



Arizona Nuclear Power Project

P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

RECEIVED
NRC
REGION V
1987 OCT 14 A 11:09

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

022-00595-EEVB/WEI/TCS
October 12, 1987

U. S. Nuclear Regulatory Commission
Region V
1450 Maria Lane - Suite 210
Walnut Creek, California 94596-5368

Attention: Mr. Dennis F. Kirsch, Director
Division of Reactor Safety and Projects

Reference: NRC Letter from Dennis F. Kirsch to E. E. Van Brunt, dated
September 25, 1987

Dear Mr. Kirsch:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
EE580 Program Allegation No. RV-87-A-047
File: 87-001-350

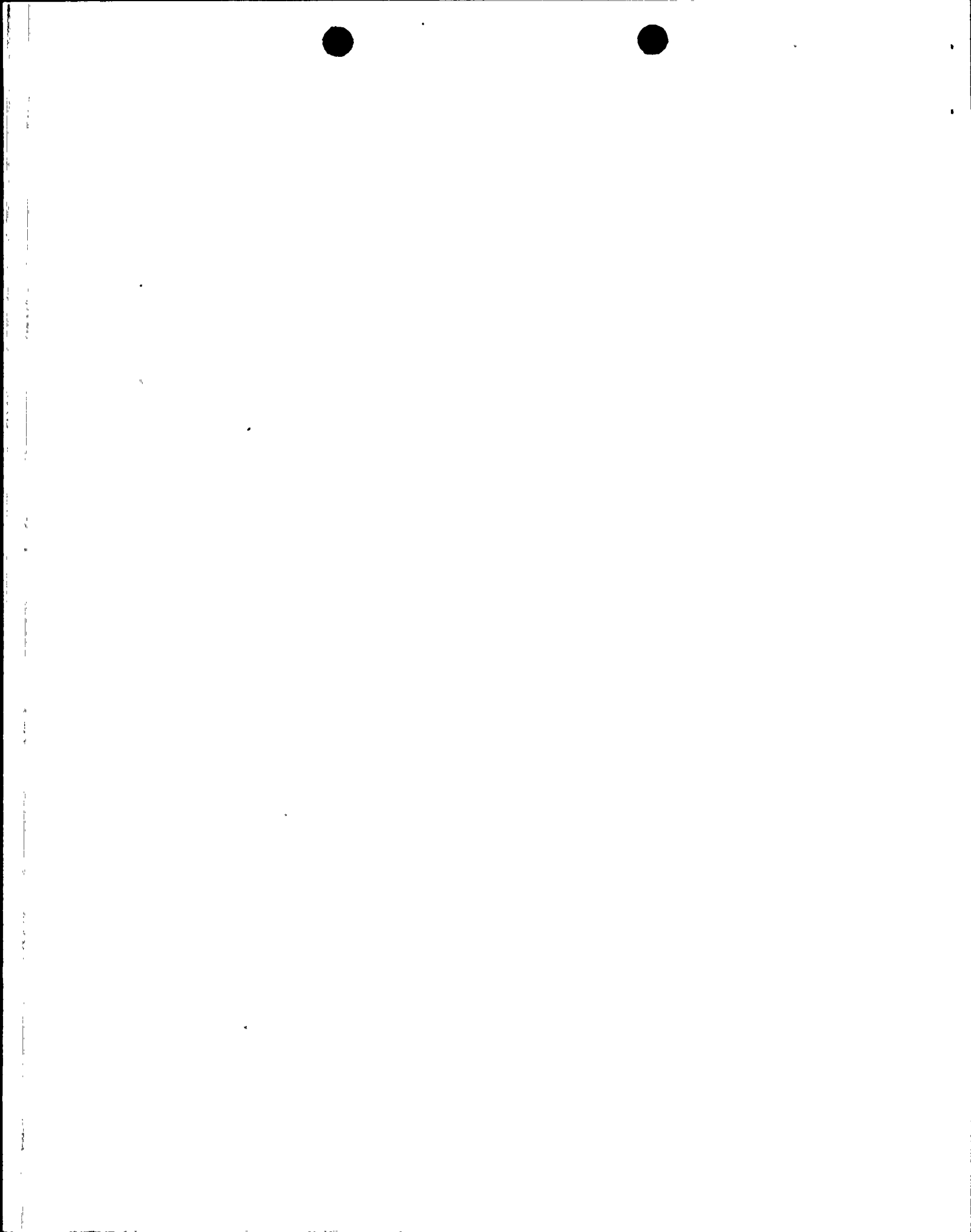
1987 OCT 26 A 9:52
USNRC-DS

Arizona Nuclear Power Project (ANPP) has investigated Allegation No. RV-87-A-047 concerning scheduling of Raceway Modifications, review and completeness of applicable Modifications and engineer knowledge of the EE580 Program, as requested by the referenced letter. This investigation was conducted by performing a review of a sample of Electrical Design Change Packages for Raceway Modifications, performing a walkdown of a sample of Electrical Modifications to verify configuration and comparing the EE580 Data Base to a sample of as-built documents/field installations.

A review of the investigation results has determined that the Design Change Packages contain sufficient information to verify technical adequacy of design and that appropriate design reviews were completed. Additionally, it was determined that the Palo Verde electrical configuration has been controlled and can be determined through the EE580 Program and associated as-built/installation records. The investigation also determined that administrative deficiencies have occurred in the processing of Electrical Design Changes and supplemental training in the EE580 Program is required. Action is being taken to correct these deficiencies. The attached Report summarizes the investigation methods, results, associated enhancements and corrective actions covering Electrical Modifications and the EE580 Program. Additional documentation associated with this investigation is available for review at Palo Verde Nuclear Generating Station (PVNGS).

8710270143 871012
PDR ADDCK 0500052B
Q PDR

111 IE-01




Mr. Dennis F. Kirsch
Page 2

022-00595-EEVB/WEI/TCS
October 12, 1987

If you have questions concerning this investigation or need additional clarification, please contact Mr. W. E. Ide.

