ATTN
for

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

(7)

JUL 15 1982

Docket No. 50-329 (82-07)
Docket No. 50-330

Consumers Power Company
ATTN: Mr. James W. Cook
Vice President
Midland Project
1945 West Parnall Road
Jackson, MI 49201

Gentlemen:

This refers to the routine safety inspection conducted by Mr. I. T. Yin of this office on April 21-23, 1982, of activities at the Midland Nuclear Plant, Units 1 and 2, authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82 and to the discussion of our findings with Mr. W. R. Bird and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

We are concerned regarding the significant number of pipe supports which were found to have deficiencies as identified during your reinspections of some of the piping suspension systems which had previously been inspected during 1980. As a result, it is our view that you should reinspect all the supports and restraints installed and inspected in 1980, and perform sample reinspections of the components installed and inspected in 1981 and 1982. You are requested to submit to this office a schedule for the reinspection program within twenty-five (25) days from the date you receive this letter. We will, however, consider any alternative proposals that you may want to include in your response letter.

82-07
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Midland /DETP

No items of noncompliance were identified during the course of this inspection. We initially considered whether the findings of your reinspection program to this point should have been reported to the NRC under the provision of 10 CFR 50.55(e). Our preliminary conclusion, based on the utility's evaluation, is that had these findings remained uncorrected, they could not have adversely affected the safety of operations and that the intent of this part of the Regulation was satisfied. We will review this matter, including the timeliness of your evaluation, during a future inspection. Irrespective of our finding, the results of your extended reinspection programs should continue to be evaluated to determine reportability under the Regulation.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractors) believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within ten (10) days from the date of this letter of your intention to file a request for withholding; and (b) submit within twenty-five (25) days from the date of this letter a written application to this office to withhold such information. If your receipt of this letter has been delayed such that less than seven (7) days are available for your review, please notify this office promptly so that a new due date may be established. Consistent with Section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons which are the bases for the claim that the information should be withheld from public disclosure. This section further requires the statement to address with specificity the considerations listed in 10 CFR 2.790(b)(4). The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, a copy of this letter and the enclosed inspection report will be placed in the Public Document Room.

The responses directed by this letter 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.

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-329/82-07(DETP); 50-330/82-07(DETP)

Docket Nos. 50-329; 50-330 Licenses No. CPPR-81; CPPR-82

Licensee: Consumers Power Company
1945 West Parnall Road
Jackson, MI 49201

Facility Name: Midland Plant, Units 1 and 2

Inspection At: Midland Site, Midland, MI

Inspection Conducted: April 21-23, 1982

Inspector: I. T. Yin 5/24/82

Approved By: D. H. Danielson, Chief 5/28/82
for Materials and Processes Section

Inspection Summary

Inspection on April 21-23, 1982 (Reports No. 50-329/82-07(DETP); 50-330/82-07(DETP))
Areas Inspected: Followup on licensee corrective actions in response to Region III inspection findings; review of field change procedures used at the site for small bore piping and pipe supports. This inspection effort involved a total of 18 inspector-hours onsite by one NRC inspector.
Results: No items of noncompliance or deviations were identified.

DETAILS

Persons Contacted

CPCo

*R. E. Whitaker, Section Head - Mechanical and Fluids, MPQAD
*W. R. Bird, Manager, MPQAD
*J. A. Mooney, Executive Manager
*R. M. Wheeler, Section Head - Technical Section, Construction
*L. R. Howell, Supervisor - Mechanical and Fluids
*M. J. Schaeffer, Section Head - Electrical/I&C
*M. L. Curland, Site QA Superintendent - MPQAD
*H. P. Leonard, Section Head, HVAC, MPQAD
D. B. Miller, Site Manager

Bechtel

*M. A. Dietrich, PQAE, MPQAD
*W. R. Smith, LPM
*R. K. Siple, Lead QC Services
*P. Grogren, APFE
*A. Kiliszek, ALME
*D. S. Riat, Resident Assistant Project Engineer
*M. A. Verderosa, Supervisor - MQAE
R. Marl, Lead MFE
P. Corcoran, Resident Project Engineer
D. Berlaza, Resident QE
E. Smith, PFQCE
A. McClure, QAE Supervisor
R. Hollar, PQE

*Denotes those who attended the management exit interview on April 23, 1982.

Licensee Action on Previous Identifed Items

(Closed) Unresolved Item (329/81-12-10; 330/81-12-11): Additional clarification should be made relative to the QC acceptance criteria on pipe restraint gap measurements. The inspector reviewed the matter including the licensee documentation, and considered the matter closed. See Paragraph 2 for inspection details.

(Open) Violation (329/81-12-11; 330/81-12-12): The piping suspension system components were not installed in accordance with design drawings and specifications. The licensee overinspection identified additional problems. See Paragraph 1 for inspection details.

(Open) Violation (329/81-12-12; 330/81-12-13): The QC inspectors failed to identify nonconforming installation conditions. The licensee overinspection identified additional problems. See Paragraph 1 for inspection details.

(Closed) Violation (329/81-12-13; 330/81-12-14): Small bore piping and supports had been installed without the required Committed Preliminary Design Calculations (CPDCs). In conjunction with the Region III inspection findings discussed in Region III Report No. 50-329/81-14; 50-330/81-14, the inspector reviewed the Bechtel Stress Calculation Status Report, dated August 6, 1981. The report provided cross reference of isometric drawings and the calculations performed for the systems. A total of 1379 backlogged isometric drawings were re-evaluated and approved on August 6, 1981. The inspector also reviewed a Bechtel, Ann Arbor memorandum, from the Midland Project Engineer to various Department Heads, dated June 1, 1981, "Lessons Learned from Recent NRC Region III Inspection," and considered the Bechtel preventive measures to be adequate. Licensee audits performed since the Region III Immediate Action Letter, dated May 22, 1981, identified no significant design problems. This item is considered to be resolved.

(Closed) Violation (329/81-12-14; 330/81-12-15): Document Control deficiencies were identified during a Region III inspection of the site small bore piping design group. The problem was resolved based on: (1) Region III followup inspections in July 1981, (2) close-out of issues regarding the lack of required CPDCs, and (3) the licensee and Bechtel audits performed in the fourth quarter of 1981, and the first quarter of 1982 that identified no recurring document control problems at the site small bore design work locations.

(Closed) Unresolved Item (329/81-12-15; 330/81-12-16): Inadequate control of installation changes. Further review of the item was performed. This item is now considered to be closed. See Paragraph 3 for inspection details.

(Closed) Violation (329/81-12-16; 330/81-12-17): Inadequate licensee QA design audits performed in the area of field design of small bore pipe systems. The inspector reviewed Bechtel, Ann Arbor QA design audit schedules for the fourth quarter of 1981, and the first and second quarters of 1982, and the corresponding CPCo Audit Reports No. M01-216-1, performed on November 10-13, 1981, and No. M01-217-1, performed on February 8 through March 4, 1982, and had no adverse comment. The inspector also reviewed the site audit schedule for the Resident Engineer's field small bore piping design activities for the fourth quarter of 1981, and the first and second quarters of 1982, and the corresponding CPCo Audit Reports, No. M01-215-1, performed on October 26-30, 1982, and No. M01-309-1, performed on February 2-9, 1982, and had no adverse comment.

(Closed) Violation (329/81-14-01; 330/81-14-01): Inadequate design control involving the RE review of the FE redline drawings issued for small bore piping and piping support design and installation. Relative to the specific issues, i.e., (1) there was a lack of established procedure for handling the review and approval of FE redline drawings from March 1979 to November 1980, and (2) some of the redline hanger drawings were without confirmed design loadings supported by piping system stress CPDCs, the Bechtel Small Pipe Group at site completed 100% review for all the questionable systems, that had been identified to be without CPDCs in the past. Relative to the issue, that there was a lack of RE measures to control major or minor FE design changes, the inspector reviewed the revised Bechtel EDPI-4.46.9, "Project

Engineering Review of Field Marked-Up Work Prints (Redlines) for Midland Project 7220," Revision 3, dated November 2, 1981, and had no adverse comment.

(Closed) Open Item (329/81-14; 330/81-14, Paragraph 2): Positions and general comments noted by the Region III management. The six items discussed during the meetings held at the site on July 23-24, 1981, were reviewed by the inspector. The one item relative to a comment that the licensee should initiate an investigation to identify whether or not there are similar design control problems existing in other site activities was reviewed further, see Paragraph 4 of this report. The other items involving CPDCs for site designed small bore piping systems and licensee control of field issued redline drawings were resolved during this inspection.

Functional or Program Areas Inspected

1. Piping Suspension System Installation/QC Inspection Program Breakdown

These safety related support and restraint installation and QC inspection deficiencies were identified during the NRC-Region III team inspection conducted in May 1981. The findings are described in Region III violation items 329/81-12-11; 330/81-12-12; 329/81-12-12; and 330/81-12-13. In response to the Region III findings, the licensee conducted an investigation and reported to Region III in a letter, dated October 30, 1981, stating that the deficiencies identified by the NRC inspector were all QC inspected in the time period of May to December 1980. The letter also stated that, "An evaluation conducted by MPQAD of quality indicators related to hangers for the time period June 1980 to May 1981, found that half of the indicators were issued between September 17 and November 19, 1980, which coincides with the QC inspection dates for the hangers identified by Mr. Yin. The evaluation also found that during that time period, the number of crafts personnel significantly increased. Construction had not assured that hangers were complete and met the requirements of the most recent drawing revision prior to turnover to QC. The result was that QC received a large number of hangers to inspect and these hangers had a relatively large number of deficiencies."

An overinspection was conducted by the licensee to determine the seriousness of the situation. From a sample size of 123 safety-related supports and restraints installed and QC inspected in CY 1980, the following deficiencies were identified, some of which were denied to be deficiencies by Bechtel engineers and QC subsequent to their evaluations.

No. of Hangers Rejected by CPCo Overinspection	No. of Hangers Concurred by Bechtel to be a Rejectable Item
12 (Note 1)	10 (Note 6)
14 (Note 2)	14 (Note 6)
17 (Note 3)	14 (Note 6)
10 (Note 4)	9 (Note 6)
7 (Note 5)	6 (Note 6)
60 Total	53 Total

Note 1: CPCo NR M-01-9-2-007, dated February 4, 1982
Note 2: CPCo NR M-01-9-2-010, dated February 5, 1982
Note 3: CPCo NR M-01-5-2-014, dated February 3, 1982
Note 4: CPCo NR M-01-5-2-015, dated February 5, 1982
Note 5: CPCo NR M-01-5-2-017, dated February 5, 1982

In view of the large percentage of rejectable hangers that were not identified by Bechtel QC in CY 1980, i.e., 48.8% per CPCo NRs, or 43.1% per Bechtel response, the inspector determined that there appeared to be a breakdown in the licensee piping suspension system installation/QC inspection program in CY 1980. In discussion with the licensee QA engineers, the hanger overinspection items were divided in characteristics. There were 9401 characteristics in the 123 supports and restraints. The deficiencies identified amounted to 127. Percent rejectable rate was 1.4 based on characteristical determination. The inspector stated that this type of statistical analysis could be used to demonstrate the sophistication of installation/inspection involved, but was meaningless in terms of determination of QC program effectiveness. The reasons are: (1) the characteristics are determined subjectively; (2) overstress of a support can occur at any weak link even though other parts are sufficiently strong; (3) present construction/QC inspection programs are per hanger basis.

The record review concluded that the number of supports installed and QC inspected were as follows:

1649 in CY 1980
3270 in CY 1981
approximately 780 in CY 1982 as of to date.

In discussion with the licensee management personnel, the inspector noted that there should be a 100% re-inspection of all the hangers installed in 1980, and sample re-inspection of hangers installed in CY 1981 and 1982. Additionally, any licensee alternative proposals will be reviewed and concurred in by Region III.

The inspector reviewed the CPCo identified 127 deficiencies subsequent to the inspection. The following is a summary approximation of the inspectors review. Oversized structural members were not included in the study.

Nonconformances	Percentage
Configurations and Locations	32
Defective Welds, Undersized Welds, and Welding not in accordance with design	28
Restraint Gaps	16
Design and Red-line Drawing	10

Wrong Material, Undersize Material 9

Loosening, Missing Parts, Wrong Component Parts 5

The results of this review further strengthened the inspector's conclusion, that a major re-evaluation of the licensee's program of CY 1980 is necessary. In discussion with CPCo management, the inspector was told that significant improvements have taken place in CY 1981 and CY 1982.

2. QC Acceptance Criteria on Pipe Restraint Gap Measurements

The inspector reviewed the Bechtel Quality Action Request (QAR) No. F-106A, dated September 25, 1981, relative to clarification of the subject matter questioned in Region III Inspection Report No. 50-329/81-12 and No. 50-330/81-12. The inspector reviewed the Bechtel QAR project design engineering department responses, and considered the Bechtel position to be acceptable. During discussions with CPCo site staff, the following materials were presented to the inspector. The inspector stated that the licensee presentation had helped in resolving concerns.

The specification utilized for the inspection/acceptance of installed hangers is 7220-M-326(Q) "Technical Specification for Installation, Inspection, and Documentation of ASME Section III Pipe Supports, Hangers, and Restraints for Piping in A Nuclear Power Plant for Consumers Power Company Midland Plant, Units 1 and 2" - Section 5.0 Installation and, more specifically, Section 5.1.3 which deals with allowable tolerances for clearances between the pipe pr pipe lug and its supporting structures.

The subject hanger (18-1HCB-2-H13) was inspected/accepted to the requirements of this specification.

The specification identified in Region III Items 329/81-12-10; 330/81-12-11 relative to 7220-M-366(q) entitled, "Technical Specification for Field Fabrication of ASME Section III Pipe Supports, Hangers, and Restraints for 2-1/2 inch and Larger Piping in a Nuclear Power Plant for Consumers Power Company Midland Plant, Units 1 and 2" is utilized for field fabrication only.

The reference to Specification 7220-M-325(Q) is considered by MPQAD to be a typographical error intending to be stated as Specification 7220-M-326(Q), since specification 7220-M-325(Q) is entiteld, "Exhibit D Technical Specifications for Subcontract for Main Condenser Erection for CPCo."

3. Licensee Control of Piping Installation Rework

During an inspection conducted in May 1981, the licensee's control relative to the removal of installed and QC accepted small bore piping systems, including supports and restraints, was not apparent. The details of the subject matters were discussed in Section V, Paragraph 3.c.

of Region III Inspection Report No. 50-329/81-12; 50-330/81-12. As a part of the inspection followup, the inspector reviewed the following licensee documents:

- Administrative Guidelines M-1.00 For the Rework of Large Pipe, Pipe Supports, and Mechanical Equipment, Revision 2, dated October 16, 1981.

- Administrative Guidelines M-2.00 For the Rework of Small Pipe and Pipe Supports, Revision 2, no date.

Subsequent to the review, the inspector stated that the materials contained in these Administrative Guidelines adequately addressed the intent of the four issues raised and discussed in the Region III inspection report mentioned above. During the review, the inspector raised the question why the Administrative Guidelines had not been properly issued and controlled in accordance with the Bechtel QA program. The Bechtel QA/QC management responded that the Guidelines are provided for the Field Engineers to better understand the use of the various established work procedures. The inspector reviewed rework records of the Fuel Pooling Cooling Discharge (1" line sections), and the Service Water to Chiller System (4" line sections) to ensure procedural adequacy and implementation prior to the issuance of these Guidelines. Review areas included: (1) FE redline drawings that were incorporated in the as-built drawings, (2) weld rework and inspection records, (3) witness of heat number transfer prior to material separation, and (4) red line procedure provisions. No items of noncompliance or deviations were identified as a result of the review.

4. Bechtel Internal Design Audit

Subsequent to the design deficiencies that were identified by the Region III team inspection conducted in May 1981, and during meetings held at the site on July 21-24, 1981, with the CPCo and Bechtel staff the Region III management commented that the licensee should initiate an investigation to identify whether or not there are similar problems existing in other site activities. The Bechtel audits relative to the Ann Arbor office design control were as follows:

- On June 6, 1981, the Midland Project Engineer (MPE) issued instruction for the Midland design staff to review records to ensure that all system design drawings were backed by CPDCs.

- On June 16, 1981, the MPE instructed the Midland Project Quality Engineer (MPQE) to initiate audit and surveillance efforts in mechanical and civil/structural design activities.

- On August 7, 1981, MPQE developed an overview program on design control.

- Surveillances were conducted in January 1982, for civil/structural departments, and corrective action on deficiencies were completed on February 12, 1982.

- Surveillances were conducted in March 1982, for mechanical departments. A majority of the deficiencies were resolved prior to April 22, 1982. Final closeout was scheduled by April 29, 1982.

- As of the date of inspection, no design change was identified or initiated.

The inspector stated that the Bechtel design review program appeared to be adequate. However, he would like to conduct an independent review at Bechtel, Ann Arbor design engineering office to ensure program adequacy and effective implementation. This was considered to be an unresolved item (329/82-07-01; 330/82-07-01).

Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. The unresolved item disclosed during the inspection is discussed in Paragraph 4.

Exit Interview

The inspector met with licensee representatives prior to the conclusion of the inspection. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the findings reported herein.

III. THERMAL ANALYSIS POTENTIAL CONCERNS

As stated in the previous section, the potential concern is for the possible need for derating of some cables because of thermal effects. Trays that are wrapped (either for fire protection according to 10CFR, Appendix R, or for channel separation according to Regulatory Guide 1.75) and trays that exceed 30% fill by volume (FSAR Table 8.3-44) require thermal analysis. Thirty percent tray fill is considered to be a conservative level for initiating analysis and is the most widely accepted value in the industry.

According to FSAR Appendix 9A, a 20-foot horizontal separation is required between redundant safe shutdown cables. According to Regulatory Guide 1.75, a 3-foot horizontal and a 5-foot vertical separation are required. Raceway (cable tray) is wrapped when the configuration cannot meet these separation requirements.

In reviewing raceway drawings, a subject raceway is picked and reviewed in every direction to determine if another Category 1E raceway of a different channel is within the space allowed. The process is repeated throughout the length of the raceway. When two sections of raceway are found to be less than the required distance apart, both raceways will be analyzed for thermal effects, and the tray with the lower energy level (wattage per square foot) will be identified for wrapping (in Drawing Series E-2500 and E-2600).

