



90-42

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

DEC 27 1990

Docket Nos. 50-528, 50-529, and 50-530

Arizona Public Service Company
P. O. Box 53999, Station 9012
Phoenix, Arizona 85072-3999

Attention: Mr. W. F. Conway
Executive Vice President, Nuclear

Gentlemen:

Subject: NRC Inspection of Palo Verde Units 1, 2 and 3

This refers to the electrical distribution system functional (EDSFI) team inspection conducted by Mr. C. W. Caldwell, and other NRC and contractor personnel from October 1 through November 9, 1990, and review of additional licensee provided information through November 23, 1990, involving activities authorized by NRC License Nos. NPF-41, NPF-51 and NPF-74, and to the discussion of our findings held by the inspectors with members of the Arizona Nuclear Power Project staff at the conclusion of the inspection on November 9, 1990.

Areas examined during this inspection are described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of electrical distribution system (EDS) design calculations, relevant procedures and representative records, installed equipment, interviews with personnel, and observations by the inspectors.

Based on the results of this inspection, it appears that several 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 Part 2.201, as stated in Appendix A, Notice of Violation.

We are particularly concerned with deficiencies related to calculations supporting the adequacy of the electrical distribution system (EDS). Specifically, the inspection team noted a number of examples where the original design calculations were either missing or inadequate to demonstrate the adequacy of the EDS design to meet General Design Criteria (GDC) 17 requirements under worst case conditions. For example, the effects of the addition of non-Class 1E loads (40 MVA) being automatically transferred from the unit auxiliary transformer to the startup transformer on a fast bus transfer and the effects of this additional load on the evaluated voltages to safety related components were not considered. Subsequent APS calculations, performed in response to the team findings, confirmed that the EDS design will satisfy the requirements of GDC 17, with the exception of the following case.

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It appears that the offsite power system was not designed to preclude the simultaneous failure of both sources when the three units are powered from two startup transformers and a fast bus transfer of non-Class 1E loads from the unit auxiliary transformer to the startup transformer occurs in one unit with another unit in startup. In response to the team finding, APS identified five occasions in which the rating for the secondary winding of at least one startup transformer would have been exceeded if a reactor trip, turbine trip, or loss of coolant accident had occurred in one of the units. On one of these occasions, excess current may have occurred on the secondary of two startup transformers that were supplying power to Unit 2 if one of the above scenarios had taken place. This may have resulted in a loss of both offsite power sources to Unit 2. As a result, administrative controls for the loading of the startup transformers were implemented by the licensee.

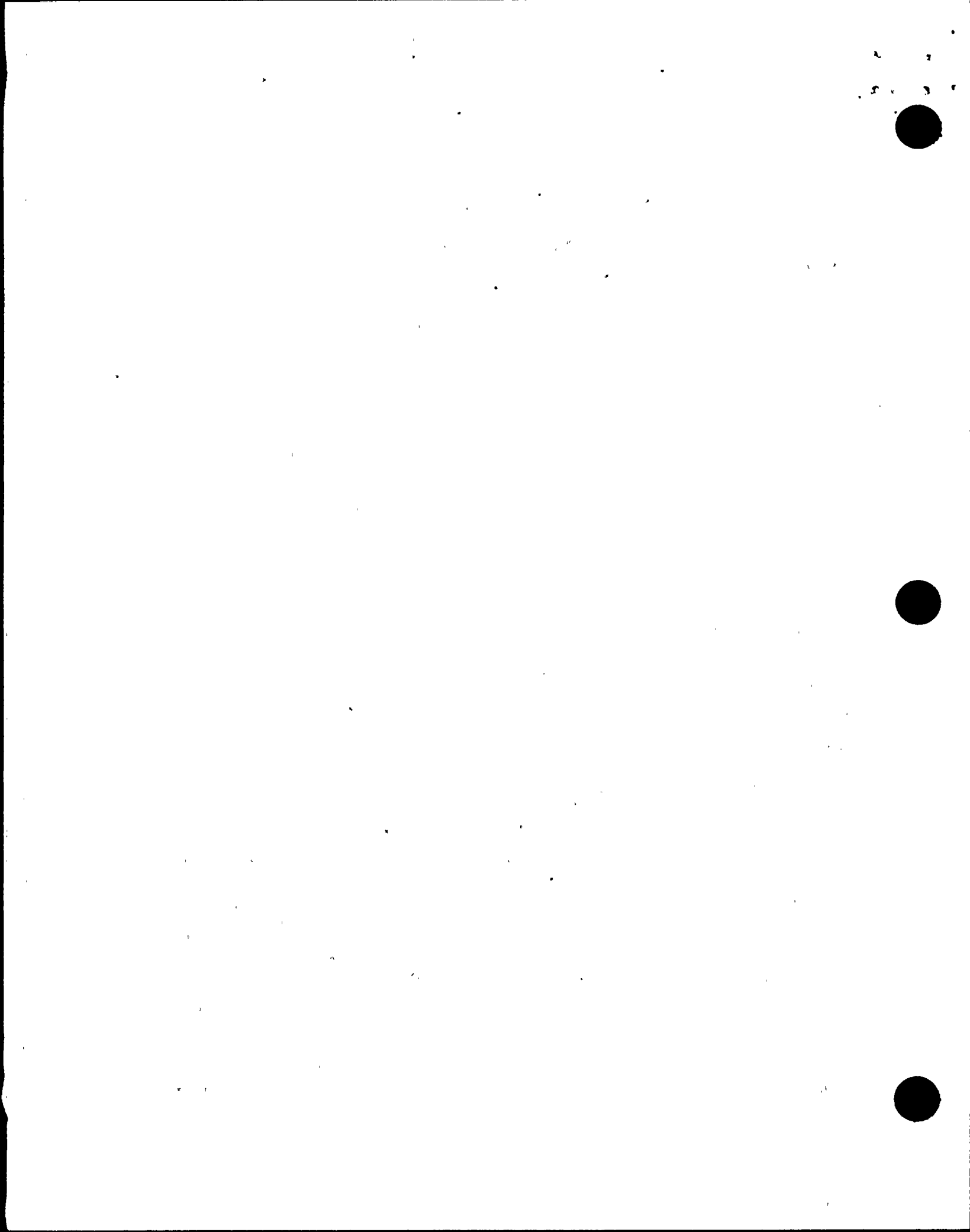
The team also noted several examples of errors in original design calculations. For example, non-conservative load values were used for a load center and a calculation involving a plant design modification on the spray pond system had the wrong information concerning the maximum spray pond level. During the exit meeting, the team emphasized that since APS has not yet performed a great deal of design modification work, now is a significant opportunity to correct current and past design control weaknesses which have allowed deficiencies, such as those noted by the team, to occur.