Very truly yours,

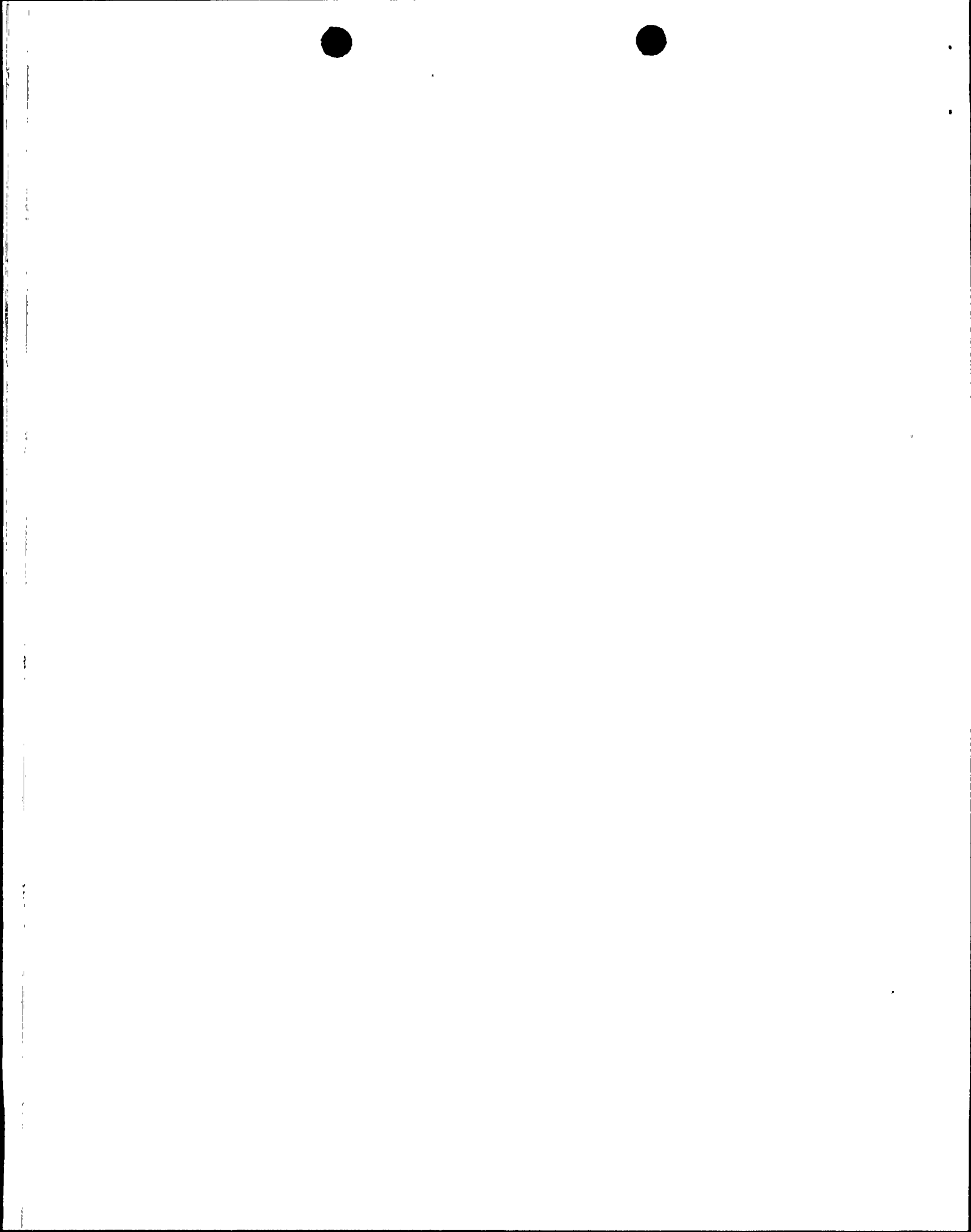


E. E. Van Brunt, Jr.
Executive Vice President

EEVB/WEI/TCS/kw

Attachment

cc: O. M. DeMichele
J. G. Haynes
A. C. Gehr
J. Ball



ANPP CORPORATE QA/QC
QUALITY INVESTIGATION REPORT
QA HOT LINE FILE NO. 87-075

INVESTIGATION SCOPE

The NRC requested ANPP to investigate the below listed allegation during a phone conversation between D. F. Kirsch and W. E. Ide on September 18, 1987 and subsequently by letter from D. F. Kirsch to E. E. Van Brunt on September 25, 1987.

Allegation RV-87-A-047

"There is a lack of completeness of site modifications in the scheduling of raceway installations per the EE580 program. In particular, this exists in the areas of security and I&C. Also, there appears to be a lack of interdisciplinary review of site modifications. Finally, engineers lack a sufficient knowledge of the EE580 program."

Palo Verde Nuclear Generating Station Procedure 73AC-9ZZ28, paragraph 3.1.3, defines Site Modification as ". . . authorizing document allowing plant changes which require limited engineering and development on site." Although the allegation specifically questioned the completeness and review of electrical Site Modifications, the investigation was broadened to investigate both Site Modifications and other electrical changes which were completed during the period 1985 to present. This action was taken as a result of the September 18, 1987 phone conversation between D. F. Kirsch and W. E. Ide during which Mr. Kirsch indicated the investigation should not be limited to "Site Modifications."

