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WILLIAM T. COBLE  
Vice President  
Nuclear Operations

July 27, 1989

U.S. Nuclear Regulatory Commission  
Mail Station Pl-137  
Washington, D.C. 20555

Attention: Document Control Desk

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
Report No. 50-416/89-16-03  
dated 07/27/89 (MAEC-89/0210)  
AECM-89/0149

System Energy Resources, Inc. hereby submits response to violation  
50-416/89-16-03.

Yours truly,

WTC:mtc  
Attachment

cc: Mr. D. C. Hintz (w/a)  
Mr. T. W. Cloninger (w/a)  
Mr. J. G. Cesare (w/o)  
Mr. R. B. McGehee (w/a)  
Mr. N. S. Reynolds (w/a)  
Mr. H. L. Thomas (w/o)  
Mr. H. O. Christensen (w/a)

Mr. Stewart D. Ebnetter (w/a)  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region II  
101 Marietta St., N.W., Suite 2900  
Atlanta, Georgia 30323

Mr. L. L. Kintner, Project Manager (w/a)  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Mail Stop 14B20  
Washington, D.C. 20555

PCOM AECM-89/0149 - 1

P O BOX 156 | GRAND GULF NUCLEAR STATION  
PORT GIBSON, MISSISSIPPI 39150 | 601 437-6809  
A Middle South Utilities Company

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PDR ADDCK 05000416  
Q PNU

## Notice of Violation 89-16-03

10CFR50, Appendix B, Criteria III, Design Control, requires that measures shall be provided for verifying or checking the adequacy of design, such as by the performance of design reviews, or by the performance of a suitable testing program. Design changes including field changes shall be subject to design control measures commensurate with those applied to the original design.

Technical Specification 6.8.3.c states, a post-accident sampling program shall be established, implemented and maintained which will ensure the capability to obtain and analyze reactor coolant, radioactive iodines and particulates in plant gaseous effluents, and containment atmosphere samples under accident conditions. The program shall include training of personnel, procedures for sampling and analysis, and provisions for maintenance of sampling and analysis equipment.

Contrary to the above, the licensee failed to adequately review, implement and test Design Change Package 87-4018, Post Accident Sample System (PASS) atmospheric and liquid panel modification. This resulted in the PASS System being incapable of being used to take a liquid radionuclide accident sample from April 27 to June 7, 1989. Additionally, the system drawing was revised and did not reflect as-built conditions. The system operators and engineer were inadequately trained in the proper operation of the system in that they believed the system could only operate under full reactor system pressure. The sampling program was inadequate in that required semiannual samples for RHR and suppression pool were not taken from January 1986 to June 1989 and RHR B and drywell sample paths were never demonstrated.

I. Admission or Denial of the Alleged Violation

System Energy Resources, Inc. (SERI) admits to the alleged violation. This violation had no effect on the health and safety of the public.

II. The Reason for the Violation, if Admitted

A. Background

Design Change Package (DCP)-87/4018, Post Accident Sampling System (PASS) atmospheric and liquid panel modifications, was issued to enhance the system's overall ability to function in accordance with NUREG-0737. This enhancement reduced the overcrowded conditions which existed in the system, in addition to addressing ALARA design concerns.

This design change modification relocated the atmospheric sampling subsystem (in a separate panel) dedicated to atmospheric sampling.

B. Inadequate Review, Implementation and Testing of DCP-87/4018

1. Inadequate Review

This Post Accident Sampling System design change was very complex, involving a major redesign of the entire system to encompass relocating the atmospheric sampling subsystem adjacent to the existing PASS panel (1P33-P001).

DCP-87/4018, Revision 1 was issued to the Plant Modification and Construction (PM&C) Department for implementation. The responsible Field Engineer reviewed the design change package and developed step-by-step work instructions to facilitate implementation of required activities. An in-depth review of each section of DCP-87/4018 and associated drawings was required to ensure all aspects of the modification to the PASS were addressed in the work instructions. However, the work instructions did not address physical removal of valves P33 F719 and P33 F720, which were being deleted because they were no longer required for their designed function, i.e., flushing lineups.