We understand that a design basis reconstitution effort is in progress and that APS intends that calculation problems such as those noted by the team will be identified and corrected by this effort. However, we also note that although APS has completed electrical systems reliability assessments, these efforts failed to identify the significant discrepancies noted by the team. In this regard, we consider that current and future efforts should be performed with more careful attention to detail and that efforts should specifically challenge and confirm the original design assumptions. In addition, integration of the NRC team's inspection findings should be factored into your efforts. Due to the significant problems noted, it is requested that you provide an appraisal of why these discrepancies were not identified in any of your previous EDS assessments.

The inspection team noted that relatively little design margin remains on the diesel generators and other components. Accordingly, we also encourage you to better integrate the various engineering and quality oversight functions to enhance performance in the engineering and technical support area, to ensure that adequate EDS design margins continue to be maintained. We will review your corrective actions in response to the Notice of Violation and your continued program enhancements during future inspections.

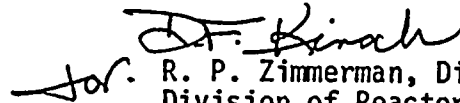
In accordance with 10 CFR Part 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedure 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 pleased to discuss them with you.

Sincerely,


for. R. P. Zimmerman, Director
Division of Reactor Safety
and Projects

Enclosure:

1. Appendix A - Notice of Violation
2. Inspection Report Numbers 50-528/90-42, 50-529/90-42, and 50-530/90-42

cc w/enclosures:

Mr. Jack N. Bailey, APS
Mr. Blaine E. Ballard, APS
Mr. Thomas R. Bradish, APS
Mr. O. Mark DeMichele, APS
Mr. James M. Levine, APS
Mr. Robert W. Page, APS
Mr. E. C. Simpson, APS
Mr. Arthur C. Gehr, Esq., Snell & Willmer
Mr. Al Gutterman, Newman & Holtzinger, P. C.
Mr. Charles R. Kocher, Esq., Assistant Council, SCE Company
Mr. James A. Boeletto, Esq., SCE Company
Mr. Charles B. Brinkman, Combustion Engineering, Inc.
Mr. Charles Tedford, Director, Arizona Radiation Regulatory Agency
Chairman, Maricopa County Board of Supervisors
Mr. John W. Norman, Chief, Arizona Corporation Commission



bcc w/enclosures:
Docket File
Resident Inspector
Project Inspector
G. Cook
B. Faulkenberry
J. Martin
A. Johnson

bcc w/o enclosure 2:
N. Western, J. Zollicoffer
M. Smith

REGION <i>V//memo</i>	<i>H memo</i>			
CCaldwell <i>H</i>	FGee <i>H</i>	DAcker	AJohnson <i>H</i>	RHuey <i>H</i> * Full ltr NOV + 12/26/90 <i>exc summary only.</i>
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REQUEST COPY	REQUEST COPY	REQUEST COPY	REQUEST COPY	REQUEST COPY
YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

K
DFKirsch
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RZimmerman
12/21/90

N. Della Grecca
12/21/90
Della Grecca

A.S. Santam/Adicon
12/24/90

REQUEST COPY	REQUEST COPY
YES / NO	YES / NO

SEND TO PDR
YES / NO

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