To acquire an additional level of confidence, the number of power cables that have the potential for being misinstalled in a pull will be determined. This information will be used to identify other cable tray sections which may be analyzed considering the potential for misinstallation. This analysis will identify tray sections that require verification because of potential thermal derating of cable.

The thermal analysis is based on the cables designed to be in a given tray (in accordance with Raceway Schedule 7220-E-36). Therefore, when a tray is to be wrapped, it must be verified that the cables that are designed to be in that tray are present. Verification will be accomplished by inspecting identified tray sections to confirm that the population of cables in specific tray sections is the same quantity and size as established by Drawing 7220-E-36.

When a raceway is determined by verification to have a population different from that specified in Drawing 7220-E-36, additional inspections will be performed to identify the specifics of the population variance.

The specifics will be referred to Engineering for evaluation and resolution.

The above verifications and resolutions, if any, will provide a high level of confidence that cable misinstallations of the nature identified by the cable overinspection will not invalidate the required thermal analysis.

IV. ACTION PLANS

Actions accomplished or to be accomplished by various entities of the Midland Project are provided in this section. Upon completion of the actions identified in this section, the potential concerns, relative to possible cable misinstallations identified in Section II, will have been addressed.

The examples of cable misinstallations were reviewed with QC inspectors at the jobsite in a training session held March 15, 1982. The training session was conducted to familiarize the QC inspectors with the results of the overinspection.

Revision 5 to Project Quality Control Instruction (PQCI) 7220-E-3.0 was completed and submitted to MPQAD for review and approval May 6, 1982. This revision now includes instructions for inspection of separation distances and voltage separation. Subsequent to approval of the PQCI, QC inspectors will be trained to its requirements.

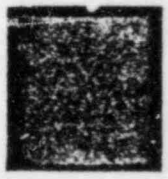
To address the concerns with thermal analysis, the actions described below are planned. Each specific action identified will be entered into the QA action item tracking system. In this system, actions are identified by number, are adequately described, and are assigned to a project team member (eg, the Project Engineer). Also, a member of MPQAD is assigned responsibility for the follow-up, evaluation and verification of completed actions for each action item.

Action Item Number	Action Required	Assigned To	Completion Date
TBD*	Establish criteria for raceway verification to eliminate thermal concerns resulting from potential cable misinstallation.	Project Engineering	TBD
TBD	Prepare inspection plans to implement raceway verification.	QC	TBD
TBD	Approve inspection plans for raceway verification.	MPQAD	TBD
TBD	Train and certify people to perform the verification.	QC	TBD
TBD	Complete the verification of raceway for misinstalled cable in accordance with the established inspection plans.	QC	TBD

Items determined not to conform to the design requirements will be documented on nonconformance reports. Each nonconformance report is tracked and will be closed as part of the QA program.

*TBD = to be determined

2. The majority of the few misinstalled cables expected in the total population will not impact safety adversely because the generic nature of these cases has been analyzed as described in this report and found to be inconsequential regardless of type and location.



V. CONCLUSION

In summary, the electrical cable overinspection by MPQAD identified several instances of incorrectly installed cable. Project Engineering has evaluated the generic implication of these cases on the rest of the installed Class 1E cables and has determined that any potential cable misinstallations would be identified and resolved or would be of minor consequence, as described in Section II.

Approximately 15% of the Class 1E cables have been overinspected and all 55 identified nonconformances were evaluated by Project Engineering and determined to have no adverse impact on safety. The nonconformances detected were minor discrepancies from design documents (usually one incorrect via on a cable routing). The majority of any other cable misinstallation nonconformances would be similarly resolved.

To further improve cable installation and to provide increased confidence, additional verification processes, as stated in Sections III and IV, will be initiated.

The Project conclusions are as follows:

1. The few misinstallations similar to the type identified in this report which could impact safety adversely will be detected by special inspections as described herein and will be dispositioned by Project Engineering accordingly.

TO: Distribution

FROM: MJSchaeffer, MPQAD

DATE: March 24, 1982

SUBJECT: [redacted]
File 10.0

Enclosed is the revised report on the results of the Special Electrical Overinspection requested by the NRC to support their testimony as to the adequacy of the certification/qualification process of Bechtel Electrical Quality Control Inspectors.

This report was revised to reflect that a total of 55 cables were misrouted, in lieu of 61, which was originally reported on the now superseded report dated February 25, 1982.

Distribution: WRBird, P14-418A
JWCook, P26-336B
RCook, NRC Inspector on Site
PCorcoran, Bechtel-Midland
MLCurland, Midland
LHCurtis, Bechtel-Ann Arbor
LEDavis, Bechtel-Midland
MADietrich, Bechtel-Midland
RGardner, NRC Region III
BWMarguglio, Midland
DBMiller, Midland
JARutgers, Bechtel-Ann Arbor
ESmith, Bechtel-Midland

RESULTS OF THE SPECIAL ELECTRICAL OVERINSPECTION REQUESTED BY NRC

I. Introduction

A. NRC requested that MPQAD perform special overinspections of the inspections made by 4 Bechtel Electrical Quality Control Engineers whose certifications were questioned by NRC because of the amount of training which was documented in their certification files.

B. NRC requested also that MPQAD perform special overinspections of the inspections made by any other Bechtel Electrical Quality Control Engineers whose original inspections were impacted by any then existing Nonconformance Reports originated by MPQAD. This resulted in the identification of 5 additional Bechtel Electrical Quality Control Engineers whose inspections were to be subject to the MPQAD special overinspection.

C. In a telephone conversation with Mr William Little of the NRC, it was agreed that 250 of these overinspections could be accomplished by Bechtel Electrical Quality Control Engineers, other than the 9 Engineers whose work was subject to this special overinspection.

D. MPQAD performed overinspections of 1,118 original inspections for cable pulls, cable terminations and cable tray supports. Each of these original inspections was documented on a Bechtel Quality Control Inspection Report (QCIR).

E. Bechtel Quality Control overinspected 250 cable pulls which were originally inspected by one Engineer. Each of these original inspections also was documented on a QCIR.

F. Therefore, 1,368 original inspections were overinspected by either MPQAD or Bechtel Quality Control.

II. Cable Pulls

A. For each cable pull, 24 characteristics were overinspected by either MPQAD or Bechtel Quality Control. These characteristics are enumerated in Table 1 (attached).

B. MPQAD overinspected 834 cable pulls and Bechtel Quality Control overinspected 250 cable pulls, for a total of 1,084.

C. Therefore, a total of 26,016 cable pull characteristics were overinspected (24 x 1,084).

D. There were 91 nonconforming via characteristics and 66 nonconforming recordings of cable reel numbers, for a total of 157 nonconforming characteristics. Therefore, 0.60 percent (157 ÷ 26,016) of the cable pull characteristics were nonconforming.

E. There were 55 misrouted individual cables in 1 or more vias, resulting in 5.07 percent (55 ÷ 1,084) of the cables being misrouted at 1 or more points.

III. Cable Terminations

A. For each cable termination, 12 characteristics were overinspected, as enumerated in Table 2 (attached).

B. MPQAD overinspected 282 cable terminations.

C. Therefore, a total of 3,384 characteristics (12 x 282) were overinspected.

D. There were 2 nonconforming characteristics, or 0.06 percent (2 ÷ 3,384).

E. Each of the termination nonconformances was on a different cable. Therefore, 0.71 percent (2 ÷ 282) of the terminations was nonconforming with regard to 1 characteristic.

IV. Cable Tray Supports

For each of the 2 cable tray support overinspections, there are 8 inspection characteristics, resulting in the overinspection of 16 characteristics. There were no nonconformances.

V. Totals

For all jobs overinspected, there were 159 individual nonconforming characteristics, from a total of 29,416 individual characteristics. Therefore, 0.54 percent (159 ÷ 29,416) of the characteristics were nonconforming.

VI. Disposition

A. Of the 157 individual nonconforming characteristics, 145 were dispositioned by Bechtel Project Engineering to be "used as is." The basis for this disposition for the cable routing nonconformances is that they have no impact on separation, segregation, physical loading and thermal loading and, therefore, no impact, whatsoever, on plant safety. The disposition of these cable routing nonconformances also calls for the drawings to be changed to reflect the "as built" conditions.

B. Twelve characteristics were dispositioned to be "reworked." Ten of these were for cable pulls involving ten different cables. The other two were for cable terminations. In each of these cases, Bechtel Project Engineering stated that there was no public safety impact, ie, that these nonconformances could not have caused an accident or impeded the ability to ameliorate the consequences of an accident. As a matter of fact, in the opinion of Bechtel Project Engineering, it was doubtful that any of these nonconformances would have impaired the functionability of the circuits involved. Attachment A provides the specifics of the Bechtel Project Engineering disposition and the jurisdiction for that disposition.

VII. Conclusions

On the basis of the above information, the undersigned believe that the Bechtel certification process for the nine Bechtel Quality Control Engineers was adequate. In the interest of further improvement, on-the-job training is now being documented and MPQAD, on a sampling basis, is overviewing the Bechtel Quality Control Engineer certification process. However, in each case for which the ANSI N45.2.6-1973 education and experience criteria are not met, MPQAD is now overviewing the Bechtel certifications.

M J Schaeffer, Section Head
Electrical/I&C, MPQAD

3/26/82
Date

E L Jones, Group Supervisor
Electrical/I&C, MPQAD

3/26/82
Date

BWM/da

TABLE 1 - CHARACTERISTICS ASSOCIATED WITH CABLE PULL

Type of Characteristic	Number of Each Type of Characteristic
Cable jacket color band	1
Cable jacket color stripe	1
Cable identification tagging at each end	2
Cable reel number	1
Minimum cable bend radius[a]	1[a]
Cable vias[b]	15[b]
Cable ties[a]	1[a]
Cable tray damage	1
Cable damage	1
TOTAL	24

[a] There are multiple points at which the cables are bent or at which the cables are tied but, in the interest of conservation, these are each counted as one characteristic.

[b] For each cable pull, it is estimated that there is an average of 15 vias. This is considered to be a conservative estimate, although it was not arrived at by an actual count of the vias for each of the jobs overinspected.

TABLE 2 - CABLE TERMINATION CHARACTERISTICS

Type of Characteristic	Number of Each Type of Characteristic
Cable scheme number identification	1
Cable type identification	1
Cable code identification	
Cable reel number	1
Cable minimum bend radius	1
Cable permanent identification tag	1
Lug integrity	1
Termination integrity	1
Crimp integrity	1
Correct termination per wiring diagram	1
Shield and drain wires	1
Insulation	1
TOTAL	12

Consumers Power Company

NONCONFORMANCE REPORT

PROJECTS, ENGINEERING AND CONSTRUCTION - QUALITY ASSURANCE DEPARTMENT

6. PROJECT NAME:	7. NONCONFORMING PART NO:	8. NONCONFORMING PART NAME:	1. NCR SERIAL NO: M-01-9-9-059
Midland 1 & 2	See Attached List	Class 1E and non-Class 1E Conduits	2. DATE: 5-25-79
3. SERIAL NUMBER: NA	10. ORG. CONNECTING NC: Design/Proj Engr	11. AREA/LOC. OF NC: Aux Bldg and Cont Bldg #2	3. DATE OF REV: Closed 8-6-79
			4. FILE NO: 16.3.4

12. AS IS" NONCONFORMING CONDITION VERSUS AS QUALIFIED" CONDITION WHERE REPR:

Paragraph 4.6 of 1EEE Standard 279-1971 states, "Channels that provide signals for the same protective function shall be independent and physically separated to accomplish decoupling of the effects of unsafe environmental factors, electric transients, and physical accident consequences documented in the design basis, and to reduce the likelihood of interactions between channels during maintenance operations or in the event of channel malfunction".

(Contd on Page 3)

5. DISTRIBUTION

ACTION COPY:

LADreisbach

INFO COPY:

WLBarclay	DBMiller
WRBird	WGMoring
TCCooke	JFNewgen
JLCorley	RASimanek
RHermeston	DATaggart
SHHowell	RLCastleberry
DRJohnson	ERumbaugh
GSKeeley	
BWMarguglio	
PAMartinez	
JMilandin	

13. DA RECOMMENDATION FOR PART DA:

Use separate supports for redundant Class 1E conduits.

DESIGN/PROJECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ]

14. HOLD TAGS APPLIED: YES [ ] NO [X] TAGGED, LOCATION & TYPE OF HOLD TAGS APPLIED: NA

15. IS PROCESS DA REQUIRED: YES [X] NO [ ] IF NO, ENTER JUSTIFICATION BELOW:

16. DOES NC AFFECT A-E/CP? ITEM: YES [X] NO [ ]	17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]
18. IS NC REPORTABLE PER PART 21. YES [ ] NO [X]	19. IF YES, DATE & TIME OF REPORT TO NRC: NA
20. IF YES, WAS REPORT TO NRC: NA	21. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: NA

22. NCR GENERATED BY:	23. WRITTEN REPLY REQUIRED BY: 6-8-79 TO ESTABLISH DA COMPLETION DATE	24. SUPERVISOR'S SIGNATURE/DATE: 5-26-79

25. PART DA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

See Bechtel letter LAD-989 dated 7-2-79.

26. DESIGN/PROJECT ENG. ACTIV. DESP.:	27. PAD ENG. ACTIV. DESP.:	28. PROCUREMENT ENG. ACTIV. DESP.:	29. ENG. OF ENG. REQ. FOR D/A:
See Letter LAD-989 Dated 7-2-79	NA	NA	See Letter LAD-989 Dated 7-2-79
30. FAB/CONST. ENG. ACTIV. DESP.: See Letter LAD-989 Dated 7-2-79	31. ENG. OF TEST PROG ACTIVITY. DESCRIPTION: NA	32. FOR VALVE ENG - FLD. ENGR. ENG. ACTIV. DESP.: NA	33. DA ACTIV. ENG. TO DOCUMENT DESP.: See Letter LAD-989 Dated 7-2-79

34. METHOD OF PART DA VALIDATION:

See Bechtel letter LAD-989 dated 7-2-79.

35. ENG. OF ENG. DESP. FOR PART D/A SATISFACTORY COMPLETION:	36. ENG. VERIFYING PART D/A & HOLD TAG REMOVAL DATE:	37. NCR CLOSED BY (NAME): DATE PROCESS DA COMPLETE:
See Letter LAD-989 dated 7-2-79	8/6/79	8/6/79

CC Document Control (1141 - ~~37100~~ - ~~30000~~ - ~~73*01*07~~)

NCR SERIAL NO: M-01-9-9-059
DATE: 5-25-79
DATE OF REV: Closed 8-6-79
FILE NO: 16.3.4

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

(Contd from Page 1)

Contrary to the above, the following conduits are located on the same supports as indicated.

Conduit No		Inspection Status
1BTD002		Partial Inspection
1BTD003		Partial Inspection
1NJA017		NA
1NC108	On Same Support	NA
2AC091		No Inspection
2AC092		No Inspection
2EC024		IR Not Open
2EC021	On Same Support	IR Not Open
?AC101		No IR
2BC069	On Same Support	IR Not Open
2EC009		Partial Inspection
2AC115		Partial Inspection
2AC100		No IR
2AC101	On Same Support	No IR
1AC099		No Inspection
1BC064	On Same Support	No Inspection
1BC065		No Inspection
1N1P004	On Same Support	NA
1AC085		Partial Inspection
1EC038	On Same Support	Partial Inspection
1AJD025		IR Not Open
1NC218	On Same Support	NA
2AVA010		Partial Inspection
2BVA014		No Inspection
2AC075	On Same Support	Partial Inspection

The above condition was mentioned by an NRC inspector as a possible violation of 10CFR50 Appendix A.

Bechtel Power Corporation

Post Office Box 2167
Midland, Michigan 48640

July 2, 1979

JLC	C
DRK	
RCH	
XERK	R
QE	
FILE	

Consumers Power Company
P. O. Box 1963
Midland, MI 48640

Attention: J. L. Corley

Job 7220 Midland Project
CPCo NCR #M-01-9-9-059
Complete Response
LAD-989 Action Item-798

Dear Mr. Corley:

Reference: IOM dated June 25, 1979, R. L. Castleberry to L. A. Dreisbach

The subject NCR concerns conduits of redundant channels being located on the same supports. Per paragraph 4.6 of IEEE Standard 279-1971 "Channels that provide signals for the same protective function shall be independent and physically separated to accomplish decoupling of the effects of unsafe environmental factors, electric transients and physical accident consequences documented in the design basis, and to reduce the likelihood of interactions between channels during maintenance operations or in the event of channel malfunction".

In response Project Engineering has evaluated the subject concerns and determined that the use of separate supports for redundant class IE conduit is not required. Refer to referenced IOM (attached) for justification.

This is considered to be a complete response to the subject NCR. If further assistance and/or clarification is necessary please contact the writer.

Very truly yours,

L. A. Dreisbach
Project Quality Assurance
Engineer

CONSUMERS POWER COMPANY
RECEIVED
JUL 3 1979
FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

LAD/RCH/bsm

Attachment

cc: W. Bird
B. Marguglio

Bechtel Associates Professional Corporation

Inter-office Memorandum

Job 7220-QA-Received 6/26/79			
Log No. 1660 File No.			
Response Req'd NO Date			
QA Action Item No. 793			
Route	Info	Act	Comment
PQAE	✓		
Resp. Cor.	✓	X	
Elect (1)		X	
Elect (2)			
Civil/Mech			
Piping/Weld			
Inst.			
Trn Ovr			
Trend			
Proj.		X	

FYI: Discuss with NCR.

To L.A. Dreisbach

Date June 25, 1979

Subject Midland Plant Units 1 & 2
Job 7220
NCR M-01-9-9-059
QPRR 798

From R.L. Castleberry

Of Engineering

At Ann Arbor

Copies to File: 0274, 0545.1

W. Moring
W. Terrell
R. Baltazar
Com Log

This is a complete response to NCR M-01-9-9-059 and QPRR 798.

The use of separate supports for redundant Class 1E conduits is not required. Routing of Class 1E conduits is designed to provide the physical separations necessary to meet the criteria for a particular location. The need for channels to be in close proximity is usually due to equipment location or physical space constraints. The routing of these conduits is examined for environmental factors and physical accident consequences such as missiles, jet impingement, pipe whip and/or a seismic event. Pipe restraints and barriers for protection from missiles and jet impingement will be installed when any of these hazards exist. The remaining factor is the design base seismic event for which the support is designed.

