirmed that this condition is not a systematic concern.

Action to Correct Existing Condition

The subject instrument change revision notice was reissued on September 20, 1984, to correct the discrepancy. No hardware analysis impact resulted.

Action to Prevent Recurrence

Since there is no systematic concern, no preventive action is required.

DEFICIENCY NO. DA.1-1

RESPONSE

SWEC Engineering Assurance Procedure (EAP) 5.3 establishes the basic requirements that apply to all Engineering Department divisions for preparation of calculations. This procedure was developed to meet or exceed the requirements of 10CFR50, Appendix B, and ANSI N45.2.11, including those addressed in Deficiency No. DA.1-1.

Paragraph 4.1 of ANSI N45.2.11 states in part, "Design activities shall be prescribed and accomplished in accordance with procedures... which provides adequate control and permits reviewing, checking, or verifying the results of the activity by personnel who are experienced in the subject activity .... The design activities shall be documented in sufficient detail to permit verification and auditing as required by this standard" (emphasis added).

EAP 5.3 details requirements and methods to meet paragraph 4.2, Design Analysis, of the standard which directly addresses the requirements for calculations. This paragraph requires that calculations be identifiable by reviewer and that procedures controlling the preparation of calculations include requirements for calculation content, review, and approval. EAP 5.3, through detailed requirements for the preparation of calculations, also meets the basic requirements of paragraph 4.2 that analyses be prepared "...such that a person technically qualified in the subject can review and understand the analysis and verify the adequacy of the results without recourse to the originator." In meeting the requirements stated in paragraph 4.2, it is our view that the quoted requirement of paragraph 4.1 ("...to permit verification and auditing as required by this standard") is also satisfied by the requirements contained in EAP 5.3.

The only other requirement of ANSI N45.2.11 that could be viewed as related to the NRC concern is that contained in Section 6.0, Design Verification. Paragraph 6.1 requires that "Documentation of (design verification) results shall be auditable against the verification methods identified by the responsible design organization." To support this requirement, paragraph 6.3 requires that, "the responsible design organization shall identify and document the particular design verification methods to be used." The acceptable design verification methods listed and defined in paragraph 6.3 include "1. Design Reviews" and "2. Alternate Calculations." The primary verification methods identified in EAP 5.3 fall within the definition of "Design Reviews" as described in paragraph 6.3.1 of the standard; the only exception is the permitted use of "Alternate Calculations" as described in paragraph 6.3.2. EAP 5.3 provides for auditability of the verification method by requiring that calculations reviewed by use of an alternate calculation be identifiable by inclusion of the alternate calculation within the calculation reviewed.

Each SWEC engineering discipline is allowed, through the use of division procedures, to supplement the requirements contained in the EAP to meet

its specific needs. For example, since each building calculation contains numerous subcalculations for individual structural members, connections, and loading conditions, the Structural Division has found it desirable to document the preparer and the reviewer of each page of the calculation. Whereas the Engineering Mechanics Division, due to the specific nature of its calculations, has found that identifying the preparer(s)/reviewer(s) on the calculation title page, as required by EAP 5.3, is sufficient.

Based on the above, we cannot concur with Deficiency No. DA.1-1. We believe that EAP 5.3, by its detailed requirements for calculation content and review, meets and exceeds the requirements of ANSI N45.2.11 in relation to review requirements and providing an auditable record. We also strongly disagree with the conclusion, as stated in Attachment A-1, that EAP 5.3 is a root cause of any programmatic weakness in relation to review requirements. To the contrary, we believe that in view of the specific responsibilities and emphasis on review requirements in excess of regulatory requirements contained in EAP 5.3, it is a strength rather than a weakness in the SWEC design process.

GSU will readily impose and SWEC will adopt, regardless of any regulatory requirements to do so, any additional requirement to its quality assurance program that will enhance the quality of SWEC's work. We do not believe that adding requirements for identification of the review method, beyond those now in the EAP, would provide such enhancement.