INVESTIGATION METHODOLOGY

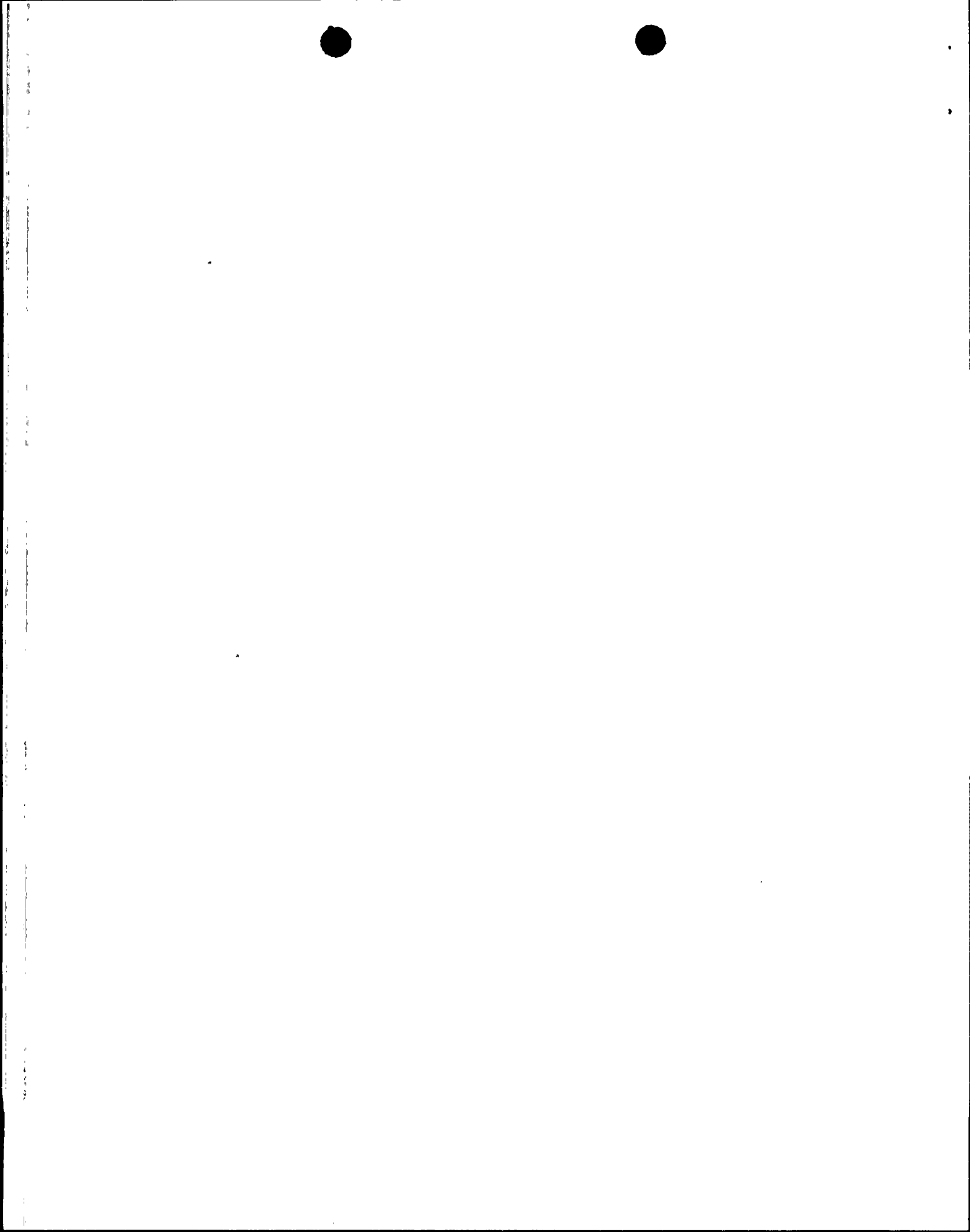
To investigate the allegation, a sample of electrical Design Change Packages (DCPs), Site Modifications (S-Mods), and changes, e.g., Modification Sheets (Mods) and Field Change Requests (FCRs) were reviewed; the EE580 data base, as installed condition and installation records were compared; and interviews were conducted.

There have been approximately one thousand (1000) DCPs completed during the period 1985 to present. A review of the DCP subjects indicate that approximately one hundred four (104) modified raceway. There have been approximately forty-nine (49) Site Modifications completed during this period with approximately sixteen (16) in the area of Security or I&C. These numbers were used to select DCPs and Site Modifications to receive additional review.

Scheduling

Scheduling of raceway has two possible meanings; one concerning routing of the raceway and the other concerned timeliness of raceway installation. To ensure both these meanings were considered, the following investigation was conducted.

1. One hundred percent (100%) of all Design Change Packages (eighteen) pertaining to electrical modifications that were issued more than a year ago and still remain active were reviewed to determine the reason each was open.

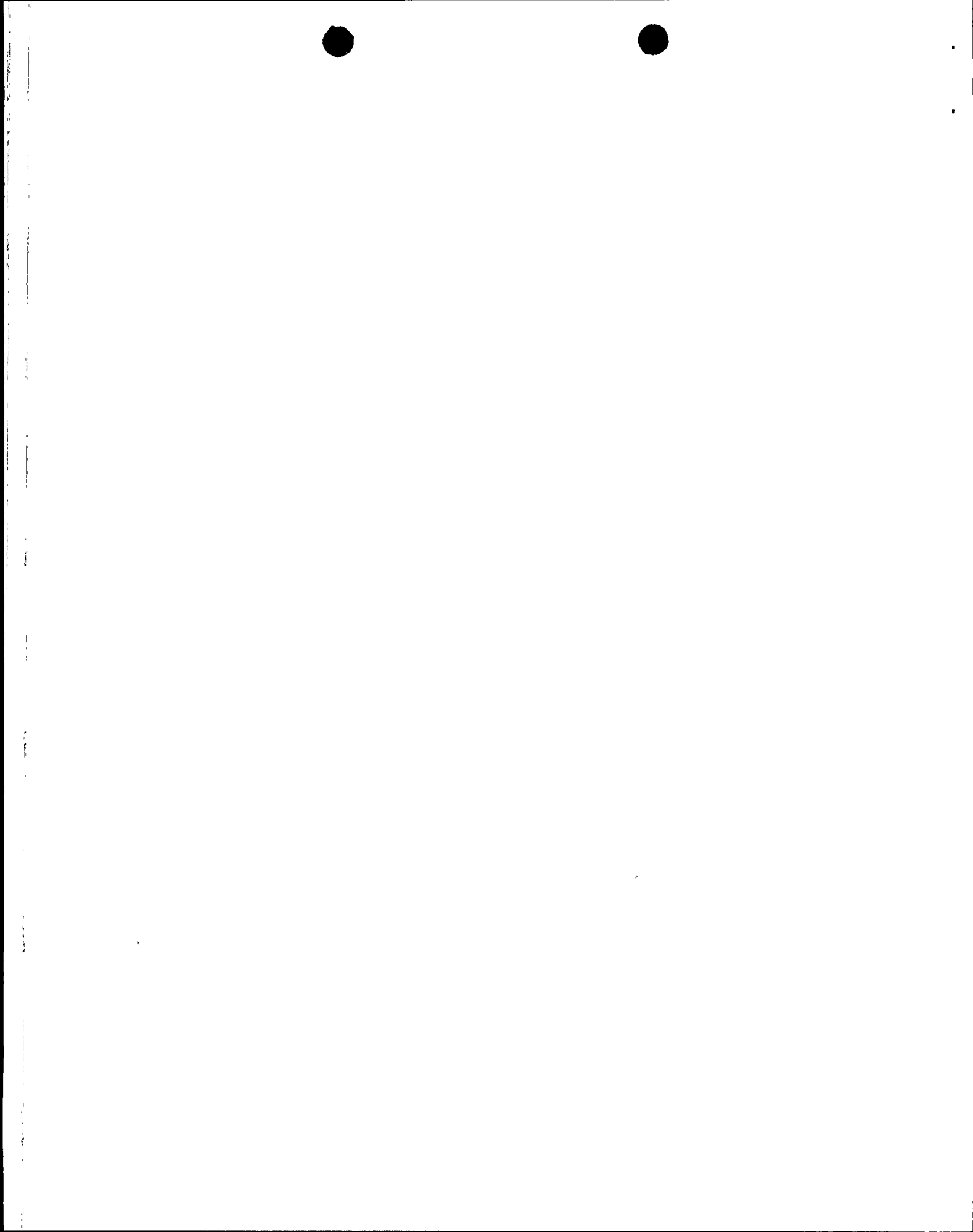


2. Physical walkdowns were conducted on forty-three (43) raceway selected from nineteen (19) DCPs. These walkdowns verified:
 - a. Raceway number.
 - b. To and from location per EE580 card.
 - c. Correct size of raceway per EE580 card.