From a seismic standpoint all structural features of the plant are coupled. When an earthquake motion disturbs the soil upon which the building rests, the entire building including all equipment, piping, duct, raceway and associated supports respond to the input motion. Whether two conduits are supported by the same support, separate supports attached to the same beam or separate supports attached to separate inserts in the same concrete surface, a coupling factor still exists. Having the two conduits attached to the seismically designed support would prevent the conduits from damaging each other by any seismically induced motion. Likewise, for the seismic class two over one case a properly designed seismic support would provide protection to safety related circuit and conduit from the non-safety related conduit.

Seismic Category 1 structures will not fail for a design base earthquake. The support for Class 1E conduit is a seismic Category 1 designed structural member.

for R.L. Castleberry

PP/jt
6/20/2

QUALITY ACTION REQUEST

cc: WRBird MJuister JAMooney
JEBrunner GSKeeley JARutgers MJSchaeffer
JWCook BWMarguglio TKSubramanian
MLCurland REMcCue RAWells
MADietrich DBMiller ALAB(2)

Priority: 01 SUS: NTS000 Trend: G-9 AI: S-1634 File: 16.0

(1) From:
M J Schaeffer, MPQAD

(2) To:
L H Curtis, Proj Engineering

(3) Control Document ref.:
1EEE Std 279-1971

(4) QAR Ident. No.:
F-192

(5) Action Requested:
In May of 1979, NCR M01-9-9-059 was generated to address a concern of an NRC Inspector. This NCR covered two redundant conduits on the same support. On 7/30/82, CPCo was given an Unresolved Item, by the NRC, concerning the following conduits mounted on the same support: 2AG127; 2EG089; and 2DG029. It is requested that Project Engineering provide Enginnering rational to support multiple safety channel conduits on the same support in apparent conflict with Paragraph 4.6 of 1EEE Std 279-1971.

(6) Signature: M J Schaeffer

(7) Date: 8/2/82

(8) Reply Requested by:
8/16/82

(9) Reply:

(10) Signature:

(11) Date:

(12) Action Verified:

(13) Date:

8/2/74

Attachment 2 to
Report on Cable Installation

Consumers Power Company

NONCONFORMANCE REPORT

P. ECTS, ENGINEERING AND CONSTRUCTION - QUALITY ASSURANCE DEPARTMENT

QA27-0 SUS: OGLH Trend: B-3, (B-5) (I-3) (I-5) Priority: 5 AI: S-1270 PAGE 1 OF 2

6. PROJECT NAME:	7. NONCONFORMING PART NO:	8. NONCONFORMING PART NAME:	1. NCR SERIAL NO: MCI-9-2-013
Midland 1 and 2	OAB 4511 H	Electrical Cables	2. DATE: 2/3/82 CLOSED 4/16/82
9. SERIAL NUMBER: N/A	10. ORG. CONCERNING NC: Bechtel Construction/ Bechtel Quality Control	11. AREA/LOC. OF NC: Lower Cable Spreading Room	3. DATE OF REV: N/A
			4. FILE NO: 16.0 KPH

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

Bechtel Electrical Circuit Schedule Drawing E-37, Revision 52, Run 107 gives the first five vias for routing cable scheme OAB 4511 H as: AWW024, AFB07, AFB08, AFB09 and AFA09. Bechtel PQCI 7220/E-4.0 gives identical routing requirements.

Contrary to the above requirements, actual cable routing of this cable for the first seven vias is AWW024, AFC06, AFC07, AFC08, AFC09, AFA10, AFA09

5. DISTRIBUTION

ACTION COPY:
LHCurtis
LEDavis
ESmith

INFO COPY:
WRBird JLWood
JWCook DANott
MADietrich ALAB-2
BWMarguglio MJSchaeffer
REMcCue ~~CFoldin~~ BHPeck
DBMiller RDJohnson
~~BHPeck~~ MLCurland
JARutgers
DATaggart
~~DMTurnbull~~
RAWells

13. QA RECOMMENDATION FOR PART CA:

Bechtel Engineering evaluate routing of cable OAB 4511 H. Take appropriate action to make E-37 and routing of cable agree. (LHCurtis)

DESIGN/PROJECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ]

14. HOLD REQUIRED: YES [ ] NO [X] NUMBER, LOCATION & TYPE OF HOLD TAGS APPLIED:

15. IF PROCESS CA REQUIRED: YES [X] NO [ ] IF NO, ENTER JUSTIFICATION BELOW:

16. DOES NC AFFECT Q-LIST ITEM: YES [X] NO [ ]	17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]
18. IS NC REPORTABLE PER PART 21: YES [ ] NO [X]	19. IF YES, DATE & TIME OF REPORT TO NRC: N/A
20. IF YES, WHO MADE REPORT TO NRC: N/A	21. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: N/A

22. NCR ORIGINATED BY:	23. WRITTEN REPLY REQUIRED BY. 2/24/82 TO ESTABLISH CA COMPLETION DATE	24. SUPERVISOR'S SIGNATURE/DATE:
D.A. Nott 2/3/82		M 9. Schuster 2/3/82

25. PART CA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

LHCurtis response dated 2/23/82 attached.

26. DESIGN/PROJECT SIG. AUTH. DISP.:	27. PMO SIG. AUTH. DISP.:	28. PROCUREMENT SIG. CONC. DISP.:	29. SIG. OF ORG. RESP. FOR C/A:
See Block 25	N/A	N/A	See Block 25
30. FIELD CONST. SIG. AUTH. DISP.: See Block 25	31. SIG. OF TEST GROUP ACKNOW. CONDITION: N/A	32. FOR MAJOR MOD - PLT. SUPT. SIG. AUTH. DISP.: N/A	33. QA AUTH. SIG. TO IMPLEMENT DISP.:

34. METHOD OF PART CA VERIFICATION:

Verified DCN-884 and latest Revision of Drawing E-37 reflect the as pulled vias of Cable OAB4511H.

35. SIG. OF ORG. RESP. FOR PART C/A VERIFYING COMPLETION:	36. SIG. VERIFYING PART C/A & HOLD TAG REMOVAL/DATE: / /	37. NCR CLOSED BY/DATE:

Attachment 2 to
Report on Cable Installation

To: B. W. Marguglio

Consumers Power Company

NONCONFORMANCE REPORT

From: L. H. Curtis

SUS: OGLH Trend: B-3, (B-5) Priority: 5 AI: S-1270 PAGE 1 OF 2

5. PROJECT NAME:	7. NONCONFORMING PART NO:	8. NONCONFORMING PART NAME:	1. NCR SERIAL NO: MCI-9-2-013
Midland 1 and 2	OAB 4511 H	Electrical Cables	2. DATE: 2/3/82
SERIAL NUMBER: N/A	10. ORG. COMMITTING NC: Bechtel Construction/ Bechtel Quality Control	11. AREA/LOC. OF NC: Lower Cable Spreading Room	3. DATE OF REV: N/A
			4. FILE NO: 16.0

"AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

Bechtel Electrical Circuit Schedule Drawing E-37, Revision 52, Run 107 gives the first five vias for routing cable scheme OAB 4511 H as: AWW024, AFB07, AFB08, AFB09 and AFA09. Bechtel PQCI 7220/E-4.0 gives identical routing requirements.

Contrary to the above requirements, actual cable routing of this cable for the first seven vias is AWW024, AFC06, AFC07, AFC08, AFC09, AFA10, AFA09

5. DISTRIBUTION

ACTION COPY:

LHCurtis
LEDavis
ESmith

INFO COPY:

WRBird JLWood
JWCook DANott
MADietrich ALAB-2
BWMarguglio
REMcCue/CFollin
DBMiller
BHPeck
JARutgers
DATaggart
DMTurnbull
RAWells

QA RECOMMENDATION FOR PART CA:

Bechtel Engineering evaluate routing of cable OAB 4511 H. Take appropriate action to make E-37 and routing of cable agree. (LHCurtis)

DESIGN/PROJECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ]

HOLD TAGS APPLIED: YES [ ] NO [X] NUMBER, LOCATION & TYPE OF HOLD TAGS APPLIED:

IS PROCESS CA REQUIRED: YES [X] NO [ ] IF NO, ENTER JUSTIFICATION BELOW:

DOES NC AFFECT Q-LIST ITEM: YES [X] NO [ ]	17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]
IS NC REPORTABLE PER PART 21: YES [ ] NO [X]	19. IF YES, DATE & TIME OF REPORT TO NRC: N/A
IF YES, WHO MADE REPORT TO NRC: N/A	21. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: N/A

NCR CONSOLIDATED BY:	23. WRITTEN REPLY REQUIRED BY: 2/24/82 TO ESTABLISH CA COMPLETION DATE	24. SUPERVISOR'S SIGNATURE/DATE:
D.A. Nott 2/3/82		M. J. Schuster 2/3/82

PART CA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

This is Project Engineering's complete response. The actual 'as built' routing for cable OAB4511H has been evaluated and is acceptable as is. DCN number 884 to E-37 has been issued (2/12/82) to reflect the 'as built' route.

cc: D. Borlaza P. Corcoran
D. Hollar G. Warner
L. Curtis

ACTION PRINT	DAN
INFO PRINTS	
MPQA ROUTING	DMT
PRINT TO FILE	
ORIG TO FILE	16.0

25. DESIGN/PROJECT SIG. AUTH. DISP.: P. Corcoran for R. Curtis 2/12/82	27. PMO SIG. AUTH. DISP.: N/A	28. PROCUREMENT SIG. COMC. DISP.: N/A	29. SIG. OF ORG. RESP. FOR C/A: P. Corcoran for L. Curtis 2/12/82
26. FAB/CONST. SIG. AUTH. DEP. DISP.:	31. SIG. OF TEST GROUP ACKNOW. CONDITION: N/A	32. FOR MAJOR MOD - PLT. SUPT. SIG. AUTH. DISP.: N/A	33. QA AUTH. SIG. TO IMPLEMENT

METHOD OF PART CA VERIFICATION:

SIG. OF ORG. RESP. FOR PART C/A STIPULATING VERIFICATION:	36. SIG. VERIFYING PART C/A & HOLD TAG REMOVAL/DATE:	37. NCR CLOSED BY/DATE: (PART & PROCESS CA COMPLETE)

Consumers Power Company

NONCONFORMANCE REPORT
PROCESS CORRECTIVE ACTION

PROJECTS, ENGINEERING AND CONSTRUCTION - QUALITY ASSURANCE DEPARTMENT

NCR SERIAL NUMBER: M01-9-2-013

8. ASSESSMENT OF ROOT CAUSE(S):

Bechtel Construction did not follow correct routing for cable scheme OAB 4511 H. QC Engineer did not verify correct routing of the cable.

9. ACTUAL ROOT CAUSE(S), IF DIFFERENT FROM ABOVE (TO BE COMPLETED BY ORG. RESPONSIBLE FOR PROCESS CA):

10. PROCESS CA RESULTED FROM:

DESIGN [ ] FABRICATION [ ] CONSTRUCTION [X] PROCUREMENT [ ] INSPECTION [X]

OTHER

11. QA RECOMMENDATION FOR PROCESS CA:

(1) Determine if there were other cables in this pull which may not be routed other than as specified by E-37. Inform MPQAD of results. (LEDavis)

(2) Review PQCI E-4.0, "Installation of Electrical Cables" with cable pulling QCEs, emphasis to be placed on Activity 2.5. Inform MPQAD when action is complete. (ESmith)

12. PROCESS CA TO BE TAKEN BY ORG(S) CHECKED IN BLOCK #1 & DATE OF COMPLETION:

13. METHOD OF PROCESS CA VERIFICATION:

14. SIG. OF ORG. RESPONSIBLE FOR PROCESS CA SIGNIFYING COMPLETION:

15. PROCESS CA COMPLETION VERIFIED BY/DATE:

Attachment 2 to Report on Cable Installation

JOB 7220 MIDLAND PROJECT

BECHTEL POWER CORP.

TRANSMITTAL FORM

Nº 20275

PLEASE RECEIPT AND RETURN BLUE COPY IMMEDIATELY

DATE 4/12/82

*** ACTION**

ACTION FOR VENDORS	ACTION FOR OTHERS
1. ☐ APPROVED - MFG. MAY PROCEED	6. ☐ FOR APPROVAL
2. ☐ APPROVED SUBMIT FINAL DWG. MFG. MAY PROCEED	7. ☐ CONSTRUCTION
3. ☐ APPROVED EXCEPT AS NOTED. MAKE CHANGES AND SUBMIT FINAL DWG. MFG MAY PROCEED AS APPROVED	8. ☐ PRELIMINARY USE
4. ☐ NOT APPROVED. CORRECT AND RESUBMIT	9. ☐ REFERENCE
5. ☐ REVIEW NOT REQUIRED MFG. MAY PROCEED.	10. ☒ Complete response

SUBJECT	CODE
☐ BECHTEL DRAWINGS	B
☐ VENDOR DRAWINGS	V
☐ MATERIAL REQUISITION	MR
☐ SPECIFICATIONS	S
☐ BID REQUEST	BR
☐ QUOTATIONS	Q
☐ PURCHASE ORDER	PO
☐ CONFERENCE NOTES	CN
☐ BID SUMMARY	BS
☐ SUBCONTRACTS	SC
☐ _____	X
☐ _____	Y

ATTENTION VENDORS: ALL FINAL DRAWINGS SUBMITTED TO BECHTEL MUST BE CERTIFIED TRANSPARENCIES.

QTY.	P. P. PREFIX / BECHTEL FOREIGN PR. NO. ☐ / BECHTEL DRAWING NO. ☐	REV. NO.	TITLE	VENDOR NO.	ACTION	CODE
			MPQAD NCR M-01-9-2-013			
			QA AI S-1270			
			QC AI 1503			

CONSUMERS POWER COMPANY
RECEIVED
APR 14 1982
FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

COMMENTS: cc: W. R. Bird
B. W. Marguglio

ACTION PRINT	DAN
INFO PRINTS	
MPQA ROUTING	MLC
FILE TO FILE	
DRIG TO FILE	16.0

THIS COPY FOR

TO

D. M. Turnbull, MPQAD
Consumers Power Company

FROM

ESmith, Quality Control
Bechtel Power Corp.

☐ VENDOR PRINT
☐ OTHER

BY D.S.T. E. Smith

BBS FORM 16751

ORIGINAL

QC AI 1503

MPQAD NCR M-01-9-2-013
QA AI S-1270

A review of PQCI E-4.0 Rev. 9, "Installation of Electrical Cables" with cable pulling QCE's was performed on 3/12/82. Special emphasis was placed on activity 2.5, verification of correct vias.

T/N 20275

JOB 7220 MIDLAND PROJECT

Attachment 2 to Report on Cable Installation

BECHTEL POWER CORP.

TRANSMITTAL FORM

Nº 22997

PLEASE RECEIPT AND RETURN BLUE COPY IMMEDIATELY

DATE February 17, 19[illegible]

*** ACTION**

ACTION FOR VENDORS	ACTION FOR OTHERS
1. ☐ APPROVED - MFG. MAY PROCEED	6. ☐ FOR APPROVAL
2. ☐ APPROVED SUBMIT FINAL DWG. MFG. MAY PROCEED	7. ☐ CONSTRUCTION
3. ☐ APPROVED EXCEPT AS NOTED. MAKE CHANGES AND SUBMIT FINAL DWG. MFG MAY PROCEED AS APPROVED	8. ☐ PRELIMINARY USE
4. ☐ NOT APPROVED. CORRECT AND RESUBMIT	9. ☐ REFERENCE
5. ☐ REVIEW NOT REQUIRED MFG. MAY PROCEED	10. ☒ complete response

SUBJECT	CODE
☐ BECHTEL DRAWINGS	B
☐ VENDOR DRAWINGS	V
☐ MATERIAL REQUISITION	MR
☐ SPECIFICATIONS	S
☐ BID REQUEST	BR
☐ QUOTATIONS	Q
☐ PURCHASE ORDER	PO
☐ CONFERENCE NOTES	CN
☐ BID SUMMARY	BS
☐ SUBCONTRACTS	SC
☐ _____	X
☐ _____	Y

ATTENTION VENDORS: ALL FINAL DRAWINGS SUBMITTED TO BECHTEL MUST BE CERTIFIED TRANSPARENCIES.

QTY.	P. P. PREFIX / BECHTEL FOREIGN PR. NO. ☐ / BECHTEL DRAWING NO. ☐	REV. NO.	TITLE	VENDOR NO.	* ACTION	CODE
			NCR M-01-9-2-013 A.I. S-1270			

[illegible] COMPANY

RECEIVED

FEB 18 1982

FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

ACTION PRINT	DAN
INFO PRINTS	BWM/ELJ/MTS
MTRA ROUTING	DAT
PRINT TO FILE	
ORIG TO FILE	16.0

COMMENTS: _____

THIS COPY FOR

TO
B.W. Marguglio
Jackson - CPCo
c.c. W.R. Bird
D.M. Turnbull

FROM
L.E. Davis
Midland Jobsite

☐ VENDOR PRINT
☐ OTHER

BY [signature] _____

9BS FORM 16791

ORIGINAL

NCR M-01-9-2-013 A.I. S-1270

A complete review of all cables in the A-276 pull package revealed 1AA-0503M and 1AA-504L were also incorrectly routed. The actual routing was determined to be acceptable. FCN 6388 has been written to correct E-37 to the "as built" condition.

To: B. W. Marguglio

Consumers Power Company

NONCONFORMANCE REPORT

From: L. H. Curtis

Priority: 1 Start Up: CD-88 Trend: I-3, (I-5) AI: S-1273 PAGE 1 OF 5

6. PROJECT NAME:	7. NONCONFORMING PART NO:	8. NONCONFORMING PART NAME:	1. NCR SERIAL NO: M-01-9-2-016
Midland 1 & 2	See below	Electrical Cables	2. DATE: 2/11/82
4. SERIAL NUMBER: N/A	10. ORG. CONCEIVING NC: Bechtel Construction/ QC/Project Engineering	11. AREA/LOC. OF NC: Various Class 1E Locations	3. DATE OF REV: N/A
			4. FILE NO: 16.0

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

) MPQAD overinspections have determined that the actual routing of the listed cables does not conform to the required routing.