Contributing Factors

The inadequate review of DCP-87/4018 resulted in Valves P33 F719 and P33 F720 being left installed and isolated, which prevented PASS operators from taking required post-accident liquid radionuclide samples.

Contributing factors which led to this incident are as follows:

- a. Field Sketches (FSKs) were provided for tubing modifications to panel 1P33-P001 as well as other panels to reflect removal of field installed tubing. However, they are not typically provided for internal vendor panel tubing configurations.

Responsible field engineers have relied on FSKs in the past to emphasize valve deletions to vendor supplied equipment. In this case, an FSK was not provided to show deletion of tubing for valves F719 and F720, thereby contributing to the engineer's omission of a step in the work instructions to delete these valves.

- b. "Clouding" of design drawings to define the change envelope is a practice that typically is a significant aid to the Field Engineer in understanding the scope and individual elements of a design change. Because of the large magnitude of this design change, the "clouding" did not draw attention to the deletion of valves F719 and F720. A more detailed review of the P&ID was required to understand the full DCP scope.

## 2. Inadequate Implementation

Upon completion of modifications to the PASS, the responsible Field Engineer and the System Engineer for PASS were required by procedure to perform a post modification walkdown of the system to ensure modifications were performed in accordance with DCP-87/4018, Revision 1. The deficiencies were not deleted.

During post-modification testing the inability to adequately perform sampling requirements was discovered and a more detailed walkdown was completed. Plant personnel then discovered that air to the solenoids for valves F719 and F720 had been disconnected but the valves were left installed contrary to the design intent. Personnel also observed that other valves and piping were not per the as-built drawings.

### Contributing Factors

Inadequate implementation of DCP-87/4018 resulted in valves F719 and F720 left installed in the closed position. This blocked the PASS reactor coolant undiluted pressurized grab sample connections, preventing the capability to take liquid radionuclide samples.

Contributing factors which led to this incident are as follows:

The original System Engineer resigned just prior to Refueling Outage No. 3 (RF03). The new System Engineer had only a short time to become familiar with the system and the modifications. For this reason, in addition to the heavy outage work load, the detailed post modification walkdown of the system was not adequate.

## 3. Inadequate Post Modification Testing

Retest Instruction 1P33-89-001-O-N was written by System Engineering to perform post modification testing of the PASS. However, it did not ensure timely restoration of the system following completion of DCP-87/4018.

### Contributing Factor

An operational review was performed for DCP-87/4018 on April 27, 1989. This review failed to adequately identify PASS testing requirements for startup conditions.

Additionally, the resignation of the original PASS System Engineer prior to the Outage and the new System Engineer's unfamiliarity with the system and previous modifications contributed significantly to this incident.

4. Identification Numbers: Inspection Report 50-416/89-16 stated "The package contained vendor equipment numbers which were not converted to SERI system numbers..."

A Review of Section 8.0 of DCP-87/4018 indicated a typographical error was made in the SERI identification numbers for the deleted valves. A change notice was dispositioned to reflect the correct identification numbers. It is SERI's position that this was not a contributing factor or a cause of the inadequate DCP implementation.

C. Inadequate Sampling Program

1. Safety Evaluation Report, Supplement #4 (SSER) Compliance

SSER #4, Section 22.2, II.B.3, requires that a post-accident sampling program be performed on a semiannual basis and consists of obtaining and analyzing reactor coolant, suppression pool and Residual Heat Removal (RHR) samples chemically and radiochemically by persons responsible for post-accident procedures.

SERI failed to implement this requirement as described.