DEFICIENCY NO. DA.1-2

RESPONSE

Cause

Given the quantity of mechanical calculations (three of four) found to contain arithmetic errors and the degree of error on Calculation No. PN-048, we concur that action is required to determine and correct the cause of such errors on mechanical calculations.

Page referencing mistakes are usually introduced after the calculation has been checked. If the original page numbering scheme is altered as a result of resolving items raised during the checking process, one of the last steps which must be performed is to read through the entire calculation to ensure that such references agree with the final page numbering sequence.

Extent of Condition

The extent to which arithmetic errors and page referencing errors exist is unknown (refer to Action to Correct Existing Condition, below).

Action to Correct Existing Condition

Calculation Nos. PN-048 and PN-268 will be revised as committed to in the responses to other deviations. Calculation Nos. PN-263 and PN-307 will be reviewed along with eighteen other calculations selected by the lead power engineer to represent calculations done in different time frames and for diverse objectives. These 20 calculations will be reviewed for arithmetic and page referencing accuracy. If no significant problems are discovered, then action will be complete at that point. If other problems are discovered, additional action will be taken upon completion of this review. A supplemental response will be submitted on completion of this review.

Action to Prevent Recurrence (Short term)

The lead power engineer will issue a memorandum to all River Bend Project power engineers requiring that:

1. Careful attention be paid to arithmetic computations.

2. Page referencing checks be made prior to issuance of any calculation whose initial page numbering scheme is altered as a result of the checking process.

The need for long range preventive actior will be determined based on the review described under Action to Correct Existing Condition.

UNRESOLVED ITEM NO. U3.4-1

RESPONSE

No action is required. The effects of the inclusion of the trapeze hanger weight would be negligible for the following reasons:

1. Less than 1/3 of the weight (300 lb) of the trapeze hanger will move together with the piping during a seismic event.

   Most of the trapeze hanger assembly is decoupled from the piping due to the low lateral stiffness of the hanger rods.

2. The addition of the 300-lb weight would be equivalent to increasing the length of the pipe by 1 ft, since the pipe plus insulation weighs 316 lb/ft. The snubber closest to the trapeze hanger supports a portion of the main steam piping which weighs approximately 14,000 lb. Therefore, if the 300-lb support mass were included in the seismic analysis, the increase in piping and support loads would be negligible.

UNRESOLVED ITEM NO. U4.16-1

RESPONSE

The NRC provides guidance in Standard Review Plan (SRP) Section 3.7.2 for analyzing piping and support systems. River Bend FSAR Section 3.7.2.1.1.2A provides criteria acceptable to the NRC for decoupling the mass of pipes from their associated supports. Although Reactor Controls, Inc., did not explicitly comply with the criteria, the intent was met. However, insufficient justification for the analytical methodology was provided.

In order to demonstrate that the methodology used was adequate and in conformance with licensing requirements, the following evaluation was performed:

Background

The River Bend CRDHS insert/withdraw piping configuration consists of bundles of 1.0- and 1 1/4-in. NPS piping supported by large rigid frame structures. A single support in this configuration will support approximately 74 individual pipes. The piping configuration, although similar, is unique enough that at various support locations, the individual response from pipe to pipe will vary significantly.

Purpose

The purpose of this evaluation is to demonstrate that:

1. The effects of pipe mass are adequately accounted for in the support structure analysis.

2. The frequency response for the three supports analyzed dynamically would not be significantly affected by the addition of pipe mass.

3. The conservatism built into the current analysis methods is more than adequate to qualify the supports for their intended function.

4. SRP 3.7.2 and FSAR Section 3.7.2.1.1.2A are satisfied.

Method

Piping dynamic response loads are applied statically to the supports by absolute sum method, assuming the peak response from all individual piping occurs in-phase. This is very conservative, because in actuality the piping frequency response will vary, causing cancellation of reactions within the pipe bundle.