The "AS IS" condition of cable routing and the "AS REQUIRED" cable routing, taken from Electrical Circuit Schedule E-37, Rev 52, are listed adjacent to the cable scheme numbers and routing inconsistencies underlined.

) The "AS IS" condition of cable routing does not also conform to the "AS REQUIRED" routing referenced in Bechtel PQCI 7220/E-4.0, which was used by Bechtel for inspection and acceptance of cables.

) The cable routing given by E-37, Rev 52, is identical to that referenced by PQCI/E-4.0 for each of the listed cables.

5. DISTRIBUTION

ACTION COPY:
LHCurtis/PCorcoran
LEDavis
ESmith

INFO COPY:
WRBird DMTurnbull
JWCook RAWells
MLCurland JLWood
MADietrich ALAB-2
RDJohnson MJSchaeffer
BWMarguglio
REMcCabe
DBMiller
BHPeck
JARutgers
DATaggart

13. RECOMMENDATION FOR PART CA:

) Bechtel Engineering is requested to evaluate the impact of the "AS IS" cable routing to determine acceptability and advise Bechtel Construction accordingly.(LHCurtis)

(Continued on page 5)

DESIGN/PROJECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ]

HOLD TAGS APPLICABLE: YES [ ] NO [X] NUMBER, LOCATION & TYPE OF HOLD TAGS APPLIED:

IS PROCESS CA REQUIRED: YES [X] NO [ ] IF NO, ENTER JUSTIFICATION BELOW:

DOES NC AFFECT Q-LIST ITEM: YES [X] NO [ ]		17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]	
IS NC REPORTABLE PER PART 21: YES [ ] NO [X]		19. IF YES; DATE & TIME OF REPORT TO NRC: N/A	
IF YES, WHO MADE REPORT TO NRC: N/A		21. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: N/A	
22. CA COORDINATED BY: M J Schaeffer	23. WRITTEN REPLY REQUIRED BY: 2/15/82 TO ESTABLISH CA COMPLETION DATE	24. SUPERVISOR'S SIGNATURE/DATE: M. J. Schaeffer 2/11/82	

PART CA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

See attached for Project Engineering's response.

ACTION PRINT	MJS
INFO PRINTS	
MPQA ROUTING	DMT
PRINT TO FILE	
ORIG TO FILE	16.0

cc: D. Borlaza
D. Hollar
L. Curtis
P. Corcoran
G. Warner
[redacted]

THIS COPY FOR

26. ES&PM/PROJECT SIG. AUTH. DISP.: S. J. P. Corcoran for L. Curtis 2/12/82	27. PMO SIG. AUTH. DISP.: N/A	28. PROCUREMENT SIG. CONC. DISP.: N/A	29. SIG. OF ORG. RESP. FOR C/A: P. Corcoran for L. Curtis 2/12
30. AE/CONST. SIG. AUTH. DEP. DISP.:	31. SIG. OF TEST GROUP ACKNOW. CONDITION: N/A	32. FOR MAJOR MOD - PLT. SUPT. SIG. AUTH. DISP.: N/A	33. QA AUTH. SIG. TO IMPLEMENT DISP.:

METHOD OF PART CA VERIFICATION:

Consumers Power Company

NONCONFORMANCE REPORT
PROCESS CORRECTIVE ACTION

PROJECTS, ENGINEERING AND CONSTRUCTION - QUALITY ASSURANCE DEPARTMENT

M-01-9-2-016

NCR SERIAL NUMBER: _____

6. ASSESSMENT OF ROOT CAUSE(S):

Bechtel Construction and QC in conjunction with Project Engineering to determine the root cause and inform MPQAD. (LEDavis & ESmith)

ACTUAL ROOT CAUSE(S), IF DIFFERENT FROM ABOVE (TO BE COMPLETED BY ORG. RESPONSIBLE FOR PROCESS CA):

PROCESS CA REQUIRED FROM:

DESIGN [ ] FABRICATION [ ] CONSTRUCTION [X] PROCUREMENT [ ] INSPECTION [X]

OTHER _____

8. RECOMMENDATION FOR PROCESS CA:

Determine the need for additional Process Corrective Action in view of the fact that QAD NCR M-01-9-2-013, dated 2/3/82, addressed a similar problem. Inform MPQAD of the decision and action taken to preclude reoccurrence of the cable routing discrepancies. (LEDavis & ESmith)

PROCESS CA TO BE TAKEN BY ORG(S) CHECKED IN BLOCK #1 & DATE OF COMPLETION:

METHOD OF PROCESS CA VERIFICATION:

9ID. OF ORG. RESPONSIBLE FOR PROCESS CA SIGNIFYING COMPLETION:

45. PROCESS CA COMPLETION VERIFIED BY/DATE:

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
OAB6501N	AS REQUIRED ROUTING: ASL135, AJB041, AJB02, AJB01, AJB025, AA027, AMH006, AA063, AJ1059, ASA027, ASA09, ASA08, ASA07, ASA06, ASA05, ASA04, ASA03, ASA014 and ASL968. AS IS ROUTING: ASL135, AJB041, AJB02, AJB01, AJB025, AA027, AMH006, AA063, AJ1059, ASA027, ASA08, ASA07, ASA06, ASA05, ASA04, ASA03, ASA014 and ASL968.
2AB6302K	AS REQUIRED ROUTING: AKA054, AKA04, AKA03, AKA02, AKF01, AJF02, AJF01, AFD01, AFD02, AFD03, AFD04, AFD05, AFD06, AFV07, AFV08, AFU99, AFA09, AFD09 and ASL921 (Per DCN 657). AS IS ROUTING: AKA054, AKA04, AKA03, AKA02, AKA01, AJF01, AFD01, AFD02, AFD03, AFD04, AFD05, AFD06, AFV07, AFV08, AFU99, AFA09, AFD09 and ASL921.
CAB6502M	AS REQUIRED ROUTING: ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, AJF02, AKF01, AKA02, AKA03, AKA04 and AKA054. AS IS ROUTING: ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, AKA01, AKA02, AKA03, AKA04 and AKA054.
OBY3614A	AS REQUIRED ROUTING: BSL936, BDB01, BDA02, BDA01, BJ419, BAO32, BJ524, BJA073, BJA05, BJA04, BJA03 and BJA035. AS IS ROUTING BSL938, BDB01, BDA02, BDA01, BJ419, BAO32, BJ524, BJA073, BJA05, BJA04, BJA03 and BJA035.

2. "AS IS" NONCONFORMING CONDITIONS VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
1AB5301K	AS REQUIRED ROUTING: ASL944, ADB01, ADA02, ADA01, AJ424, AA033, AFK01, AJL01, AFE01, AFF01, AFF02, AFB01, AFB02, AFB03, AFB04, AFB05, AFB06, AFB07, AFB08, AFB09, AFA09, AFA08, AFA07, AFA06, AFA05, AFA04, AFA03, AFA02, AFA01, AFL01, AFL03, AFL10, AJS07, ASL935. AS IS ROUTING: ASL945, ADB01, ADA02, ADA01, AJ424, AA033, AFK01, AJL01, AFE01, AFF01, AFF02, AFB01, AFB02, AFB03, AFB04, AFB05, AFB06, AFB07, AFB08, AFB09, AFA09, AFA08, AFA07, AFA06, AFA05, AFA04, AFA03, AFA02, AFA01, AFL01, AFL03, AFL10, AJS07 and ASL935.
1DQ157A	AS REQUIRED ROUTING: DTB005, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC003, DTA002, DTA21, DTA22. AS IS ROUTING: DTB005, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DFA08, DJA07, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DJA01, DC002, DTA003, DTA21, DTA22.
1DQ396D 1DQ396F 1DQ396H 1DQ396L 1DQ396T	AS REQUIRED ROUTING: DTB004, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA01, DC003, DTA002, DTA21, DTA22. AS IS ROUTING: DTB004, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DFA08, DJA07, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DJA01, DC002, DTA003, DTA21, DTA22.
1DQ177E	AS REQUIRED ROUTING: DSL907, DGA01, DWW001, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC003, DTA002, DTA21. AS IS ROUTING: Coil, DTB03, DFA08, DJA07, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DJA01, DC002, DTA003, DTA21.

13. QA RECOMMENDATION FOR PART CORRECTIVE ACTION: (Continued from page 1)

B)

1. Bechtel Construction is requested to comply with the E-37 Rev 52, or direction from Project Engineering per (A) above. (LEDavis)

2. Bechtel QC is requested to update the applicable QCIRs to reflect the nonconforming condition identified. (ESmith)

JR M-01-9-2-016
AI: S-1273
Attachment

This is Project Engineering's complete response:

CABLE SCHEME NUMBER	EVALUATION
0AB6501N 2AB6302K 0AB6502M 1AB5301K	'As built' routes as stated are acceptable. Use as is: E-37 revised, reference DCN number 884 (2/12/82).
0BY3614A	'As built' via BSL938 is stated incorrectly on NCR. 'As built' via (verified by Resident Engineering) is BSL937. This via is acceptable as is. E-37 revised, reference DCN number 884 (2/12/82).
1DQ157A 1DQ396D 1DQ396F 1DQ396H 1DQ396L 1DQ396T 1DQ177E	a) 'As built' vias...DFA08, DJAC7... are unacceptable. (Instrument cable installed in control raceway) Field Engineering has been directed to rework cables into vias as stated in E-37. b) 'As built' vias...DJA01, DC002, DTAC03...are stated incorrectly on NCR. 'As built' vias (verified by Resident Engineering) are DC002, DTAC03... These vias are acceptable as is. E-37 revised reference DCN number 884 (2/12/82).

Bechtel Associates Professional Corporation

777 East Eisenhower Parkway
Ann Arbor, Michigan

Mail Address: P.O. Box 1000, Ann Arbor, Michigan 48106

059360

BLC 12497

February 18, 1982

RECEIVED
FEB 19 1982
FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

Consumers Power Company
P. O. Box 1963
3500 E. Miller Road
Midland, Michigan 48640

Attention: B. W. Marguglio

Subject: Midland Plant Units 1 & 2
Consumers Power Company
Bechtel Job 7220
Additional Response to CPCo
NCR M-01-9-2-016 and Bechtel
NCR 3996 AI 3.1.3.3

References: A) CPCo NCR M-01-9-2-016 date February 17, 1982
B) Bechtel NCR 3996 dated February 17, 1982

As requested, the following is additional information to the response which we provided to the above-referenced NCRs.

Cables 1DQ157A, 1DQ396D, 1DQ396F, 1DQ396H, 1DQ396L, 1DQ396T, 1DQ177E, (NCR M-01-9-2-016) 1DQ403E, 1BQ403D, and 2BB5626A (NCR 3996) have been reviewed for control/power and instrument cables being routed together. Based on an induced voltage calculation for the power cable (2BB5626A), cable characteristics, and length of run, engineering has determined that if these cables were to have been left in the as-installed condition, they would not adversely affect the safety operation of the plant through its design life.

If you have any questions on the subject, please advise.

L. H. Curtis
Project Engineering Manager

LHC/PJC/GDW/sll

Written Response Required: No

cc: M. Schaffer
D. Turnbull
W. Bird
D. Taggart

ACTION PRINT	MTS
INFO PRINTS	
ROUTING	OMT
TO FILE	
ORIG TO FILE	16.0

THIS COPY FOR

Consumers Power Company

NONCONFORMANCE REPORT

To: R. W. Marguglio
From: L. H. Curtis

Priority: 1 SU: CD-88 Trend: I-3, (I-5) B-3 (B-5) AI: S-1289 PAGE 1 OF 5

4. PROJECT NAME:	7. NONCONFORMING PART NO:	8. NONCONFORMING PART NAME:	1. NCR SERIAL NO: M-01-9-2-021
Midland 1 & 2	See below	Electrical Cables	2. DATE: 2/16/82
5. SERIAL NUMBER: N/A	10. ORG. CONCERNED NC: Bechtel Construction/ QC/Project Engineering	11. AREA/LOC. OF NC: Various Class 1E Locations	3. DATE OF DET: N/A
			6. FILE NO: 16.0

12. "AS IS" NONCONFORMING CONDITION (VERSUS "AS STANDARD" CONDITION WITH REFS):

A) MPQAD overinspections have determined that the actual routing of the listed cables does not conform to the required routing.

The "AS IS" condition of cable routing and the "AS REQUIRED" cable routing, taken from Electrical Circuit Schedule E-37, Rev 52, are listed adjacent to the cable scheme numbers and routing inconsistencies underlined.

B) The "AS IS" condition of cable routing does not also conform to the "AS REQUIRED" routing referenced in Bechtel PQCI 7220/E-4.0, which was used by Bechtel for inspection and acceptance of cables.

C) The cable routing given by E-37, Rev 52, is identical to that referenced by PQCI/E-4.0 for each of the listed cables. (Cont'd)

13. QA RECOMMENDATION FOR PART CA:

A) Bechtel Engineering is requested to evaluate the impact of the "AS IS" cable routing to determine acceptability and advise Bechtel Construction accordingly. (LHCurtis)

DESIGN/PROJECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ] (Continued on page 5)

15. DISTRIBUTION
ACTION COPY:
LHCurtis/PCorcoran
LEDavis
ESmith
INFO COPY: DScott, DATaggart, WRBird, DMTurnbull, JWCook, RAWells, MLCurland, JLWood, MADietrich, ALAB-, RDJohnson, BWMarguglio, REMcCue, DBMiller, BHPeck, JARogers, MJS[illegible]

14. HOLD TAGS APPLIED: YES [ ] NO [X] REMOVAL, LOCATION & TYPE OF HOLD TAGS APPLIED:

RECEIVED
FEB 19 1982
FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

16. IS PROCESS CA REQUIRED: YES [X] NO [ ] IF NO, DEFER JUSTIFICATION BELOW:

16. DOES NC AFFECT Q-LIST ITEM: YES [X] NO [ ]	17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]
18. IS NC REPORTABLE PER PART 21: YES [ ] NO [X]	19. IF YES, DATE & TIME OF REPORT TO NRC: N/A
20. IF YES, WHO MADE REPORT TO NRC: N/A	21. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: N/A

22. NCR ORIGINATED BY: M J Schaeffer mjs	23. WRITTEN REPLY REQUIRED BY: 2/18/82 TO ESTABLISH CA COMPLETION DATE	24. SUPERVISOR'S SIGNATURE/DATE: Michael J Schaeffer 2/17/82

25. PART CA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

PROJECT ENGINEERING'S COMPLETE RESPONSE IS ATTACHED.

cc: D. Borlaza, R. Hollar, L. Curtis, D. Turnbull, P. Corcoran, G. Warner, J. Horsch, J. Kovach

THIS COPY FOR →

ACTION PRINT	MTS
INFO PRINTS	
MPQA ROUTING	DMT
PRINT TO FILE	
ORIG TO FILE	16.0

26. DESIGN/PROJECT SIG. AUTH. DISP.: 2/17/82 DLC MW SLC	27. PMO SIG. AUTH. DISP.: N/A	28. PROCUREMENT SIG. CONC. DISP.: N/A	29. SIG. OF ORG. RESP. FOR C/A: EH Chrisman for LH Curtis 2/17/82
30. PAB/CORRT. SIG. AUTH. DISP.:	31. SIG. OF TEST GROUP ACTION. CONCURRENCE: N/A	32. FOR VALVE NCR - FLT. SUPT. SIG. AUTH. DISP.: N/A	33. QA AUTH. SIG. TO DISPOSITION DISP.:

34. [illegible] OF PART CA VERIFICATION:

35. SIG. OF ORG. RESP. FOR PART C/A SIGNIFYING COMPLETION:	36. SIG. VERIFYING PART C/A & HOLD TAG REMOVAL/DATE:	37. NCR CLOSED BY/DATE: (PART A PROCESS CA COMPLETE)

Consumers Power Company

NONCONFORMANCE REPORT
PROCESS CORRECTIVE ACTION

PP&L CTS ENGINEERING AND CONSTRUCTION - QUALITY ASSURANCE DEPARTMENT

NCR SERIAL NUMBER: M-01-9-2-021

38. QA ASSESSMENT OF ROOT CAUSE(S):

Bechtel Construction and QC, in conjunction with Project Engineering, to determine the root cause and inform MPQAD. (LEDavis & ESmith)

39. ACTUAL ROOT CAUSE(S), IF DIFFERENT FROM ABOVE (TO BE COMPLETED BY ORG. RESPONSIBLE FOR PROCESS CA):

40. PROCESS CA REQUIRED FROM:

DESIGN [ ] FABRICATION [ ] CONSTRUCTION [X] PROCUREMENT [ ] INSPECTION [X]

OTHER _____

41. QA RECOMMENDATION FOR PROCESS CA:

Determine the need for additional Process Corrective Action in view of the fact that MPQAD NCR M-01-9-2-016, dated 2/11/82, addressed a similar problem. Inform MPQAD of the decision and action taken to preclude re-occurrence of the cable routing discrepancies. (LEDavis & ESmith)

42. PROCESS CA TO BE TAKEN BY ORG(S) CITED IN BLOCK 41 & DATE OF COMPLETION:

43. METHOD OF PROCESS CA VERIFICATION:

44. SIG. OF ORG. RESPONSIBLE FOR PROCESS CA SIGNIFYING COMPLETION:

45. PROCESS CA COMPLETION VERIFIED BY/DATE:

12. "AS IS"NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
	AS REQUIRED ROUTING:
1DQ 173 D 1DQ 173 E 1DQ 173 F 1DQ 177 D 1DQ 177 F 1DQ 181 B 1DQ 181 D 1DQ 181 F 1DQ 181 H	DSL907, DGA01, DWW001, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC003, DTA002, DTA21.
	AS IS ROUTING:
	Coil at DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC002, DTA003, DTA21.
	AS REQUIRED ROUTING:
OAB 6502 M 2AB 6302 K	ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, AJF02, AKF01, AKA02, AKA03, AKA04, AKA054.
	AS IS ROUTING:
	ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, *, AKA01, AKA02, AKA03, AKA04, AKA054.
	AS REQUIRED ROUTING:
2BI 003 A 2BI 004 A	BG042, BJ637, BG043, BG044, BG045, BJ1371, BG046, BA045, BVA005, BVA01, BVA98, BVA99.
	AS IS ROUTING:
	BG042, BJ637, BG043, BG044, BG045, BJ1371, BG046, BA045, BVA005, *, *, BVA99.
	AS REQUIRED ROUTING:
1AG 1113 E	ASL151, ADA005, ADA05, ADA04, ADA03, ADA02, ADA01, AJ424, AA033, AKF01, AJL003, AJL01, AFP01, AFP02, AFP03, AFN02, AFN01, AFL01, AFL03, AFL10, AJS07, AJS08, AJS09, ASL933.
	AS IS ROUTING:
	ASL151, ADA005, ADA05, ADA04, ADA03, ADA02, ADA01, AJ424, AA033, AKF01, AJL003, AJL01, AFP01, AFP02, AFP03, AFN02, AFN01, AFL01, AFL03, AFL10, AJS07, AJS08, AJS09, ASL935.