Contributing Factors

Contributing factors which led to this incident are as follows:

- a. SERI implemented the post-accident sampling program as committed to in the Updated Final Safety Analysis Report (UFSAR), Section 7.7.1.11.4.3, which requires PASS to be used to perform at least monthly reactor coolant sample analyses.

SERI considered the UFSAR to be a viable approach to meet the requirements of NUREG-0737; however, this program did not reflect the requirements of SSER #4, i.e., samples taken from the suppression pool and RHR on a semiannual basis.

- b. The Licensing Commitment Tracking System (LCTS) did not identify SSER #4, Section II.B.3.1(c) as a plant commitment. The SSER # 4, Section II.B.3.1 remarks indicated it contained both NRC comments and requirements. The LCTS reviewers considered Subsection C of this section to be a comment not a commitment.

2. Semiannual Samples

The post-accident sampling program was developed and implemented using the frequencies described in the UFSAR, i.e., reactor coolant samples were taken and analyzed at least monthly from either the jet pump diffuser instrument line or Recirculating Loop "A" sample line.

Suppression pool and RHR "A" and "B" samples were not obtained and analyzed on a semiannual basis.

Contributing Factor

SERI failed to recognize and incorporate the requirements of SSER #4 into the post-accident sampling program relative to sampling the suppression pool and RHR.

3. Demonstrated Sample Paths

SERI's sampling program encompasses monthly reactor coolant samples, semiannual sampling of diluted reactor coolant and containment atmosphere sampling. Although RHR B and Drywell sample paths have been demonstrated, no documentation could be found to substantiate this testing.

4. Inadequate System (PASS) Training

The PASS operators (Chemists) failed to display proficiency in the operation of the PASS after startup from RF03. Inadequate implementation of the DCP resulted in uncertainties regarding sampling capabilities.

Contributing Factor

Training for plant chemists was deficient because no definitive instructions or guidelines had been established to identify PASS operational capabilities in all modes of plant operation.

III. The Corrective Steps which have been taken and the Results AchievedA. Immediate Actions

SERI personnel performed a comprehensive investigation into the root causes of the deficiencies described in Section II above. Actions included:

- Initiation of Corrective Action Report #2263 to document PASS programmatic deficiencies
- Initiation of a Modification Work Permit (MWP) to facilitate removal of valves F719 and F720 from the system
- Formation of a PASS Task Force chartered to investigate and document DCP-87/4018 deficiencies
- A walkdown of the Post-Accident Sampling System tubing to identify as-built discrepancies
- A review of the Design Change Package to determine if all design requirements were met
- Restoration of the PASS to operable status after completion of required post-accident sampling modifications and analyses

Specific Actions

B. The following actions have been or will be taken as a result of the inadequate review, implementation and testing of DCP-87/4018.

1. Inadequate Review

- a. A Quality Deficiency Report (#198-89) was initiated to document this event. Material Nonconformance Report No. 233-89 was initiated to track material nonconformances identified with PASS.

A change notice was also initiated and implemented via a Modification Work Permit (MWP) to provide specific instructions for removal of valves F719 and F720.

- b. Although a field sketch would have aided the engineer in identifying the valves to be removed, sufficient detail was contained in the DCP to allow correct DCP implementation.

Responsible Field Engineers will be directed, via a memorandum, to perform an in-depth review of future DCPs, especially large scale changes of drawings, prior to developing work instructions. Emphasis will be placed on ensuring a detailed comparison of DCP drawings versus current issued drawings are performed independent of the general instructions provided by NPE.

Should the review indicate that an FSK is required for modification activities, NPE will be contacted. Responsible engineers will be trained by August 31, 1989.

- c. NPE engineers responsible for developing DCPs will be instructed via a Quality Engineering Training Bulletin to limit "clouding" on design change documents to encompass only the scope of the change when possible. This bulletin will be issued as required reading to appropriate personnel. Training will be completed by August 31, 1989.