Additionally, a study to evaluate the effect of pipe mass was conducted using a worst case example (i.e., highest pipe mass to support mass ratio). The results of the run with pipe mass when compared to that without pipe mass confirmed that the shifts in frequency response of the support had minor effects on the member stresses. The effects were both increased and decreased response.

This shift in frequency is well within the added conservatism of the input response spectra due to peak broadening and enveloping. Therefore SRP 3.7.2 is met.

Conclusion

The method being used is adequate for predicting the dynamic response and stresses developed due to combined piping and support interaction.

Including the mass of the piping in the frequency analysis of the support only adds unnecessary conservatism to the analysis, which already includes the piping response applied in a conservative manner.

UNRESOLVED ITEM NO. U5.5-1

RESPONSE

The decision to develop diagrammatic conduit drawings was based on providing greater flexibility to Construction to enable them to resolve unforeseen installation anomalies, while still maintaining proper control of the design and installation configuration. Engineering furnishes to Construction a sufficient variety of seismically designed conduit support details to allow them to properly attach conduits in seismic Category I structures.

Conduit raceway drawings illustrate the raceway tie point (i.e., their termination points at other raceways or at devices) for each end of the conduit and show the fire area in the plant through which the conduit must be routed. Whereas Construction may reroute the conduit to facilitate their installation efforts and suit field conditions, control is maintained over their rerouting by specific directions included on the QA Category I raceway drawings. E&DCR No. P-21,041 directs Construction to install Field-run divisional conduit within the same fire area locations shown on the raceway drawings. Electrical Engineering is thus assured of knowing that conduit will be installed in the same fire area, therefore maintaining the engineering evaluation performed for the RBS fire hazard analysis. E&DCR No. P-22,007 permits Construction to deviate from the raceway tie points shown on a particular drawing by maintaining the revised information in the electrical cable schedule information system (ECSIS) data base by means of a handwritten raceway ticket.

Any deviation from the above direction requires either an E&DCR to request a drawing change or an N&D to depict the actual installed configuration. Approval of these deviations from intended design by SWEC's Electrical Engineering Group effectively communicates such changes to ensure proper evaluation.

ECSIS is a controlled program and is the source of information and direction used by Construction for raceway and cable installation. Design information shown on the electrical drawings is entered into ECSIS by the Electrical Engineering and Design Group. Information provided by ECSIS includes raceway tickets and cable pull tickets. Raceway tickets are furnished to Construction to identify raceway material, pertinent raceway drawing numbers, and raceway ties. Upon acceptable completion of raceway installation, the raceway tickets (for Category I installations) are verified and signed by FQC. Since work deviating from the tickets will not be accepted by FQC, a procedure is enforced whereby handwritten revisions can be made to issued tickets by Construction. These changes, however, must be approved by the engineers and signed by the lead electrical engineer or senior electrical engineers or their designees in accordance with procedure prior to use by Construction. Copies of these changes are required to be sent to the lead electrical engineer for incorporation into the ECSIS data base. Generation of the revised computer-printed raceway ticket will result in a copy being sent to Construction, at which time it and the handwritten (revised) ticket will be verified and signed by FQC. Control by SWEC's

Electrical Engineering Group of the input to ECSIS and of Site-generated changes is exercised to provide assurance that the RBS installation configuration is technically correct and compatible with regulatory commitments.

Electrical installation Specification No. 248.000 includes a requirement for ensuring that the River Bend Station installation complies with Regulatory Guide 1.75 requirements. The specification and drawings referenced, 12210-EE-34ZE, ZF, ZG, ZH, and ZJ, provide detailed and complete direction to Construction for implementation and to FQC for verification.