* Denotes that via was skipped

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
1BG 1213 B	AS REQUIRED ROUTING:
	BDA005, BDA05, BDA04, BDA03, BDA02, BDA01, BJ419, BA031, BJ524, BJA073, BJA05, BJN05, BJP01, BFH01, BFH02, BFH03, BFH04, BFH05, BFH06, BFH07, BFH08, BFH09, BFH10, BFH11, BFH12, BFH13, BFH14, BFA13, BFA14, BFA15, BFA002, BFF09.
	AS IS ROUTING:
	BDA005, BDA05, BDA04, BDA03, BDA02, BDA01, BJ419, BA031, BJ524, BJA073, BJA05, BJN05, BJP01, BJP02, BFH02, BFH03, BFH04, BFH05, BFH06, BFH07, BFH08 BFH09, BFH10, BFH11, BFH12, BFH13, BFH14, BFA13, BFA14, BFA15, BFA002, BFF09.
	AS REQUIRED ROUTING:
1BB 5610 C	BSL922, BJH01, BKA06, BKA05, BKE01, BJF03, BFB01, BFB02, BFB03, BFB04, BFB05, BFB015, BJ106.
	AS IS ROUTING:
	BSL922, *, *, BKA05, BKE01, BJF03, BFB01, BFB02, BFB03, BFB04, coiled.
	AS REQUIRED ROUTING:
1BA 0012 A	BFF09, BFA002, BFA15, BFA14, BFH14, BFH13, BFH12, BFH11 BFH10, BFH09, BFH08, BFH07, BFH06, BFH05, BFH04, BFH03, BFH02, BFH01, BJP01, BJN05, BJA05, BJA073, BJ524, BA031, BJ419, BDA01, BDA02, BDA03, BDA04, BDA05, BDA06, BDA07, BDA10.
	AS IS ROUTING:
	BFF09, BFA002, BFA15, BFA14, BFA13. BFH14, BFH13, BFH12, BFH11, BFH10, BFH09, BFH08, BFH07, BFH06, BFH05, BFH04, BFH03, BFH02, *, BJP01, BJN05, BJA05, BJA073, BJ524, BA031, BJ419, BDA01, BDA02, BDA03, BDA04, BDA05, BDA06, BDA07, BDA10.
	AS REQUIRED ROUTING:
1BI 067 A	BG083, BJ1763, BVA022, BVA16, BVA15, BVA14, BVA13, BVA12, BVA001, BVA06, BVA05, BVA04, BVA03, BVA02, BVA01 to 1Z132.
	AS IS ROUTING:
	BG083, BJ1763, BVA022, BVA16, BVA15, BVA14, BVA13, BVA12, BVA001, BVA06, BVA05, BVA04, BVA03, BVA02, BVA98 to incorrect end route 1Z133.

* Denotes that via was skipped

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	AS REQUIRED ROUTING	
	FROM	TO
2BA0001F	2C46	2J1145

BGF08, BWW023, BGC01, BGB02, BGB01, BTG01, BTB06, BTB011, BJ924, BA035, BJ690, BN054

AS IS ROUTING:

FROM	TO
2C46	2C232

BN054, BJ690, BA035, BJ924, BTB011, BTB06, BTG01, BGB01, BGB02, BGC01, BWW023, BGF08

13. QA RECOMMENDATION FOR PART CA:

B)

1. Bechtel Construction is requested to comply with the E-37 Rev 52, or direction from Project Engineering per (A) above. (LEDavis)

2. Bechtel QC is requested to update the applicable QCIRs to reflect the nonconforming condition identified. (ESmith)

NCR M-01-9-2-02
AI: S-1289
Attachment

This is Project Engineering's complete response.

Cable Scheme Number	Evaluation
1DQ173D 1DQ173E 1DQ173F 1DQ177D 1DQ177F 1DQ181B 1DQ181D 1DQ181F 1DQ181H 0AB6502M 2AB6302K 2BI003A 2BI004A 1AG113E 1BB5610C 1BA0012A	"As-built" routes as stated are acceptable. Use as is; E-37 has been revised; Reference DCN Number 885 dated February 17, 1982
1BG1213B	"As-built" via 1BJP02 is incorrectly stated on the NCR. The as-built route is ...BJP01, BFH02...; E-37 has been revised to reflect this route; Reference DCN Number 885 dated February 17, 1982
1BI067A	The scheme cable number is incorrectly stated on the NCR. The cable number should be 2BI067A. The as-built route for 2BI067A as stated is unacceptable. Field Engineering has been directed to rework the cable into the vias as stated in E-37.
2BA0001F	The "To Location" (2C232) as stated on the NCR is incorrect. The cable is pulled and terminated per the as required routing (2J1145). Therefore, a nonconforming condition does not exist for this cable.

5/4 # - See Block 16

NONCONFORMANCE REPORT

1. PROJECT NAME: MIDLAND UNITS 1 & 2	JOB NO.: 7220			19. NO. 3996	20. PAGE 1 OF 1
2. UNIT(S): 1 & 2	3. DRAWING/PART NO.: N/A	REV	4. ITEM DESCRIPTION: CABLES PULLED THROUGH UNSPECIFIED VIAS	5. ITEM LOCATION: VARIOUS	
6. P.O. OR SPEC NO.: N/A	7. SERIAL NO.: N/A	8. REPLACEMENT PART P/N ____ REV ____ SER NO. N/A	9. SOURCE: CONSTRUCTION	10. CONTRACTOR/SUPPLIER: N/A	
11. INSPECTION CRITERIA ( ) DWG ( ) SPEC ( ) OTHER IR NO. NO. FPE 4.040 REV. 5		12. ASME AUTHORIZED INSPECTION REQ'D ( ) YES (X) NO	13. SKETCH ATTACHED ( ) YES (X) NO	14. Discovered During ( ) Rec'g (X) Const ( ) Test	15. Equip Furnished By ( ) Client (X) Eng ( ) FLD

16. NONCONFORMING CONDITION: OVER-INSPECTION IN SUPPORT OF MPQAD, REVEALED THE FOLLOWING NON-CONFORMING ITEMS:

SEE CONTINUATION SHEETS FOR LIST OF NONCONFORMANCES.

17. REPORTED BY: Dale E. Peeler — DATE: 2-17-82

18. VALIDATED BY: D.S.P. — DATE: 2/17/82

21. ROUTING: (X) TO FIELD ENGINEERING ( ) TO OTHERS (SPECIFY)

22. (X) Field Engineering Disposition ITEM 17, 28, & 29 (X) Field Engineering Recommended Disposition to Project Engineering ITEM 1 thru 16, 18 thru 27

Field ENGINEERING recommended disposition TO PROJECT ENGINEERING for cables ON CONTINUATION sheet for block 16. Cable numbers follow: Cables 1 THROUGH 16, 18 THROUGH 27 inclusive. See CONTINUATION for block 22 for cables, 17, 28, & 29

23. PROJECT ENGINEERING DISPOSITION

ITEMS 1,2,3,4,5,7,8,10,11,12,13,14,15,16,20,21,22,23,24,25,26, & 27 HAVE BEEN RE-ROUTED PER DCN #885 to E37 to REFLECT AS INSTALLED CONDITION. USE AS IS

ITEMS 6 & 9 REFLECT AS BUILT CONDITION PER REV 52 OF E37-NO DWG. REVISION REQ'D. USE AS IS

ITEMS 18 & 19 HAVE BEEN DELETED PER DCN #885 to E37

J.G. Keppler for JGK 2/17/82 — D.F. Kirsch 2/17/82

24. DISPOSITION CONCURRENCE

rework	reject	repair	use as is
			X

PROJECT FIELD ENGINEER — DATE 2/19/82

PROJECT ENGINEER — DATE 3/8/82

D.S.P. — PROJ CONSTR QC ENGINEER — DATE 2/25/82

AUTHORIZED INSPECTOR — DATE

25. DISPOSITION RESULTS

26. QC ACCEPTANCE

QC ENGINEER — DATE

AUTHORIZED INSPECTOR — DATE

Attachment 2 to Report on Cable Installation

Block 16 (continued)

① Cable 2BB4405 B 2GTB
Requirements: Per E-37 Rev. 52, Vias ···· BJM01, BJB03 ····
Contrary to the above, cable installed in vias ···· BJM01, BJM02, BJB03 ····

② Cable 2BB4406 B 2GTC
Requirements: Per E-37 Rev. 52, Vias ···· BJM01, BJB03 ····
Contrary to the above, cable installed in vias ···· BJM01, BJM02, BJB03 ····

③ Cable 2BB4402 B 2GTB
Requirements: Per E-37 Rev. 52, Vias ··· BJM01, BJB03 ····
Contrary to the above, cable installed in vias ···· BJM01 BJM02, BJB03 ····

④ Cable 2BB4409 B 2GTE
Requirements: Per E-37 Rev. 52, Vias BSL952, BJK01, BJA04, BJM01, BJB03 ····
Contrary to the above, cable installed in vias BSL953, BJK01, BJA04, BJM01, BJM02, BJB03 ····

Attachment 2 to Report on Cable Installation

Block 16 (continued)

(5) Cable 1AB5514 B 1BNA
Requirements: Per E-37 Rev. 52, Vias ..... AJA05, AJC01 ... AZ077 ...
Contrary to the above, cable installed in vias .... AJA05, AJA06, AJC01 .... AZ076 ....

(6) CABLE 1AB5514 A 1BNA
REQUIRMENTS: PER E-37 REV. 52 VIAS AJL05, AJC01
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS AJL05, AJL06, AJC01

(7) CABLE ZBB4401 B 2658
(A) REQUIRMENTS: PER E-37 REV. 52 VIAS BJM01, BJB03
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS BJM01, BJM02, BJB03
(B) REQUIRMENTS: PER E-37 REV. 52 VIAS BSL951 ....
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS BSL952 ....

(8) Cable 1AB1704 B 1BKA
Requirements: Per E-37 Rev. 52 Vias .... AKC07, AKC041 ....
Contrary to the Above, cable installed in vias .... AKC07, AKC08, AKC041 ....

Attachment 2 to Report on Cable Installation

Block 16 (Continued)

(9) Cable 1AB1704 A 1BKA
Requirements: Per E-37 Rev. 52, Vias .... AKC07, AKC040 ....
Contrary to the above, cable installed in vias .... AKC07, AKC08, AKC040 ....

(10) Cable 1AB2327 A 1EAC
Requirements: Per E-37 Rev. 52, Vias ASL396, AJM05, AKA05 ....
Contrary to the above, cable installed in vias ASL396, AJM03, AKA05 ....

(11) Cable 2BB4401 E 2BSB
Requirements: Per E-37 Rev. 52, Vias ..... BJF01, BKA04, ...
Contrary to the above, cable installed in vias .... BJF01, BKA03, BKA04, ...

(12) CABLE 1AFW082 E 1ALA
REQUIREMENTS: PER E37 REV 52, VIAS ------AJB018, AJB14 ....
CONTRARY TO ABOVE, CABLE INSTALLE IN VIAS -----AJB018, AJT14, AJB14 --

(13) Cable 1AFW021 B 1ALA
Requirements: Per E-37 Rev. 52, Vias .... AJB018, AJB14 ....
Contrary to the above, cable installed in vias .... AJB018, AJT14, AJB14 ....

(14) Cable 1BB5638 A 1ABA
Requirements: Per E-37 Rev. 52, Vias BSL927, BJH06, BKA04 ....
Contrary to the above, cable installed in vias BSL927, BKA04 ....

Attachment 2 to Report on Cable Installation

Block 16 (continued)

(15) Cable 1BB2444 Q 1BGC
Requirements: Per E-37 Rev. 52, Vias BSL430, BKA06 ....
Contrary to the above, cable installed in vias BSL430, BJH11, BKA06 ....

(16) Cable 1BB5605 B 1ECB
Requirements: Per E-37 Rev. 52, Vias BSL921, BJH01, BKA06 ....
Contrary to the above, cable installed in vias BSL921, BKA06 ....

(17) Cable 2BB5626 A 2ALA
Requirements: Per E-37 Rev. 52, Vias BSL926, BKF03, BKA03, BKA04 BKA05, BKA06 ....
Contrary to the above, cable installed in vias BSL930, BKF01, BTB06, BJB06, BKA06 ....

(18) Cable 1BB5626 A 1ALA
Requirements: Per E-37 Rev. 52, Vias BSL926, BJH04, BKA05 ....
Contrary to the above, cable installed in vias BSL926, BKA05 ....

(19) Cable 1BB5626 B 1ALA
Requirements: Per E-37 Rev. 52, Vias BSL926, BJH04, BKA05 ....
Contrary to the above, cable installed in vias BSL926, BKA05 ....

(20) Cable 1BB5605 A 1ECB
Requirements: Per E-37 Rev. 52, Vias BSL921, BJH01, BKA06 ....
Contrary to the above, cable installed in vias BSL921, BKA06 ....

Block 16 (continued):

(21) Cable 1AB5526 A 1ALA
Requirements: Per E-37 Rev. 52, Vias ···· AKA05, AJC01 ····
Contrary to the above, cable installed in vias ···· AKA05, AKA06, AJA06, AJC01 ····

(22) Cable 1BB2441 B 1BGC
Requirements: Per E-37 Rev. 52, Vias ···· BJA20, BJE01 ····
Contrary to the above, cable installed in vias ···· BJA20, BJA21, BJE01 ····

(23) Cable 1AB2341 B 1BGC
Requirements: Per E-37 Rev. 52, Vias ASL399, AJM01, AJA06, AJC01 ····
Contrary to the above, cable installed in vias ASL399, AJM01, AJC01 ····

(24) Cable 1AB5512 B 1BGE
Requirements: Per E-37 Rev. 52, Vias ···· AJA05, AJC01 ····
Contrary to the above, cable installed in vias ···· AJA05, AJA06, AJC01 ····

(25) Cable 2AB5531 H 2PHK
Requirements: Per E-37 Rev. 52, Vias ··· AJH02, AKA05 ··· ASA03, ASB01, ASL973
Contrary to the above, cable installed in vias ··· AJH02, AKA06, AKA05 ···· ASA03, 1ASL968

(26) Cable OAB6909 A OEAA
Requirements: Per E-37 Rev. 52, Vias ···· ASA02, ASA03, ASA04 ····
Contrary to the above, cable installed in vias ··· ASA02, ASA04 ····

Attachment 2 to Report on Cable Installation

Block 16 (continued)

(27) Cable OAB6909B OEAA
Requirements: Per E-37 Rev. 52, Vias .... ASA02, ASA03, ASA04 ....
Contrary to the above, cable installed in vias .... ASA02, ASA04 ....

(28) Cable 1BQ403E 1SAB
Requirements: Per E-37 Rev. 52, Vias BSL170, BJA045, BJA01, BJA02, BJA03, BJA04, BJM01, BJF03 ....
Contrary to the above, cable installed in vias BSL170, BJA045, BTA01, BTA02, BTA03, BTA04, BJF03 ....

(29) Cable 1BQ403D 1SAB
Requirements: Per E-37 Rev. 52, Vias BSL169, BJA044, BJA02, BJA03, BJA04, BJM01, BJF03 ....
Contrary to the above, cable installed in vias BSL169, BJA044, BTA02, BTA03, BTA04, BJF03 ....

58 hold tags applied Q-list Nos 3.003
3.007

Block 22 (continued)
Cables 17, 28 & 29 will be reworked per E37 Rev 52 (T.C.) 2/17/82

Attachment 2 to Report on Cable Installation

POTENTIAL GENERIC CONCERNS TABLE

Cable	SK	Loc	Cable Will Be Covered By Analysis	QC Area Walkdown	Wrapping Criteria	Air Lining at MCCs	When All Field Work Is Done This Problem Will Be Corrected	Unique Case	No Concerns Total	Separation Appendix R	Separation RG 1.75	Thermal Analysis	Voltage Violation	Concerns Total	Remarks
			No Concern											**Potential Concern**	
1AB5514B	1	GA		X					X						
0AB6905A	2	SH	X						X						
0AB69[illegible]B	2	SH	X						X						
1BB2441B	3	GA			X				X						
2BB4401E	4	SG			X				X						
2AB5531A	5	SG			X	X			X						Both Ends of Cable (b)
1AB5301K	6	DG				X			X						
0BY3614A	7	DG				X			X						
1AG1113E	8	SE					X		X						
1BA0012A	9	SR			X				X						
1BB5605A	10	SG				X			X						
1BB5605B	10	SG				X			X						
1BB5626A	10	SG				X			X						
1BB5626B	10	SG				X			X						
1BB5638A	10	SG				X			X						
1AB2327A	11	SG										X		X	
2BB5626A	12	SG		X					X						Cable Was Reworked
1BB5610C	13	SG	X						X						
1AB1704B	14	SG			X				X						
1BB2444Q	15	SG						X	X						Tied to Last Rung Of Riser (a)
1AFW021B	16	GA					X		X						
1AFW082E	16	GA					X		X						
2BI067A	17	R						X		X					Cable Was Reworked
2BI004A	18	R		X					X						
2BI003A	18	R		X					X						
0AB6501N	19	SH	X						X						
1AB5526A	20	SG										X		X	
1AB5512B	20	SG										X		X	
2BB4401B	21	SG										X		X	
2BB4402B	21	SG										X		X	
2BB4406B	21	SG										X		X	
2BB4405B	21	SG										X		X	
2BB4409B	21	SG										X		X	
0AB6502M	22	SG										X		X	
2AB6302K	22	SG										X		X	
0AB4511H	23	SR										X		X	
1BQ403D	24	SG		X					X						Cable Was Reworked
1BQ403E	24	SG		X					X						Cable Was Reworked
1DQ157A	25	SR						X	X						
1DQ396D	25	SR						X	X						
1DQ396F	25	SR						X	X						
1DQ396H	25	SR						X	X						
1DQ396L	25	SR						X	X						
1DQ396T	25	SR						X	X						
1DQ177E	25	SR						X	X						
1DQ177D	25	SR						X	X						
1DQ177F	25	SR						X	X						
1DQ173D	25	SR						X	X						
1DQ173E	25	SR						X	X						
1DQ173F	25	SR						X	X						
1DQ181B	25	SR						X	X						
1DQ181D	25	SR						X	X						
1DQ181F	25	SR						X	X						
1DQ181H	25	SR						X	X						
1AB2341B	26	SG	X						X						
TOTAL			5	6	5	8	4	17	44(b)			11		11	

LEGEND

GA	General Auxiliary	SE	Safety Equipment
SH	Service Water	SR	Spreading Room
SG	1E Switchgear Room	R	Reactor
DG	Diesel Generator		

NOTES

(a) Unique

(b) Although the total of the "No Concerns" column is 44, the total of the bottom row is 45 because Sketch 5 has a dual condition

DEFINITIONS

A. NO CONCERNS

1. Cable Will Be Covered by Analysis

The actual cable installation did not utilize all the designed raceway vias; therefore, the absence of a cable would only make any of the thermal analysis required for tray wrapping and overfilled raceway more conservative.