Design Change Adequacy

To verify electrical design changes were complete and received the proper level of interdisciplinary review, the following investigation was conducted:

1. A review of all sixteen (16) completed Site Modifications within the Electrical and I&C disciplines was conducted. The subject Site Modifications entailed work in various areas, four (4) of which fell within the area of Security. To assure the subject sixteen (16) Site Modifications were in compliance with administrative site requirements, the following attributes were verified:
 - a. Multidiscipline reviews satisfactorily completed.
 - b. Verification that Field Change Requests (FCRs), Design Change Notices (DCNs), Supplier Change Notice (SCNs) and Supplier Document Change Notices (SDCNs) were incorporated into the appropriate design drawings and/or field revision log as applicable.
 - c. Technical review checklist completed.
 - d. Technical input checklist completed.
 - e. As built verification checklist completed.
 - f. Nuclear Safety Review (50.59) completed.
 - g. Inservice and final closure checklist completed.
2. An in-depth technical review was conducted for three (3) Electrical/I&C Site Modifications (approximately 20%) to verify that sufficient technical justification existed for the modification.
3. The sixteen (16) completed Site Modifications did not involve more than one discipline to accomplish the task. To adequately address multidiscipline review of Site Modifications, three (3) additional packages were examined that required Mechanical, as well as Electrical, evaluation.
4. Twenty-four (24) DCPs, twenty-three percent (23%) of the subject population, were reviewed to verify compliance with administrative control procedures, including verification that each package contained:

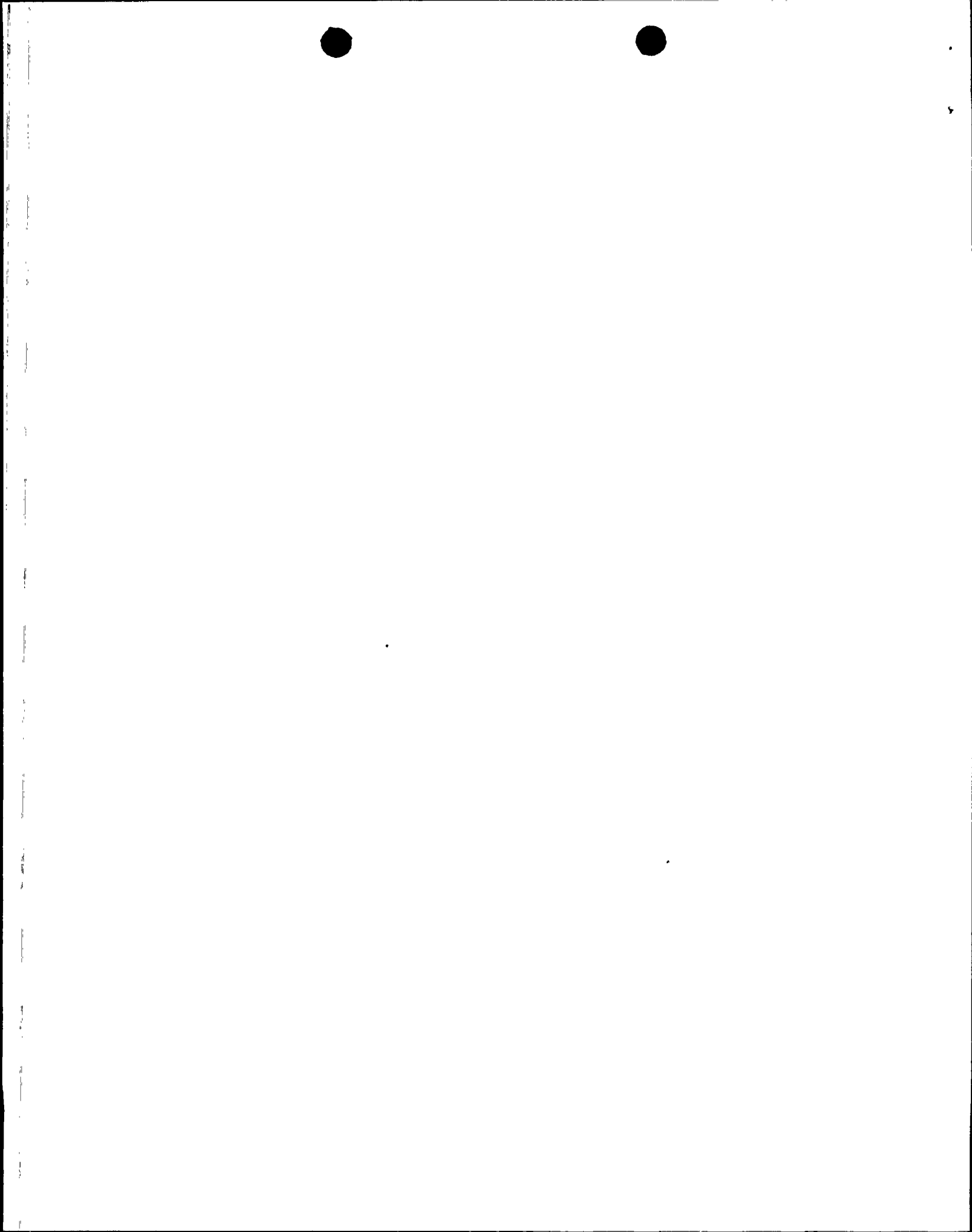


- a. DCP Information Sheets
- b. Configuration Document Checklist
- c. Design Change Basis
- d. Safety Significance Assessment
- e. DCP Checklist
- f. Environmental Permit Requirements

Configuration

Since the alleged deficiencies, particularly inadequate knowledge of the EE580 system, could result in loss of Configuration Control, overall Electrical configuration control was verified by:

1. Verifying the installed field configuration, EE580 data base and installation/inspection documents agreed. For nineteen (19) of the twenty-four (24) DCPs reviewed above, raceway, cable and termination installations were selected for verification. All installations were verified for small DCPs. Ten (10) installations were verified for larger DCPs. One hundred eight-six (186) total installations were selected including forty (40) cable, forty-three (43) raceway and one hundred three (103) termination. For each of these installations the EE580 data base was compared to the installation/inspection records. One hundred seventeen (117) were physically verified.
2. A review was conducted to verify that modifications to existing DCPs were controlled in accordance with procedure. The review of the one hundred four (104) DCPs indicated that eighty-three (83) DCPs had modification sheets. Of these eighty-three (83), only three (3) had modifications involving changes to EE580. The three (3) modifications were reviewed to verify:
 - a. FCRs and DCNs were incorporated into the appropriate design drawings and/or field revision log as applicable.
 - b. Hand written EE580 and computer EE580 cards were in agreement.
 - c. Configuration of EE580 data base and computer EE580 card agree.
 - d. The EE580 card reflected final Area Field Engineer (AFE)/Quality Control Inspector (QC) acceptance including date.
 - e. The design documents were in agreement with EE580 card.
 - f. The EE580 design in all three units were physically verified.
3. A sample of instances were selected, where the EE580 data base indicated that further installation remained to be completed.



- a. A random sample of thirty-five (35) termination EE580 cards in the vault, (19 Quality Class and 16 Non-Quality Class) were compared to the current EE580 data base for correctness of termination points and equipment numbers.
- b. A random sample of thirty-four (34) raceway EE580 cards in the vault (32 Quality Class and 2 Non-Quality Class) were compared to the raceway size (if applicable) and "to and from" locations utilizing the current EE580 data base.
- c. A random sample of nineteen (19) cable EE580 cards (14 Quality Class and 5 Non-Quality Class) were reviewed. The review entailed matching the cable codes and "to and from" locations utilizing the current EE580 data base and the most current EE580 card in the vault.

Training

To assess the adequacy of training in regards to the EE580 system, an analysis was performed of deficiencies identified in the investigation to determine whether incomplete training could be a cause of error. Additionally, the training program for the EE580 system was discussed with each Engineering group Manager/Supervisor who had responsibility for electrical design.

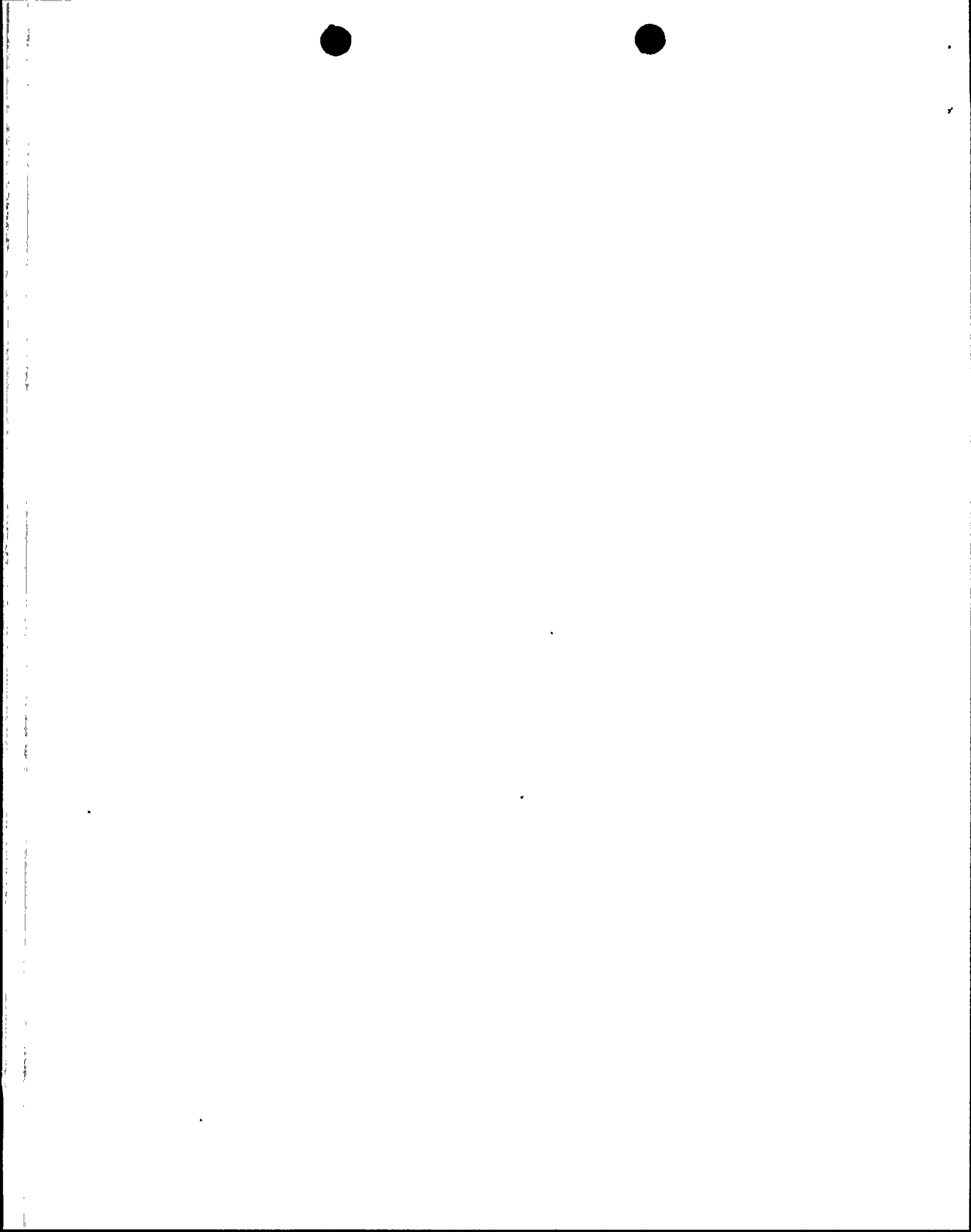
INVESTIGATION RESULTS AND CORRECTIVE ACTION

Scheduling

A review of all eighteen (18) electrical DCPs open more than one (1) year did not identify any unwarranted time delays due to personnel inattention. The DCPs had not been completed/closed for the following reasons:

<u>DCP Status</u>	<u>Quantity</u>
Scheduled for Unit 1 Refuel Outage	3
With Nuclear Engineering for DCP Modification	2
With Site Engineering (Software Problems)	2
Working in field	2
On hold with planning (Material on order)	1
DCP scheduled for 1988 (System availability)	1
Construction complete, documents in review	7

No errors were found in the routing of raceways.



