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 MARTIN,J.B. Region 5, Ofc of the Director
 RECIP.NAME RECIPIENT AFFILIATION
 VAN BRUNT,E.E. Arizona Nuclear Power Project (formerly Arizona Public Serv

SUBJECT: Forwards Special Team Insp rept 50-528/88-01 on 880104-0212
 & notice of violation.

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Docket No. 50-528

Arizona Nuclear Power Project
P. O. Box 52034
Phoenix, Arizona 85702-2034

Attention: Mr. E. E. Van Brunt, Jr.
Executive Vice President

SUBJECT: NRC INSPECTION OF PALO VERDE NUCLEAR GENERATING STATION
UNIT NO. 1

Gentlemen:

This refers to the special team inspection of January 4 through February 12, 1988, conducted by Mr. M. M. Mendonca and other members of our staff, of activities authorized by NRC License No. NPF-41 and to the discussion of our findings held with you on February 12, 1988, and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the team.

Inspection Overview

The inspection conducted by the team was a safety system functional inspection (SSFI). The objective of an SSFI is to assess the operational readiness of selected safety systems to function under all operational and analyzed accident conditions. The first step involves the selection of a small number of plant systems that have significant impact on plant safety and which involve a broad cross section of site activities. For this inspection, the Essential Chilled Water System (EC), Essential Cooling Water System (EW), and Essential Spray Pond System (SP) were selected for review with additional attention to interfaces with supporting and serviced systems. These systems were selected because it is considered essential that they function correctly following an event such as a loss of offsite power or a major plant transient. Additionally, probabilistic risk assessment studies of pressurized water reactors have indicated that the failure of the selected systems, following a loss of offsite power or a major plant transient, generally contributes highly to the probability of occurrence of a core melt event or an event with significant offsite consequences.

In assessing these systems, the team focused primarily on the capability of your engineering organization to establish and access the design basis of the systems; and their capability to maintain the design basis when modifying the systems and during system operation. Additionally, the

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team considered the actual implementation of the design basis through maintenance, surveillance, testing, and plant operational aspects associated with the systems selected.

Team Findings

The team identified a number of deficiencies and raised many significant questions with regard to the selected systems. As highlighted below, these include missing or inadequate design analysis, inadequate implementation or maintenance of the design basis, and deficiencies in the System Engineer Program:

1. Several examples of significant errors in design basis documents were identified:
 - o Significant calculations were missing. There were no calculations available for:
 - Sizing the essential chilled water or the essential cooling water surge tanks relief valves.
 - Supporting the design temperatures and pressures of the three systems.
 - Qualification of electrical cable supports in electrical cable trays for SSE conditions.
 - o Examples of inadequate design or modification calculations/assumptions were observed:
 - ANPP had made two calculation changes to diesel generator loading calculations and had not first corrected or taken into account inaccuracies in the original/initial calculations.
 - Battery sizing and diesel generator loading calculations contained non-conservatism and notable errors.
 - Sizing the essential cooling water system surge tank was based on one half the Rancho Seco design with no calculations.
2. Several examples were identified in which the design basis was not adequately implemented or maintained.
 - o Procedure and training were inadequate for the crosstie of the essential cooling water (safety) and the nuclear service water (non-safety) systems.

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- Addition of a chemical additive tank over the SP system, without considering seismic aspects in the 10 CFR 50.59 review.
 - Air Handling Unit Access Panel missing, poor condition of emergency lighting batteries, electrical cabinets with several cover fasteners missing. These are indicative of a less than adequate level of verification of proper maintenance activity completion.
3. System engineers lacked specific knowledge with regard to design basis, examples are:
- The failure of system engineers to identify the problems identified by the inspection team.
 - Lack of knowledge of various interface functions with other systems, e.g., essential cooling water system surge tank level setpoints, battery pilot cell selection.
 - Established training programs were not specific nor did they assure acceptable system engineer knowledge or retention.

A summary of significant, inspection team findings is set forth in Appendix B, herewith enclosed.