2. QC Area Walkdown

During final area turnover QC shall verify, in accordance with PQCI 7220/E-3.0, that cables maintain the separation distances as shown in Drawing 7220-E-47, Paragraphs 5.1.3 and 5.1.4. Quality control shall also verify that all cable transitions maintain the proper voltage separation. This is accomplished by a visual inspection of the raceway identification number and a check against Drawing 7220-E-42A, Sheet 3. It should then be verified that the cable goes from one power raceway to another or from one instrument raceway to another.

3. Wrapping Criteria

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping of the affected tray. We wrap to the edge of the violation and then approximately 12 inches more for safety.

4. Airlining at MCCs

Cables may be run unsupported airlined for a maximum distance of 3 feet upon leaving the physical confines of scheduled raceway (Ref: E-42Q, Sh 5).

5. Airlining From the Same Tray Section - Terminations Not Affected

A cable can be airlined 3 feet without engineering approval. Also, a cable can be terminated from any stack of a motor control center.

6. When All Field Work Is Done This Problem Will Be Corrected

Cable Pulling - When a cable is completely pulled tight into all raceways, the problem with cables looping out from one tray to another will be corrected.

Terminations - When construction attempts to terminate a cable and discovers that the cable is not in the correct compartment of the panel, or the cable is not at the equipment to which the cable is to be terminated, field engineering is notified of the problem.

Cable Training - After all cable pulling is completed, cables are reworked so that they lay even in the tray. This will help eliminate cable humping (i.e., cables crisscross, causing the cables to overrun the sides of the tray).

7. Separation Appendix R

The design criteria is based on FSAR Appendix 9A.1.8.3 for achieving and maintaining safe shutdown after a fire (Ref: General Design Criterion 10 CFR, Appendix R).

8. Separation RG 1.75

The design criteria is based on FSAR Appendix 3A for achieving physical independence of electrical systems.

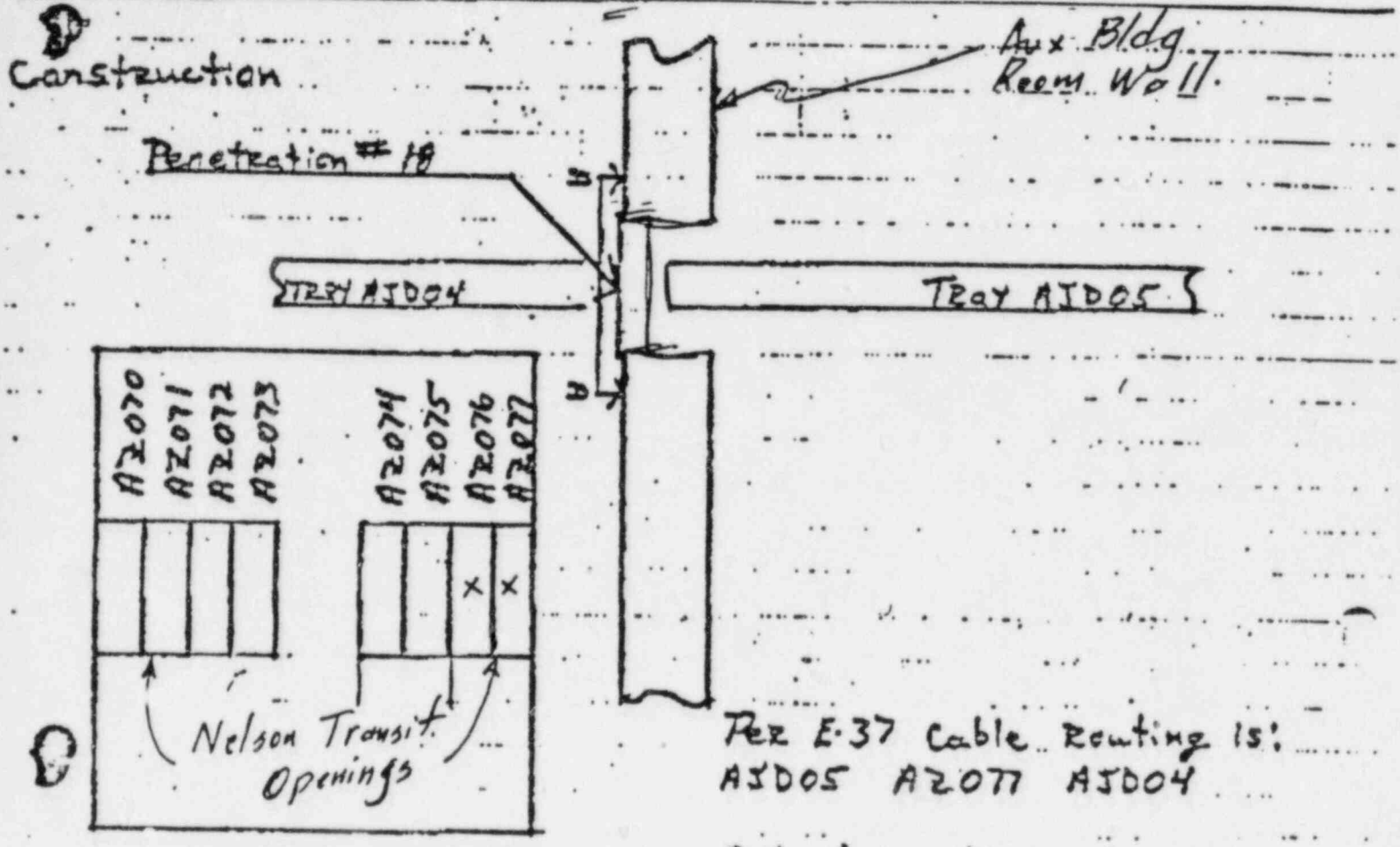
9. Thermal Analysis

When a tray is wrapped, heat generated from cables in that tray must be taken into consideration. If a cable is pulled into a tray that is being wrapped without engineering's knowledge, the thermal analysis will not include that cable.

10. Voltage Violation

Power and instrumentation cables are mixed.

CABLE # 1AB5514B SK # 1



Per E-37 Cable Routing is:
AJD05 A2077 AJD04

Actual routing is:
AJD05 A2076 AJD04

SK-1

Description of Basic Concern

This cable was passed through the wrong Nelson transit (cable seal) window. Both the right and wrong window were for power cables. However, because of the closeness of power and instrument penetrations in the plant, our basic concern was a possible voltage violation if this problem were repeated with a power cable being passed through an instrument cable window.

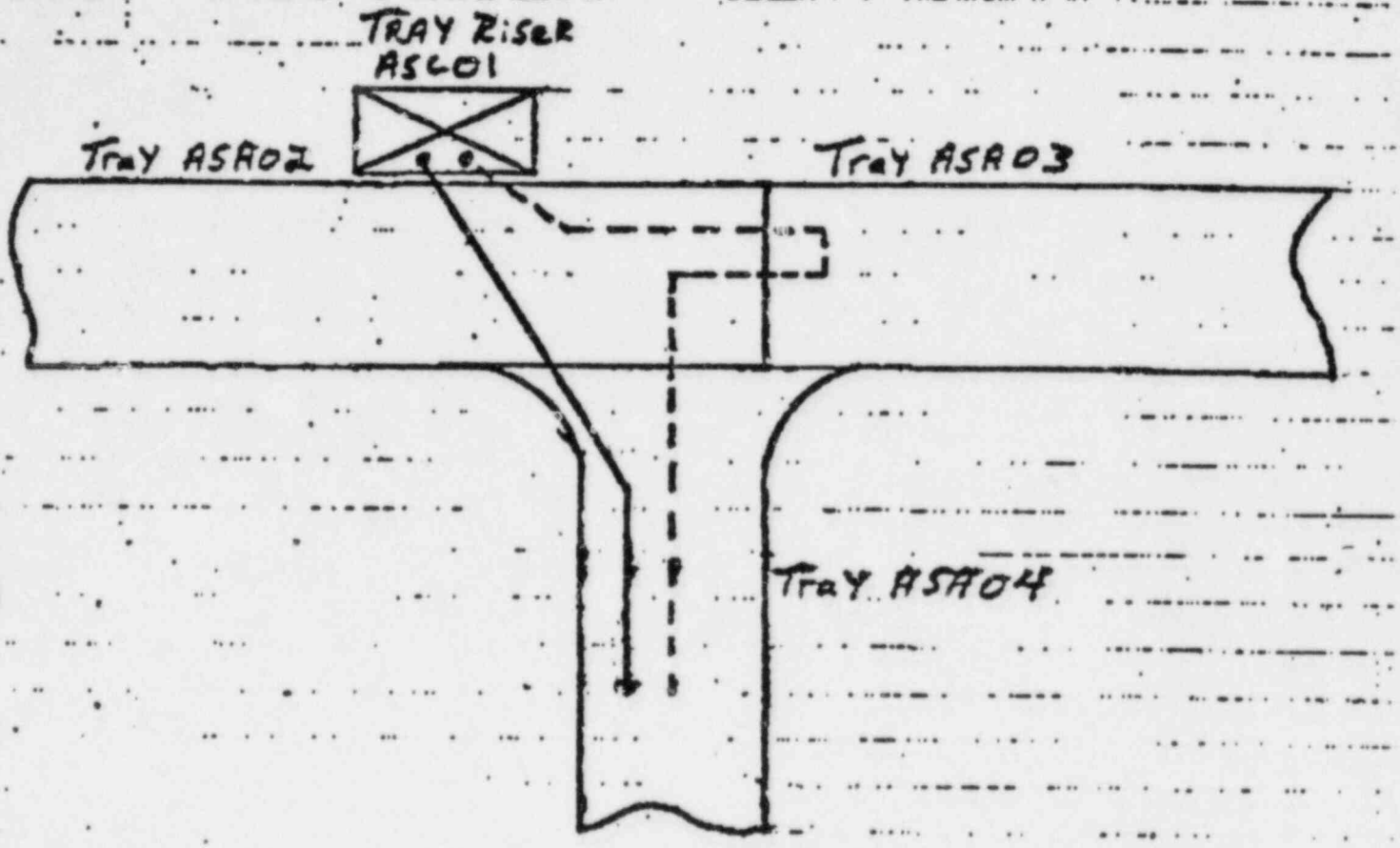
Reason for No Concern

Quality control will inspect all cable transitions from one raceway to another; this inspection will eliminate this concern.

Cable Code Design # B-2

QAB.69.09A and QAB.69.09B

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable as routed-by field

Cable should be -Per E-37

SK-2

Description of Basic Concern

Accountability; i.e., not knowing where a cable is pulled.

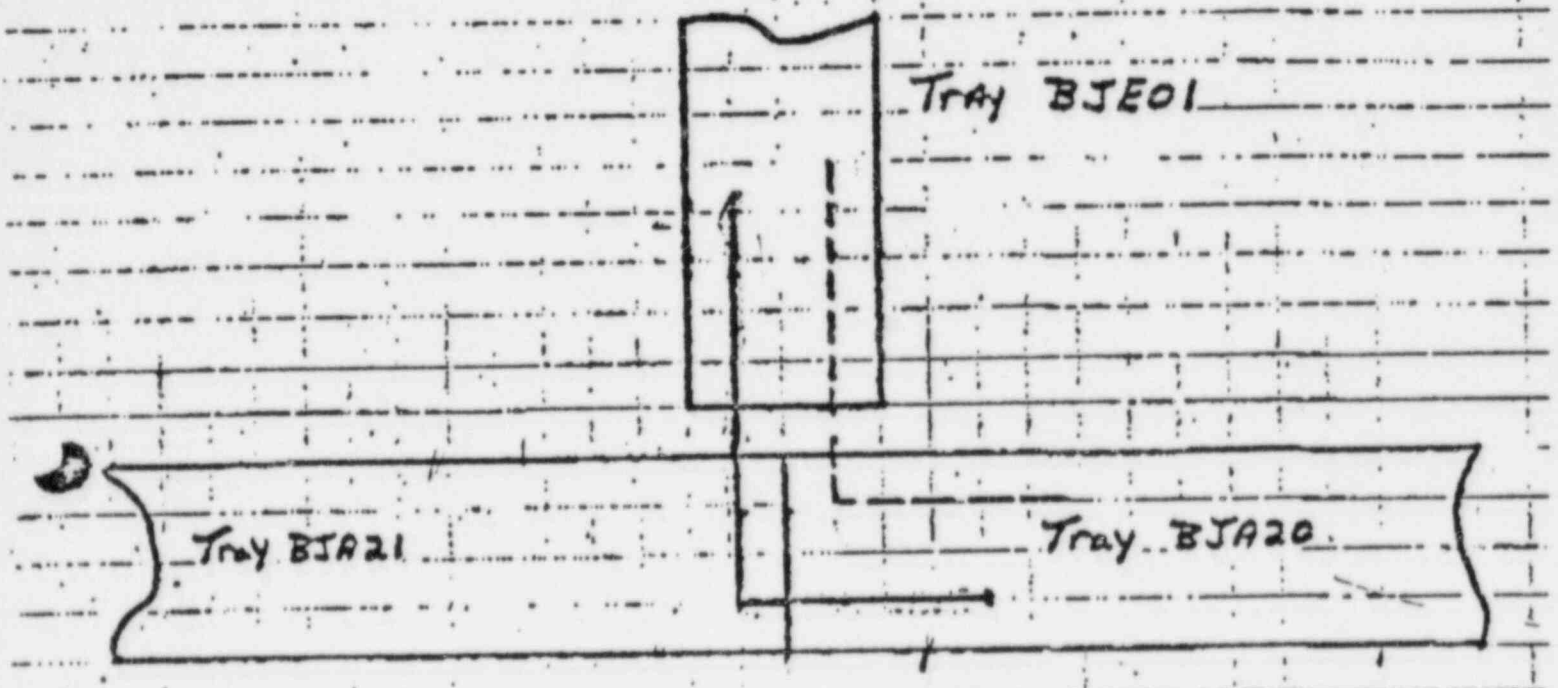
Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.

SK 3

Cable No. 1B82444 E
Code No. C-1
Design

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Trays are installed per E-36 and layout dwgs.

Cable as routed - By field

Cable should be - Per E-37

SK-3

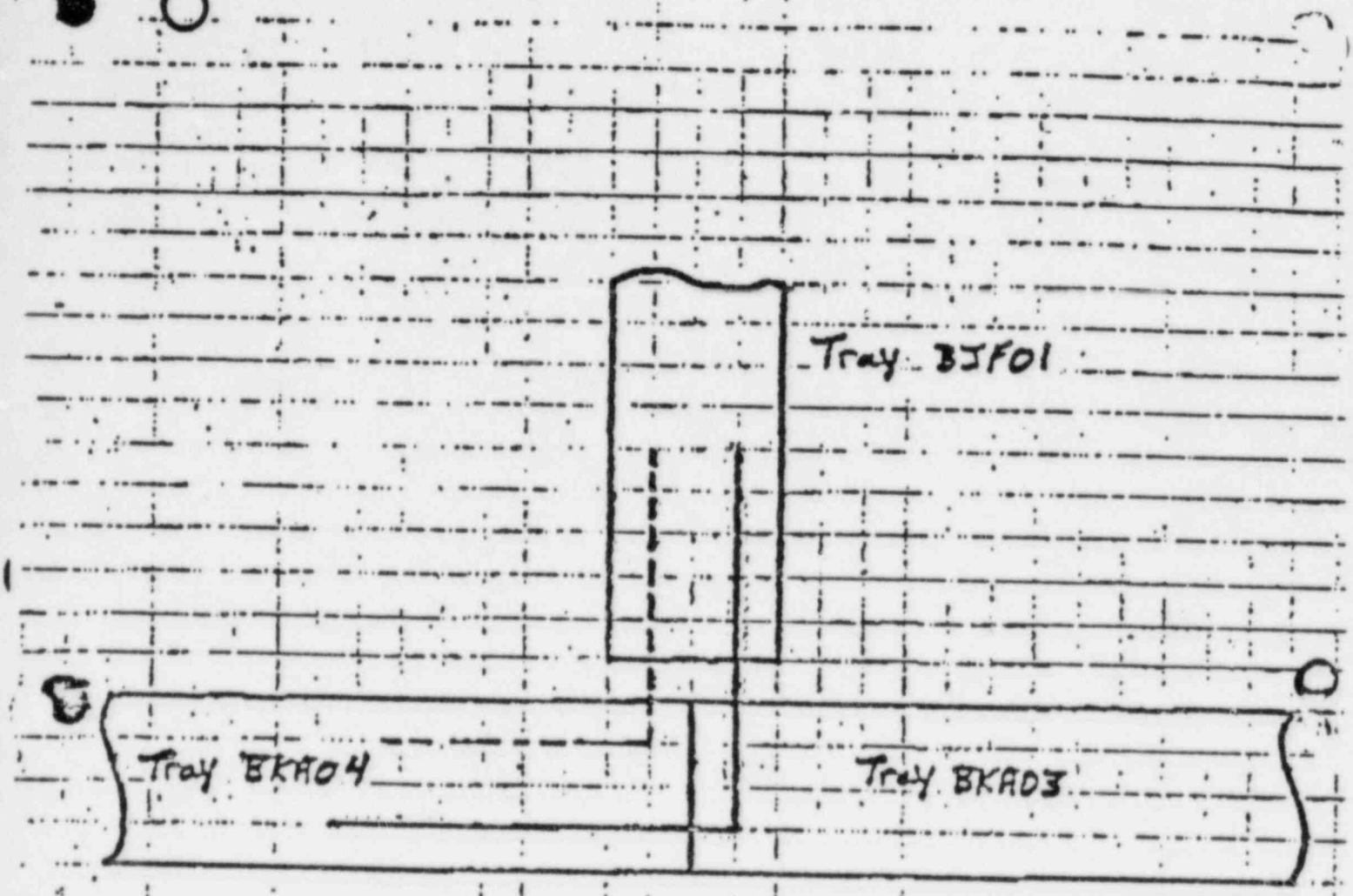
Description of Basic Concern

The subject cable enters the confines of an additional raceway. If the trays containing subject cable were required to be wrapped, how do we make sure that the cable portion in the unlisted via is protected.

Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping approximately 12 more inches at each end for safety.

Code # C-1
Design



Trays are installed per E-3b and lay out drgs.

Cable is routed by field

Cable should be - per E-37

PRELIMINARY

SK-4

Description of Basic Concern

The subject cable enters the confines of an additional raceway. If the trays containing subject cable were required to be wrapped, how do we make sure that the cable is protected.

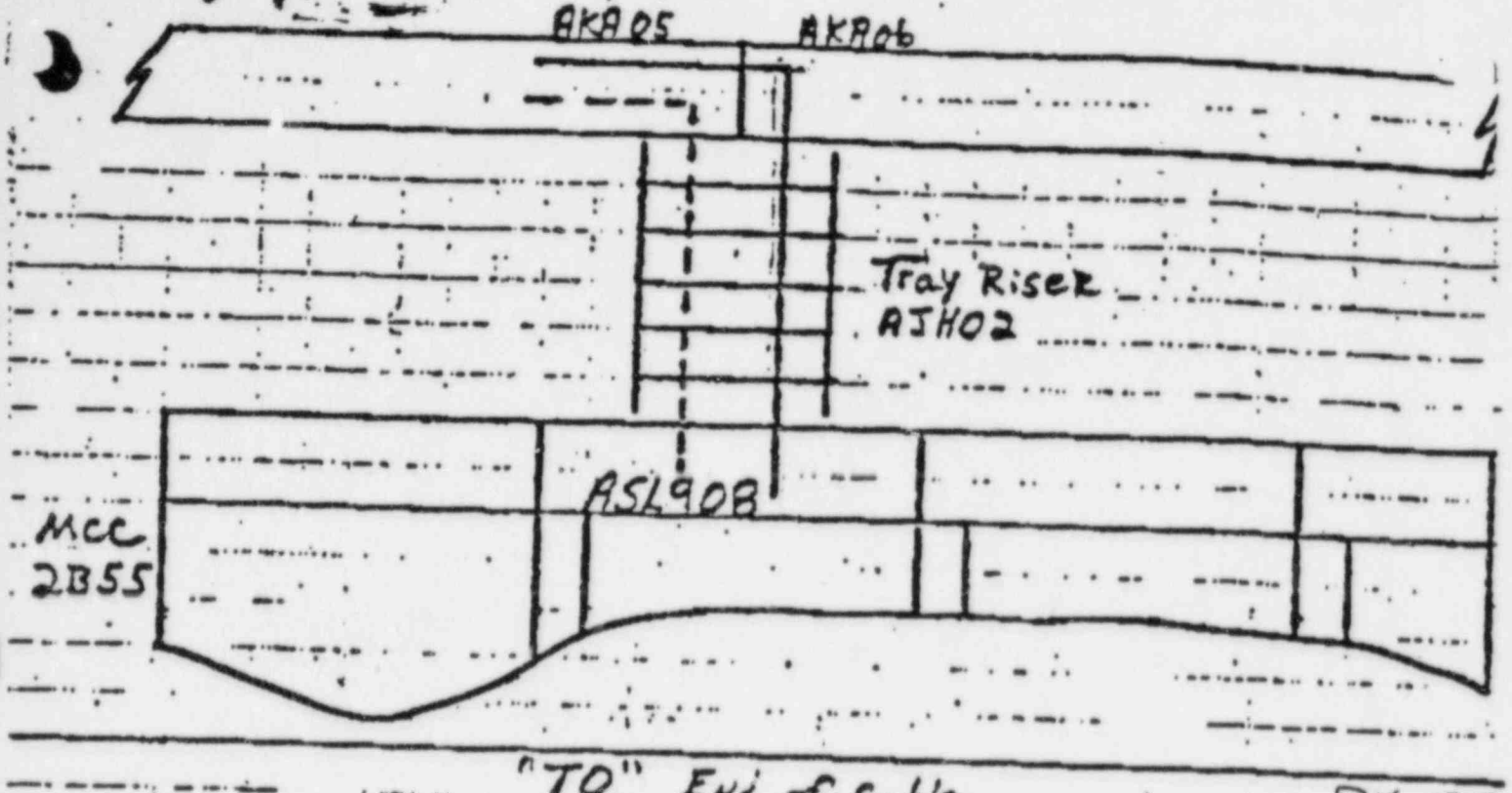
Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping to the edge of the violation and approximately 12 more inches at each end for safety.

Cable # 1AB553A
Code # A-1
Design

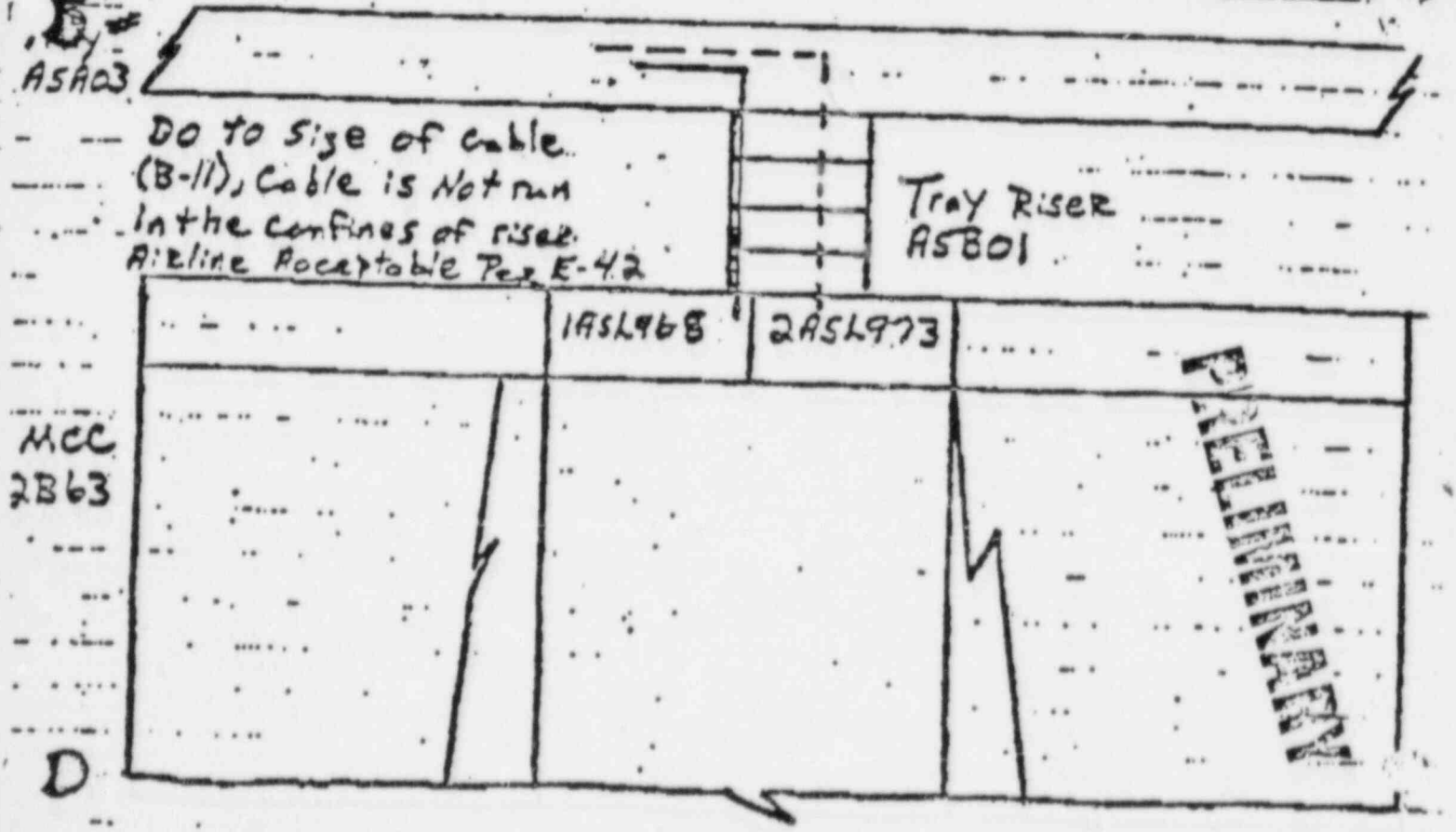
SK-5-A

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



"TO" End of Cable

SK-5-B



Cable is routed-by field

Cable Should be routed-per E-37

SK-5A and 5B

Description of Basic Concern - SK-5A

The subject cable enters the confines of additional raceway. Also, if the subject cable was required to be wrapped, how do we make sure that the cable is protected.

Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping to the edge of the violation and approximately 12 more inches at each end for safety.

Description of Basic Concern - SK-5B

Cable is airlined, and is not in the riser. It also enters the wrong slot number of the motor control center (MCC). The same slot has two numbers for ease of computer installation. Inspector might read the wrong number.

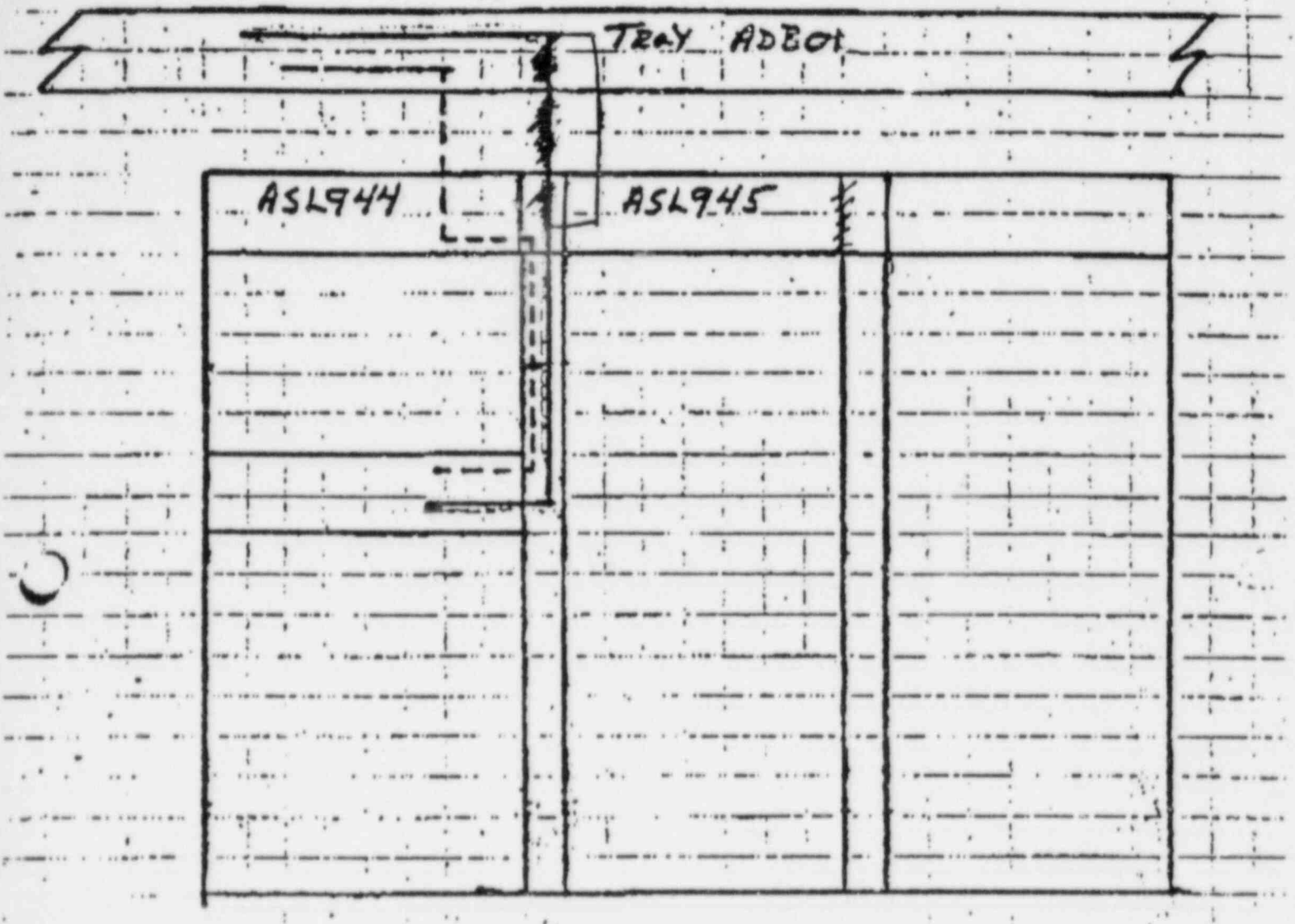
Reason for No Concern

A cable can be airlined 3 feet without engineering approval. The cable enters the correct stack (the subject stack of this MCC has two slot numbers; i.e., one opening, two numbers).

Cable # 1AB5301K
Code # A-1
Design

SK. 6

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is routed by field

Cable Should be routed per E-37

SK-6

Description of Basic Concern

Cable enters the wrong stack of the motor control center.

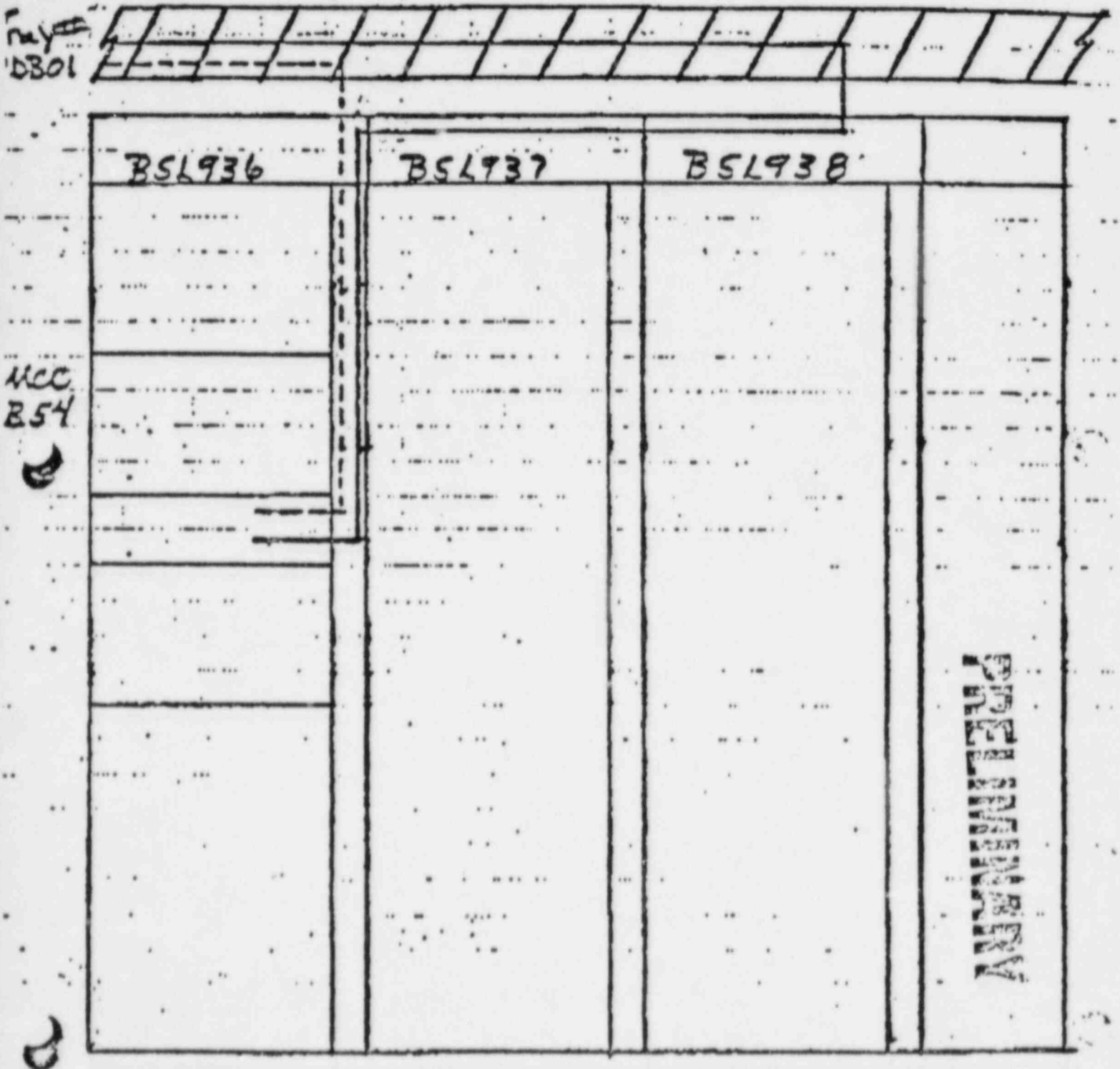
Reason for No Concern

A cable can enter any stack of a motor control center and be terminated because motor control centers are separated by channel.

SK-7

Cable # OBY3614A
Code # A-1
Design

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is routed by field
Cable should be routed per E-37

SK-7

Description of Basic Concern

Cable enters the wrong stack of the motor control center.

Reason for No Concern

A cable can enter any stack of a motor control center and be terminated because motor control centers are separated by channel.