Design Change Adequacy

The review of DCPs and Site Modification packages for completion and adequacy revealed several administrative deficiencies and some inconsistencies between procedures, as well as a lack of timeliness in the closure of Site Modifications and updating of vendor drawings. Interdisciplinary reviews were found to have occurred as required.

The review of Design Change Packages for completeness revealed that Bechtel generated DCPs did not contain a Design Change Checklist capable of demonstrating compliance to ANSI N45.2.11. This deficiency had been identified/evaluated and resolved in response to Corrective Action Request CA85-252 as of April, 1986. A review of Bechtel generated Design Change Packages issued since April 1986 indicated that the required documentation was complete.

A possible procedural inconsistency was identified in that the procedure for Site Modifications require the generation of Field Change Requests to change the EE580 data base but does not include the requirement to generate an EE580 Input Sheet. This inconsistency was found to have no effect on the accuracy of the EE580 system as there is only one EE580 Coordinator for updating the data base. However, to insure procedures are consistent, Nuclear Engineering will evaluate and recommend changes to procedures by November 10, 1987.

A review of Site Modifications revealed that the design package is technically adequate and complete. However, two discrepancies were identified.

1. The following Site Modifications contained SDCNs which were not incorporated into applicable design drawings within sixty (60) days as required by project procedures:

1-SM-SQ-001	2-SM-SA-002	3-SM-RK-003
2-SM-FP-004	3-SM-SQ-003	

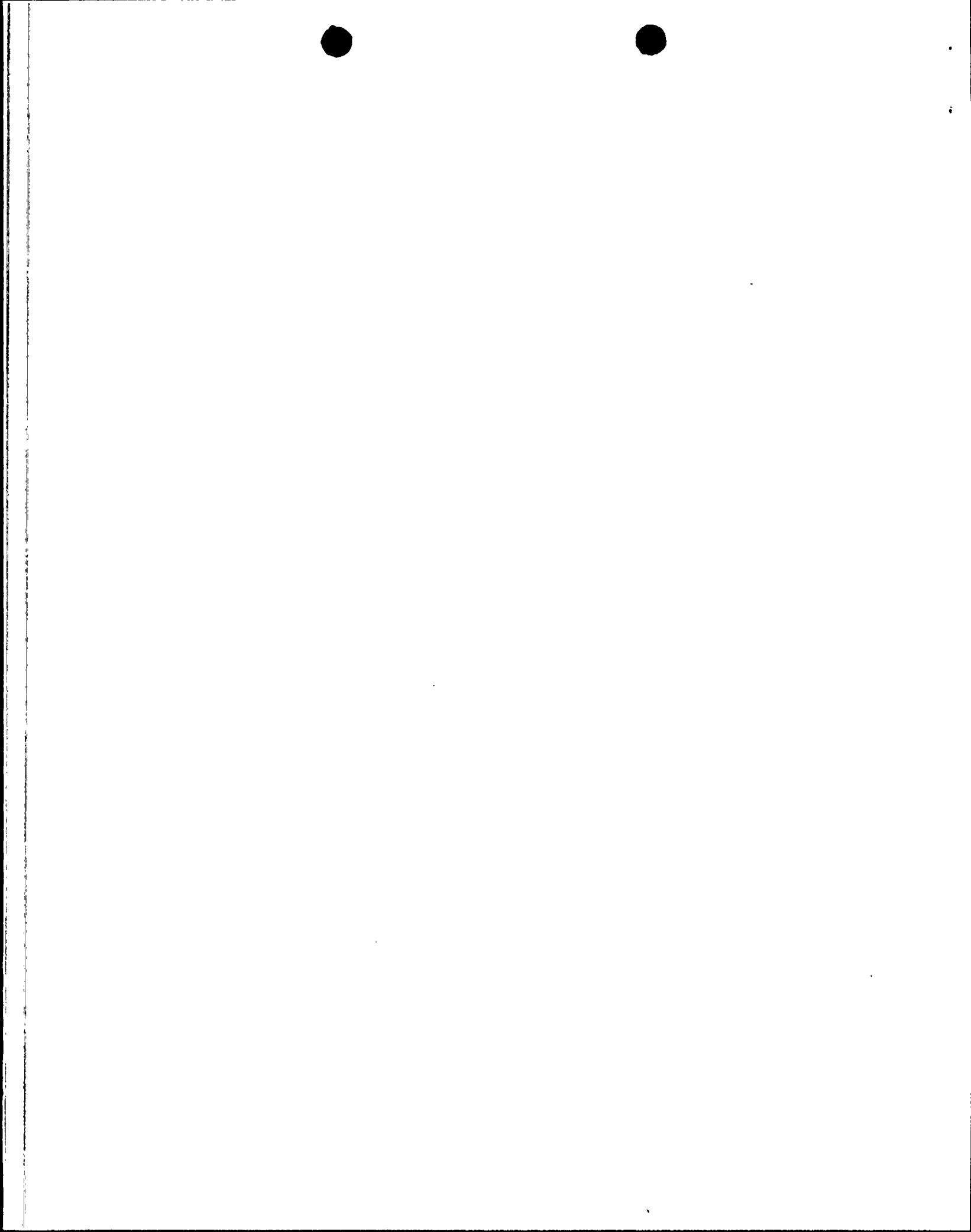
Review of Site Modifications with outstanding SDCNs indicate that no safety impact on the plants exist as outstanding Site Modification SDCNs are listed in the Field Revision Log (FRL).

To incorporate SDCNs in vendor drawings, Nuclear Engineering has committed to issue a change to an existing contract to include the incorporating of SDCNs. This ammendment is scheduled to be completed by November 10, 1987.

2. The following Security Site Modifications are "Construction Complete" (CC) but have outstanding "Site Impact Review (SIR) forms preventing final closure.:

S-Mod No.

A-SM-ZY-003	A-SM-SK-004	3-SM-QC-004
-------------	-------------	-------------



Outstanding SIRs do not have a direct impact since documents required to operate a system are updated prior to declaring a system operable. However, the lack of a completed SIR may indicate that related documents have not been updated. In this particular instance, the completion of SIRs was made more difficult since the Site Modifications are classified as "Safeguards".

Independent of this review the procedure to perform Site Modifications had been strengthened to require SIRs to be completed within fifteen (15) working days. The Configuration Control Group (CCG) has been assigned the responsibility to ensure SIRs are completed in a timely manner.