PMM-152 for high-energy line break analysis, PMM-160 for electrical separation to Regulatory Guide 1.75, and PMM-163 for medium energy line crack analysis all require participation of site personnel to assist in the successful completion of analyses. Field walkdowns of conduit installations provide greater assurance of identifying potential targets of line breaks, sprays, or separation infractions than by evaluating drawings alone. By using both equipment location drawings, raceway drawings, and field walkdowns, these and similar studies can be reasonably assured to be complete and accurate.

We believe that the existing program is adequate to maintain control over the design and installation of electrical raceway.

UNRESOLVED ITEM NO. U5.12-1

RESPONSE

We believe that this item should be considered as resolved and that no additional action is necessary.

The IDI team considerd this issue unresolved because they believed that the lube oil (keep warm) system for the Transamerica DeLaval, Inc. (TDI), diesel generators should be powered by a Class 1E power source, similar to that furnished by GE for the HPCS diesel generator. This opinion was based, in part, on the apparent inconsistency of having an unqualified non-Class 1E motor driving a seismic Category I, ASME III pump.

SWEC's Electrical Engineering Group reviewed TDI assignments of ASME, non-ASME, and DEMA components of the standby diesel generators in early 1981. At that time SWEC questioned motor qualification of the jacket water and lube oil keep warm systems (IDI Reference 5). At a meeting held at TDI's Oakland, California, facility on May 10, 1983, SWEC again questioned motor qualification for lube oil and jacket water keep warm systems.

TDI responded (IDI Reference 4) by stating that these pumps are designed to enhance starting capability and to flatten out the thermal gradient of the diesel generator upon starting, at which time the engine-driven pumps would take over.

One reason for having ASME III pumps and piping is to maintain pressure boundaries for fuel, lube oil, and water regardless of the qualification of the motor drivers.

The response was accepted for two reasons. While SWEC is responsible for establishing the performance requirements, TDI is obligated to furnish equipment capable of meeting performance requirements as incorporated into the Category I purchase specification, which include the requirement for starting and accepting load in 10 seconds. Secondly, TDI is responsible for establishing the design basis for their diesel generator to meet SWEC's performance criteria.

The IDI report refers to NUREG-CR0660 in terms of its recommendations for starting the prelube pump with the same signal that starts the diesel generator. TDI's design includes a continuous prelube system which, rather than starting with the diesel generator start signal, operates continuously during the standby mode to provide greater assurance that the diesel generator is properly lubricated for easier starting when required.

Also referenced in the IDI report is NUREG-0800, the standard review plan, which is the guidance provided to the NRR reviewers recommending that the lube oil temperature be properly maintained to improve first start capability. TDI's design also includes a non-Class 1E lube oil heater to accomplish this. Alarms in the main control room indicate the proper operation of the prelube keep warm system (by monitoring the

header inlet and outlet temperature and alarming low temperature), providing further assurance of the diesel generator's ability to start when required.

In the response to these concerns, TDI defended the non-Class 1E classification of the prelube motor by stating that it does not perform a Category I function. TDI stated that it enhances the diesel generator's ability to perform its Category I function. The prelube keep warm system is intended to provide greater assurance that the diesel generator will start on command and to improve the longevity of engine parts, thus reducing downtime and related expenses.

UNRESOLVED ITEM NO. U6.7-1

RESPONSE

Due to the complexity of the standby service water (SSW) system and its interfaces with several other systems, it was decided not to attempt to describe in the FSAR the specific degree to which online testing of the SSW system can be conducted. Rather, the FSAR reflects the basic commitments relative to Safety Guide 22 with the intent that specific details would be included in appropriate operating and testing procedures.

Since Table 1.8 of the FSAR reflects commitment to Safety Guide 22, only possible exceptions taken to Safety Guide 22 need to be addressed in the FSAR. Detailed descriptions of the methods for implementing this commitment will be included in other appropriate documents (e.g., operating and testing procedures).

SWEC will rereview the SSW system and its interfaces with other systems to verify compliance with Safety Guide 22. If any exceptions are noted, the FSAR will be modified accordingly.