Conclusions

Based on these findings and the findings of the special inspection (50-528/88-07) related to the inoperability of the Auxiliary Feedwater Pumps, the team found that:

- ANPP has defined as a goal the establishment of a plant design basis document; however, ANPP has not been effective in implementing an engineering program to assemble a complete and accurate design basis document.
- ANPP has not been effective in establishing and implementing a System Engineering Program that accomplishes the goals laid out by ANPP.

The team concluded that these programs have drifted away from the original goals due to management inattention. We find this particularly vexing in light of our past discussions with you concerning these programs.

The number and types of problems noted is indicative of the need for additional and better focused management attention to design related activities. This conclusion is also reinforced by the findings of a special inspection related to the inoperability of the Auxiliary Feedwater Pumps. In that inspection, we found that the problem of changing limit switch

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setpoints inconsistent with component design function, could have been found and corrected by responsible personnel during any one of many opportunities. Similarly, the SSFI found examples of inadequate implementation of the design basis throughout the ANPP organization. In this regard, the team had several discussions with licensee management personnel. These management personnel shared this concern and noted that efforts have already been initiated to enhance performance in this area.

As previously stated, the team concluded that the design basis program and the system engineer program strayed substantially from the objectives stressed to us over the last several years. Further, the team determined that the root causes of this divergence were that (1) management had not effectively established and communicated their expectations related to the Technology Transfer and the System Engineer Programs, and (2) management had not assured implementation of the design basis into plant activities, e.g., operations, maintenance, surveillance, and training. Specifically, management had not provided and assured a clear understanding of (1) what is an acceptable design basis document, (2) what is an acceptable design basis technical review, and (3) what are the knowledge level and responsibilities for engineering personnel to establish and maintain the design basis. Finally, the team concluded that management must assure that their expectations are implemented through management overview, quality audits, and other independent assessments.

During the team exit meeting, you acknowledged the team's conclusions relating to design and design control deficiencies and described several planned actions to correct these deficiencies. You further clarified your intentions during an ANPP/NRC Management Meeting held on February 29, 1988. The team understands that these actions are intended to: (1) consider design basis information and calculations associated with plant systems and provide additional assurance that this information is accurate and complete with particular emphasis on the Technology Transfer Program; (2) audit plant activities and confirm that these activities reflect accurate, technically sound design basis information; (3) provide improved programs and control over all organizations implementing design basis requirements, particularly with regard to the System Engineer Programs, and (4) provide additional management overview of the technical aspects of design and modification activities including independent assessment of those activities.

You are encouraged to assign priority to efforts to improve your performance in this area. Additionally, we would request that you please provide a detailed written description of your action plan to improve performance in this area. Specifically, we would suggest that you perform a thorough reappraisal of the design basis program as well as the system engineer program. This reappraisal should include your evaluation of the root cause(s) as to why the programs have not completely implemented management's objectives and intentions, and assure that there is a clear, mutual understanding of your objectives by all involved. We anticipate periodic meetings with you and your staff to discuss the status of your actions to address the basic problems identified in this inspection.

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Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. Your response to this Notice is to be submitted in accordance with the provisions of 10 CFR 2.201. In addition to your response to the Notice of Violation, please provide your assessment of the apparent deficiencies identified as unresolved items in the enclosed report, including any corrective actions taken or planned.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room.

The responses directed by this letter and the attached Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,

Original Signed
J. B. Martin
Regional Administrator

Enclosures:

1. Appendix A, Notice of Violation
2. Appendix B, Summary of Significant Findings
3. Inspection Report No. 50-528/88-01

cc w/enclosures:

J. G. Haynes, ANPP
W. F. Quinn, ANPP
R. Papworth, ANPP
L. Souza, ANPP
T. D. Shriver, PVNGS
W. E. Ide, PVNGS
C. N. Russo, PVNGS
J. Morrison, PVIF
L. Bernabei, GAP
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bcc w/enclosures:
 RSB/Document Control Desk (RIDS) (IE01)
 D. Persinko, NRR
 Project Inspector
 Resident Inspector
 G. Cook
 B. Faulkenberry
 J. Martin
 Docket File

bcc w/o enclosures 2 and 3:
 LFMB
 M. Smith

Region V/norma

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AJohnson 3/30/88	AChaffee 3/30/88	DKirsch 3/30/88	JMartin 3/30/88

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