Cross discipline review of Site Modifications, as applicable, is required by Procedure No. 73AC-9ZZ31 (Technical Input and Review) and documented on the technical review checklist included in each Site Modification package. The Supervisor/Lead is required to verify that the applicable cross discipline review had been accomplished before approving the Site Modifications. No problems were noted in this area during the review of Site Modifications.

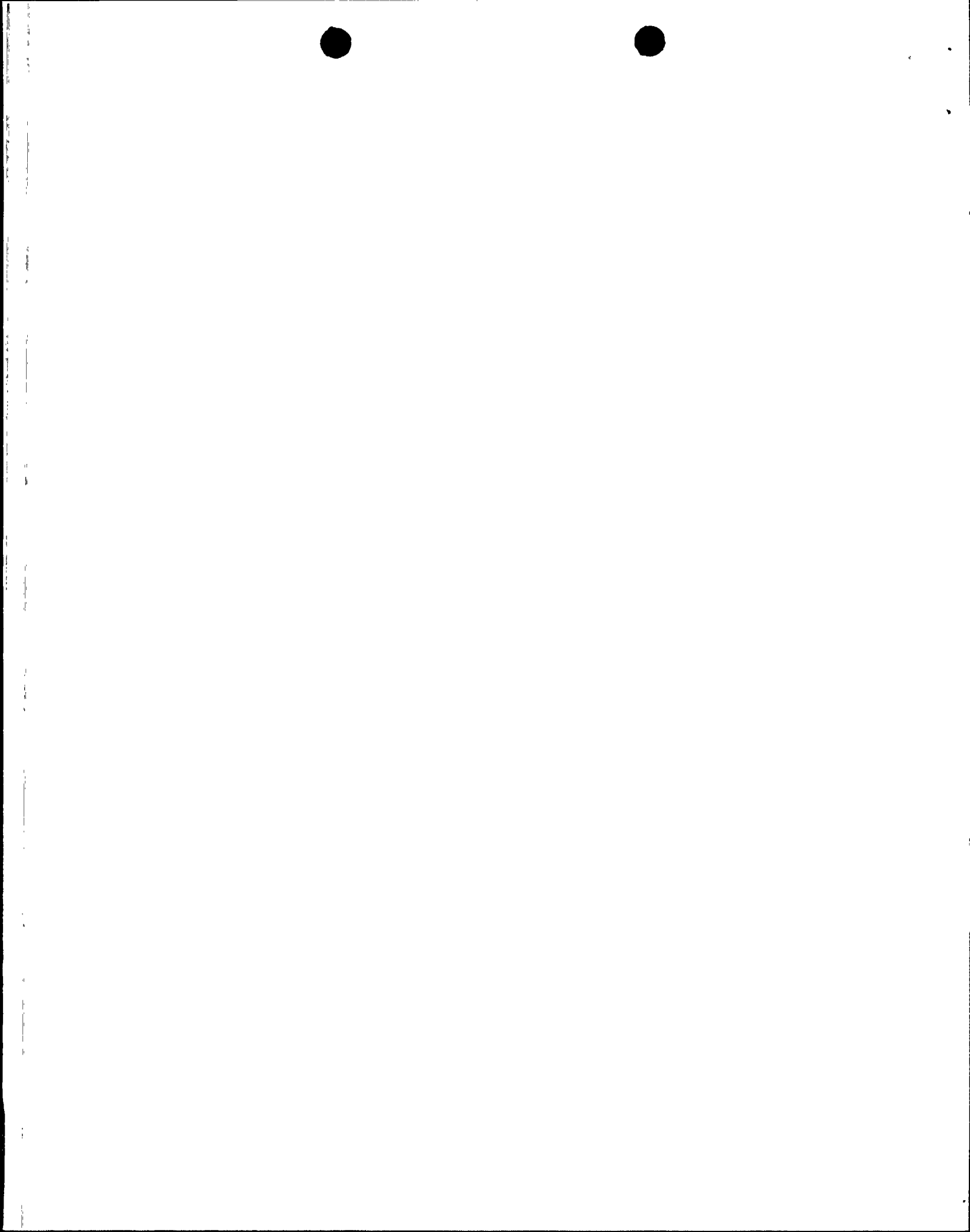
Two (2) deficiencies in updating drawings were identified:

1. DCN No. 10 to drawing 13-E-PBB-004, Rev. 12, was not incorporated correctly for cable 1EPB04BC1RM, and termination 1EPB04BC1RM2. Equipment No. 1JRMBB01D was incorrectly listed as 1JRMNB01D. Engineering Evaluation Request No. 87-PB-008 has been initiated to correctly update the subject equipment number on the applicable design drawing. This deficiency has been determined not to be safety significant and has no safety impact.
2. Cable terminations 2EZJ03AC1KM1, 3EZJ03AC1KM1 and 3EZJ06BC9KM1 were not actually incorporated into drawings 13-E-PKA-003 and 13-E-PKA-006 by the applicable DCN No. 13, but rather by the DCP itself. DCN No. 13 addressed comments only. Since the drawing is correct, no further action is necessary.

CONFIGURATION

During the comparison of the EE580 data base to installation/inspection records and to the physical plant, several deficiencies were identified. These deficiencies were evaluated as to their effect on configuration control. It was determined that configuration control had been maintained as long as the EE580 data base is used in conjunction with installation/inspection records and outstanding DCPs.

During the review of two hundred eighty-three (283) conditions, the following deficiencies were identified:



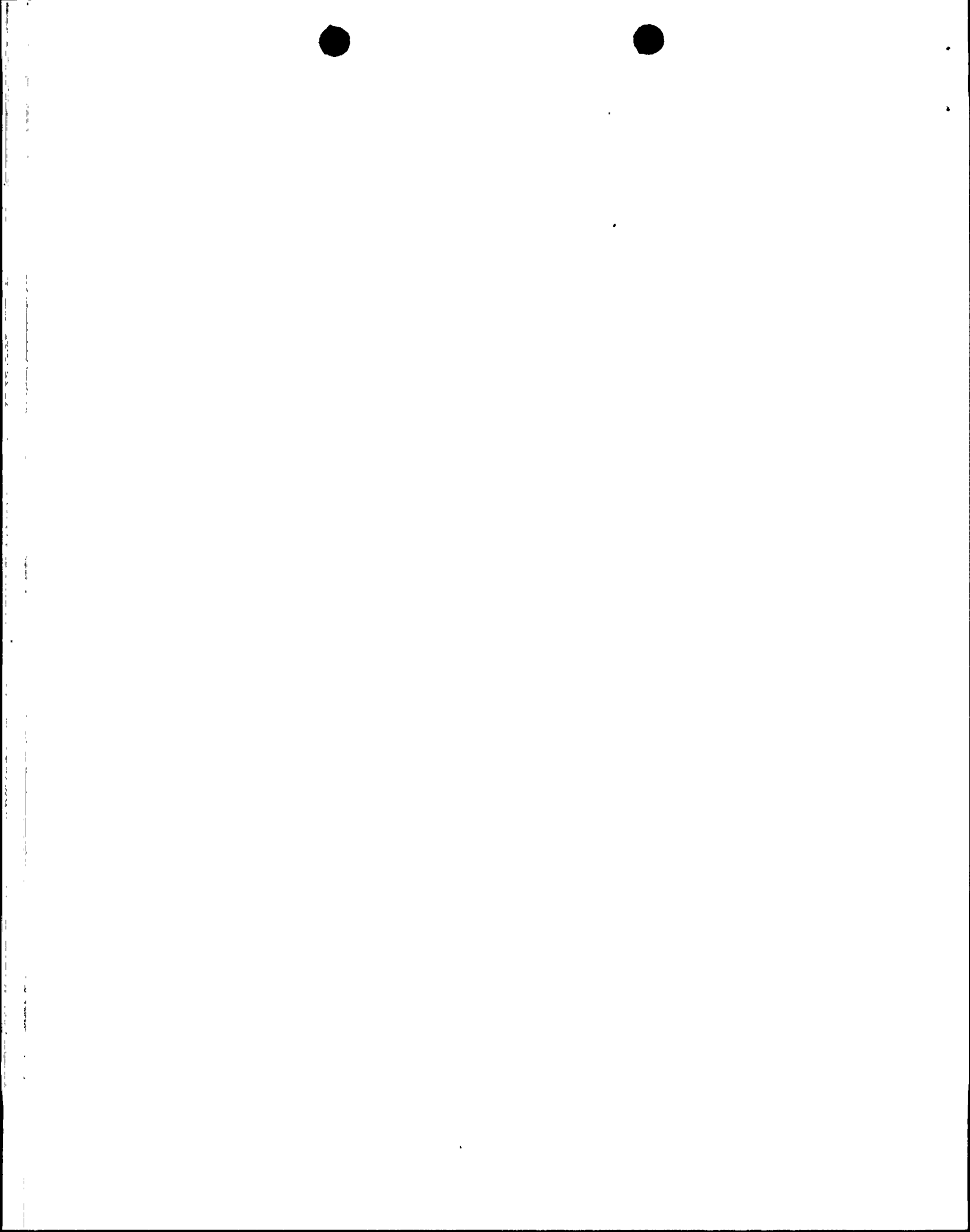
1. In forty-seven (47) cases, inspection records have been lost/misplaced. Since the work document is closed, and that closure requires a verification that the installation/inspection records were complete, there is evidence that the required work was performed and inspected. This deficiency has no effect on plant safety.
2. In three cases, the EE580 cards do not reflect the actual field condition. Engineering Evaluation Request (EER) Nos. 87-IA-020, 87-SQ-249, 87-SS-026 were initiated to evaluate this condition. All three (3) EERs have been dispositioned and indicate that no safety significant conditions exist.
3. In sixty-one (61) cases, installation has been completed, but the EE580 data base indicates the work remains to be completed.
4. In one case, no work implementing document could be located but, field installation in the field has been completed. No safety significance was noted as the actual field condition did reflect the DCP change.
5. A hand written EE580 card was in the vault, without a computer generated card, and the EE580 data base had been updated. This is a procedural implementation deficiency only since the EE580 data base, inspection record and plant configuration all agree.

The EE580 data base indicates by a *C in the data base when work remains to be performed to make the plant configuration conform to the data base, e.g., there is a design change which has been approved for installation but not installed. In this situation, an Engineer must review completed installation/inspection records to determine the actual plant configuration prior to performing an engineering function. This is the manner EE580 was designed to be used. Based on the review of two hundred eighty-three (283) conditions, only four (4) indicated that the as-installed condition differs from the design and/or installation records. These conditions have been determined not to be safety significant. Configuration control has been maintained. However, since a significant number of *C conditions exist in the EE580 data base, using the data base is time consuming.

To enhance the usefulness of the data base, Nuclear Engineering will perform an analysis and develop a plan and schedule to update the EE580 data base. The plan will include a comparison of the data base with outstanding EE580 cards and update the data base when installation has been completed as indicated by installation/inspection records. The analysis requirements to complete this action will be completed by Nuclear Engineering by November 1, 1987.

Training

To assess the adequacy of training the deficiencies identified were reviewed. This review indicates the need for either clearer procedures or additional training. Additionally, the current method and need for training was discussed with Supervisors/Managers in the Engineering groups having responsibility for electrical design.



From this discussion it was determined that prior to this time, minimal formal training has been conducted in EE580. Within Operations Engineering there is an EE580 Coordinator who previously worked for Bechtel and is very knowledgeable in EE580. Nuclear Construction had, prior to this investigation, identified the need for training on EE580 and the applicable procedure is being added to the required reading list. Similarly, Nuclear Engineering had identified the need for additional EE580 training and had authorized Bechtel Technology Transfer Course NNE17.00 in this area. Twelve (12) electrical engineers completed this course on October 7, 1987.

Because of the deficiencies identified by the investigation, additional training will be conducted. This training will occur after the procedures have been reviewed and inconsistencies corrected. Nuclear Engineering has been assigned the responsibility to review the procedures, complete revisions, and prepare the training material. This action is scheduled to be completed by December 31, 1987. Training is scheduled to be completed by February 28, 1988.

As an interim measure, a Quality Talk will be issued to reemphasize key points in the use of the EE580 system including:

1. EE580 data base must be verified against the installation and inspection records when *C is indicated in the data base and against outstanding DCPs prior to use.
2. The work control groups are responsible to return EE580 cards to the EE580 Coordinator when the Work Order is closed.
3. The EE580 Coordinator is responsible to update the data base when the completed EE580 cards are returned.
4. Any question concerning EE580 must be referred to the EE580 Coordinator or identified individual within Nuclear Engineering who have completed extensive EE580 training until such time as additional training has been completed.

CONCLUSION

A review of the investigation results has determined that the Design Change Packages contain sufficient information to verify technical adequacy of design and that appropriate design reviews were completed. Additionally, it was determined that the Palo Verde electrical configuration has been controlled and can be determined through the EE580 program and associated as-built/installation records. The investigation also determined that administrative deficiencies have occurred in the processing of electrical design changes and supplemental training in the EE580 program is required. Action is being taken to correct these weaknesses.