2. Inadequate Implementation

- a. The responsible System Engineer (and alternates) will attend a training course on the Post-Accident Sampling System. This course is designed to identify operational capabilities in all modes of plant operation. It also includes modifications made to the system during RF03. Training will be completed by September 13, 1989.

- b. A Material Nonconformance Report (MNCR #235-89) was initiated to address the as-built drawing discrepancies discovered during walkdown of the PASS. Each discrepancy has been dispositioned by NPE. Actions required as a result of this disposition will be completed by the end of Refueling Outage Number 4 (RFO4). The outstanding items do not affect PASS operability.

3. Inadequate Post Modification Testing

- a. Lesson Plan EP-EP07-LP-002-00 has been developed to identify PASS operational capabilities in all modes of plant operation. This course will also identify modifications made to the system during RFO3. Responsible PASS System Engineers and alternates will attend this class. Training will be completed by September 13, 1989.
- b. Quality Deficiency Report (QDR#203-89) was written to document inadequate post modification testing of the PASS. Corrective actions associated with the QDR will be completed by October 10, 1989.
- c. Administrative Procedure 01-S-16-1, Plant Design Change Implementation will be changed to provide an additional review during DCP closeouts and operability reviews by the System Engineering Superintendent to determine if additional expertise is required for specialized systems requiring dual interface, i.e., plant specialist and system engineer. This change will be implemented by August 31, 1989.

C. The following actions have been or will be taken as a result of maintaining an inadequate sampling program.

1. Safety Evaluation Report, Supplement #4 (SSER) Compliance

- a. As previously committed (Reference AECM-89/0137 dated July 27, 1989), the PASS Chemistry Program will be revised to require semiannual sampling and analysis of a depressurized sample from the suppression pool, RHR A or RHR B sample paths. SERI will sample each point separately in consecutive 6-month intervals, rotating sampling personnel for training purposes. This approach will sample all three points on an 18-month interval.

Should the PASS or a specific PASS sample path be found to be inoperable, SERI will restore it to operability within 24 hours or SERI will make a telephone notification to NRC Region II describing the event and an assessment of the actions planned to restore operability. This revised program has been implemented and the associated administrative procedure will be issued by August 7, 1989. This description of the revised program will be included in the 1990 update of the UFSAR.



A Quality Deficiency Report (QDR # 207-89) was also written to document inadequate PASS sampling frequencies and training. Corrective actions associated with this QDR will be completed by October 14, 1989.

- b. A Quality Deficiency Report (QDR #228-89) was initiated to document the failure to identify SSER #4, Section 22.2, II.B.3 in the Licensing Commitment Tracking System (LCTS) as a plant commitment. Corrective actions associated with this QDR will be completed by November 6, 1989.

As a result of this QDR, SSER # 4 was reviewed for similar discrepancies. This review indicated that no other SSER #4 discrepancies existed in the LCTS.

2. Semiannual Samples

The actions described in Section C.1(a) above will be taken to address this item.

3. Demonstrated Sample Paths

The actions described in Section C.1(a) above will be taken to address this item.

4. Inadequate System (PASS) Training

- a. Chemistry Lesson Plan Number EP-EP07-LP-002-00 has been developed to identify PASS operational capabilities in all modes of operation. Chemist personnel will attend this class. This course will also identify the changes made during RFO3 to the system.

Training implementation will be completed by September 13, 1989.

IV. Corrective Steps Which Will be Taken to Preclude Further Violations

The actions described above are intended to preclude further violations. Additionally, a second Task Force consisting of representatives from NPE, Plant Chemistry, Quality Programs, Performance and System Engineering and Nuclear Licensing has been formed to review other operating license required systems and programs. This Task Force will recommend enhancements to these programs as required.

V. Date When Full Compliance Will be Achieved

Any corrective actions or enhancements identified as a result of the reviews described in Section IV will be evaluated for implementation by March 15, 1990. Implementation required as a result of these evaluations will be completed by the end of RFO4.