ENCLOSURE B

Initial Issue
October 24, 1984

EVALUATION PLAN
RIVER BEND PROJECT
TECHNICAL EVALUATION (OCT. - DEC. 1984)

1.0 PURPOSE

To determine if deficiencies, similar to the deficiencies identified in the River Bend IDI Report, exist in other aspects of the River Bend design and if similar deficiencies do exist to determine the impact of the deficiencies on the adequacy of the River Bend design.

2.0 GENERAL APPROACH

A team, under the direction of the Stone & Webster Engineering Corporation (SWEC) Engineering Assurance Division (Boston), will be established to conduct the evaluation. The team will identify deficiencies similar to those identified in the IDI report and review a sample of other systems for the existence of such deficiencies. If deficiencies are found in other aspects of the River Bend design, the evaluation team will determine the impact of the deficiencies on the adequacy of the design. A report will be issued describing the scope and approach to the evaluation, the results, and recommendations, if any, for further action.

3.0 EVALUATION TEAM

The team will function under the direction of DLMalone, Supervisor Internal Auditing, SWEC Engineering Assurance Division (EA) Boston. The team will consist of SWEC and Gulf States Utilities (GSU) personnel. The SWEC team members will be off-project experienced technical personnel. At this time it appears that the following disciplines will be represented on the team: Power, Controls, Structural, Engineering Mechanics, and Electrical. Final team selection has not been completed. At this time, personnel listed below have been assigned to the evaluation team.

Name	Discipline	Title
FFChin	Structural	Senior Structural Engineer (SWEC)
RFortier	Power	Supervisor, Systems Engineering Group (SWEC)
JHarkins	Controls	Senior Controls Engineer (SWEC)
HWMooncai	Electrical	Electrical Engineer (SWEC)
SPurohit	Eng'g. Mechanics	Supervisor, Engineering Mechanics Division (SWEC)
GEnglert	Nuclear Plant Engineering	Senior Mechanical Engineer (GSU)
CLambert	Project Engineering	Supervisor-CHOC Engineering (GSU)

4.0 DETAILED APPROACH

4.1 Preparation

- The Evaluation team will review the IDI Report and the Project responses to gain a clear understanding of the reported deficiencies.

- Related deficiencies to be pursued in the evaluation will be grouped into appropriate categories (e.g., inconsistencies between engineering documents and the FSAR). The approach will be to select specific deficiencies which if they exist have more than a remote possibility for impacting design adequacy. The basis for categorization will be documented.

- From an initial review of the IDI identified deficiencies and draft responses to the deficiencies, the following are examples of the categories or general attributes that will be evaluated:

  o Consistency between design and FSAR.

  o Compliance with NSSS criteria/requirements.

  o Adequacy of calculations supporting the design.

  Other attributes may be added after a detail review, by the evaluation team, of the IDI report and final responses to the report. The Evaluation Plan will be updated to include the results of this review.

- The evaluation team will identify any IDI report deficiencies which will not be pursued in the evaluation (items that have no or only a remote potential for impacting design adequacy). The basis for the decision will be documented.

- The evaluation will focus on design areas under SWEC's scope of responsibility but will include work that interfaces with the Nuclear Steam System Supplier (NSSS).

- The Reactor Core Isolation Cooling (RCIC) and Fuel Building Ventilation (HVF) Systems will form the basis of the evaluation. Portions of other systems and structures will be reviewed as deemed appropriate to meet the purpose of the evaluation.

- Review Plans (checklists) will be prepared, based on the general attributes, to identify the detail attributes that will be pursued and the systems, structures, or components which have been selected for evaluation.

4.2 Performance

The evaluation team will be temporarily located at CHOC to perform the evaluation. The team will use the review plans as the basis to perform the detailed review of the design documents and to discuss the design with Project personnel. If deemed necessary, a visit to the construction site will be included in the evaluation.

The evaluation team will be required to annotate the review plans to specifically identify the design documents reviewed (including issue/revision identification) and to document the results of the review for each attribute.

During the performance of the evaluation, the Project will be informed of potential concerns or requested to provide needed information using an "ACTION ITEM" form. The Project engineering staff will be expected to promptly respond to each Action Item providing the information requested or a response to the potential concern. A status log will be maintained to track and account for all Action Items.

Each potential concern will be investigated to the extent necessary to determine the validity of the concern, the effect on the design as released for construction, the effect on the adequacy of the design, and the need for further review to determine the extent of the condition.

Each potential concern judged to be valid by the evaluation team will be further reviewed by the Chief Engineer or an Assistant Chief Engineer from the Engineering Assurance Division and by the Chief Engineer or an Assistant Chief Engineer from the appropriate technical discipline.

Periodic status meetings will be held by the Evaluation Team Leader and the SWEC Project Engineer. The purpose of these meetings will be to discuss the progress of the evaluation and the status of any open Action Items.

At the conclusion of the evaluation and prior to issuance of the Evaluation Report a meeting will be held by the Evaluation Team Leader with the SWEC Project Engineer and appropriate SWEC and GSU management personnel to discuss the results of the evaluation and the recommendations of the evaluation team.

4.3 Preparation of the Evaluation Report

An evaluation report will be prepared by the evaluation team and approved by the Chief Engineer, Engineering Assurance Division. The report will include the following:

- o Description of the scope and approach to the evaluation.
- o Categorization of all Action Items similar to the following:
  - Number of Information Requests.
  - Number of non valid potential concerns.
  - Number of deficiencies which resulted in no changes to design released to construction.
  - Number of deficiencies which resulted in changes to design released for construction.

- o For deficiencies which result in changes to design released for construction, an assessment of the significance of the deficiency on the adequacy of the design had the change not been made.

- o Recommendations, if any, for further evaluation of deficient conditions or for further review of additional aspects of the River Bend design.

5.0 TENTATIVE SCHEDULE

October 17-23	Preliminary selection of team members.
October 15-25	Perform detail review of IDI identified deficiencies. Establish categories to be pursued in evaluation. Document basis for categorization and basis for excluding any deficiencies from evaluation. Establish systems/structures/components that will be reviewed. Revise evaluation plan to document decision made, scope, and provide details. Also include any input from meetings with NRC and GSU.
October 26 - November 2	Develop detail Review Plans to implement Evaluation Plan.
November 5-16	Evaluation at CHOC (and site if necessary).
November 19-23 Thanksgiving week	Bring paperwork up-to-date. Discuss progress. Review potential concerns with Division Chief Engineers.
November 26 - December 7	Evaluation at CHOC.
December 10-14	Prepare draft report.
December 20	Post evaluation conference.
January 3	Issue report.

D.L. Malone, Evaluation Team Leader — Date: 10/24/84

W.M. Eifert, Chief Engineer, Engineering Assurance — Date: 10/24/84

TECHNICAL EVALUATION
RIVER BEND PROJECT

ACTION ITEM

ACTION ITEM NO._____ REV._____

TITLE:_____ DISCIPLINE:_____

DATE:_____

TEAM MEMBER:_____

POTENTIAL CONCERN/QUESTION

ACTION ITEM NO._____ REV._____

PROJECT RESPONSE

(Response should be provided within 24 hours if possible. Project should discuss the validity and accuracy of the concern, the significance, probable cause, and probable extent. The Project should provide any specific information that is requested or any other information the Project may have that could alleviate the concern).

PROJECT:_____ DATE:_____

EVALUATION OF RESPONSE

ACTION ITEM NO. _____

DATE: _____

REV: _____

_____ _____ _____ _____

TEAM MEMBER DATE TEAM LEADER DATE

ADDITIONAL REVIEWS AND COMMENTS

Reviews of valid concerns, background information, resolution of concerns, are to be documented below.