Cable # 1AG1113E

SK 8

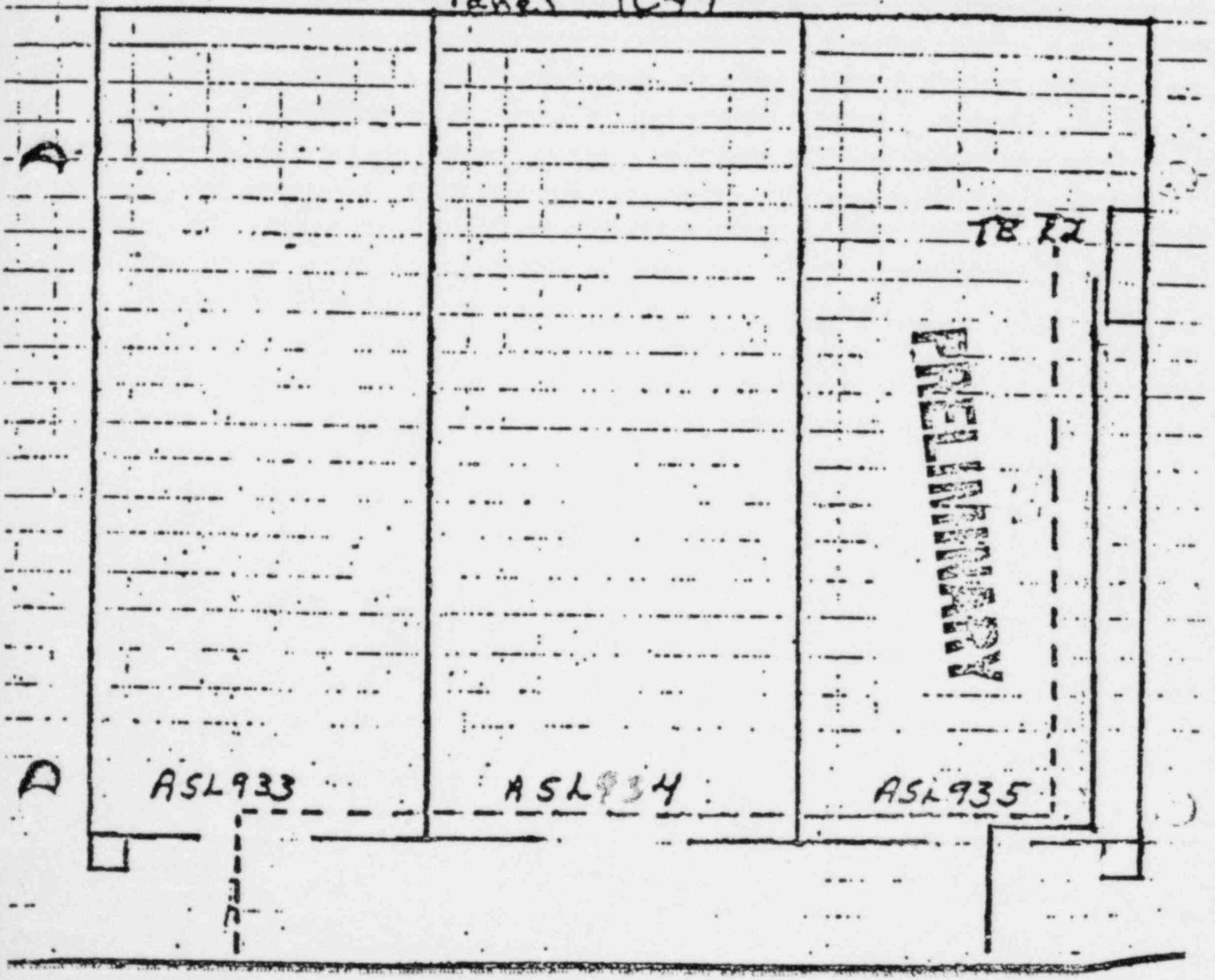
Code # A-L

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

Design

Is Routed-by field
Should be Routed-per E-37

Panel 1C44



SK-8

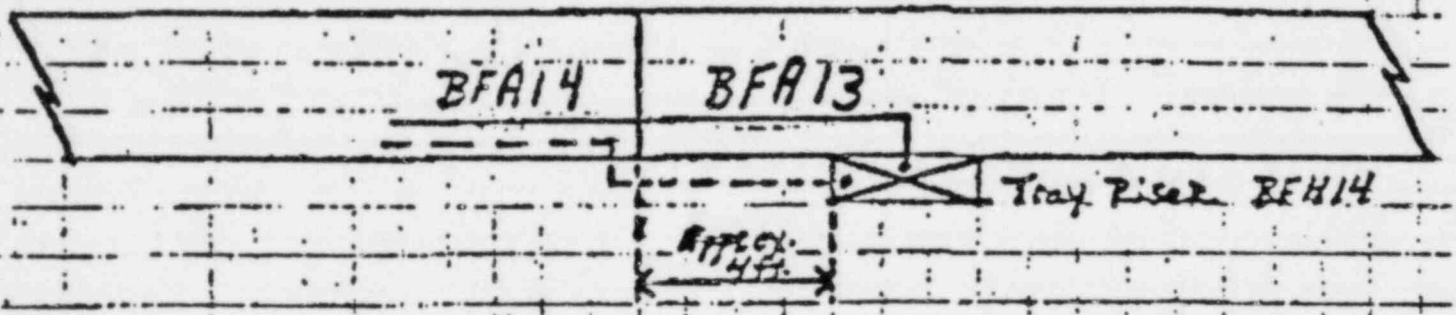
Description of Basic Concern

Cable was routed to the wrong compartment of the control panel. Field discovered E37 error then pulled and terminated cable at the correct compartment. E37 did not reflect as-built condition.

Reason for No Concern

When construction attempts to terminate a cable and discovers that the cable is in the wrong compartment, field engineering is notified of the problem.

Code Design # A-2



Cable is Routed by field
Cable should be Routed per E-37

PRELIMINARY

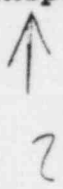
SK-9

Description of Basic Concern

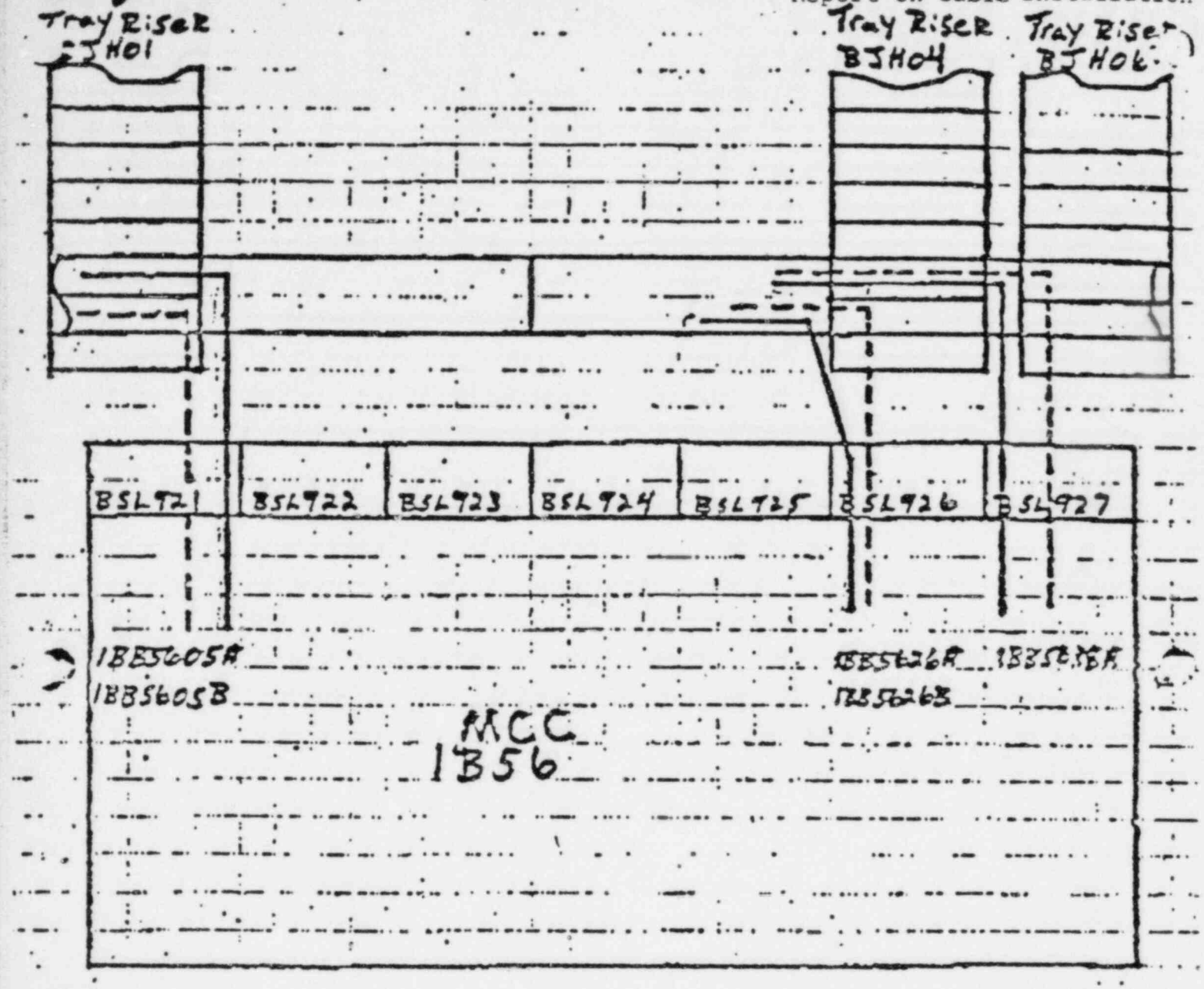
Accountability; i.e., not knowing where a cable is pulled.

Reason for No Concern

Engineering designed the cable to be airlined between E37 designated vias. The criteria, when in a case like this a Class 1E cable leaves the confines of a raceway, the subject cable will be visually inspected for possible separation violation. This inspection will discover this problem.



Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is Routed - By field

Cable should be - Per E-37

PRELIMINARY

SK-10

Description of Basic Concern

Cables are airlined, and are not in the riser.

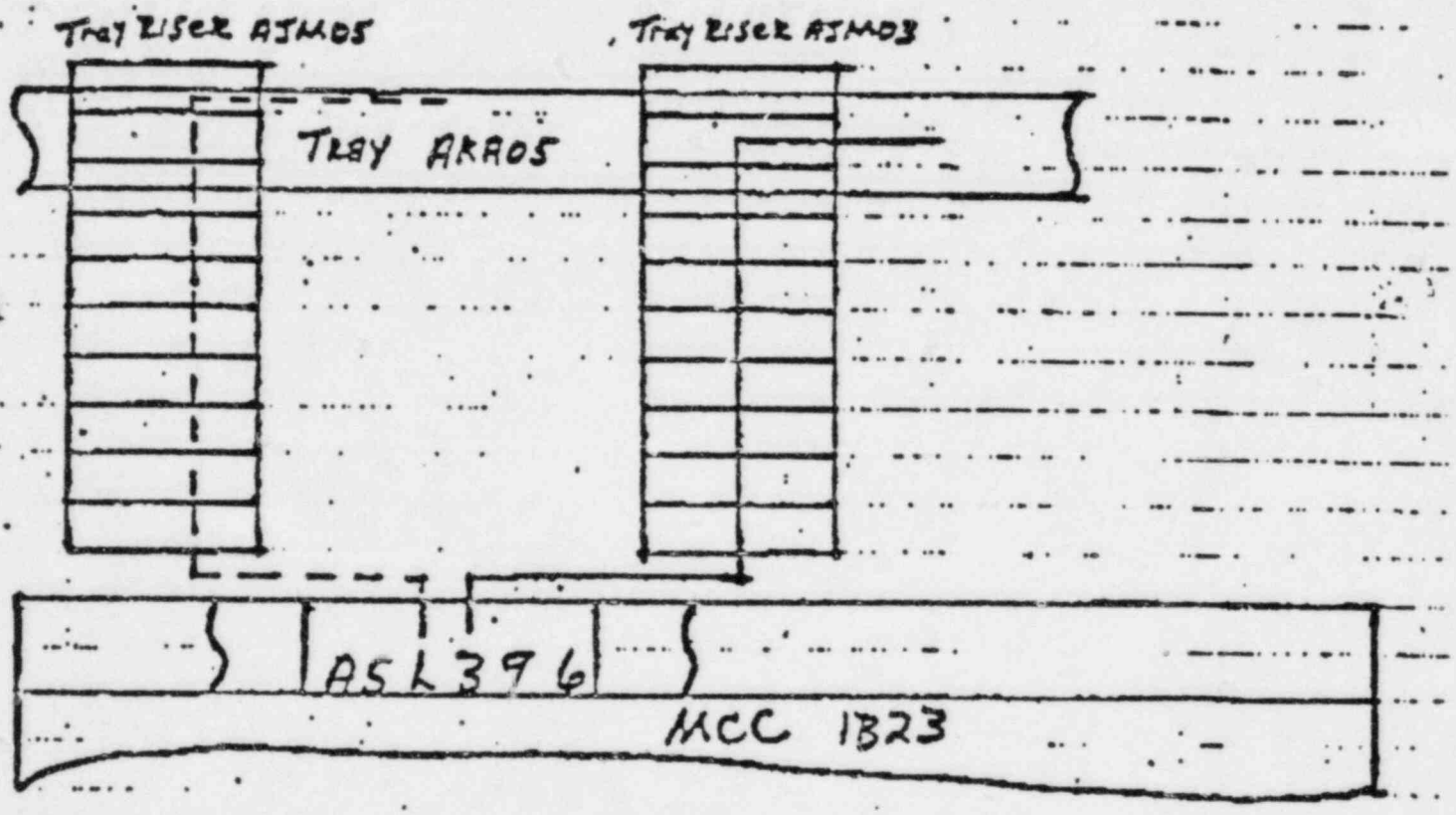
Reason for No Concern

A cable can be airlined 3 feet without engineering approval.

Cable # 1AB2321 A
Code # D-1
Design

SK-11

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is Routed - by field

Cable should be - Per E-37

PRELIMINARY

SK-11

Description of Basic Concern

Cable was pulled into tray AJM03 without engineering's knowledge.

Reason for Concern

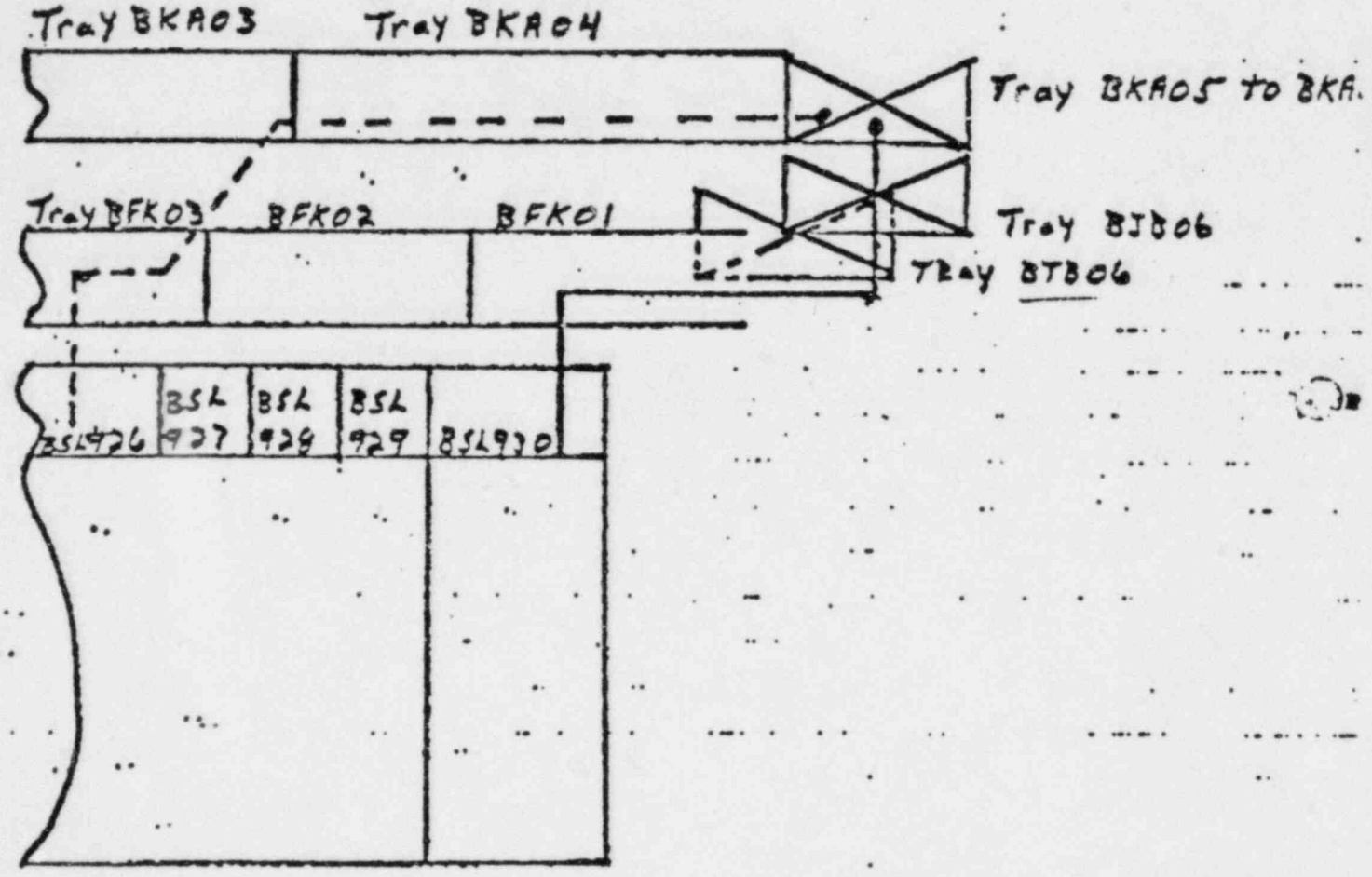
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Cable # 2BB5626A
Code # D-1
Construction

SK. 12

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is Routed - by field

Cable should be - Per E-37

PRELIMINARY

SK-12

Description of Basic Concern

Cable was not installed as routed in E37 and a voltage violation was created when a power cable was run in an instrumentation tray.

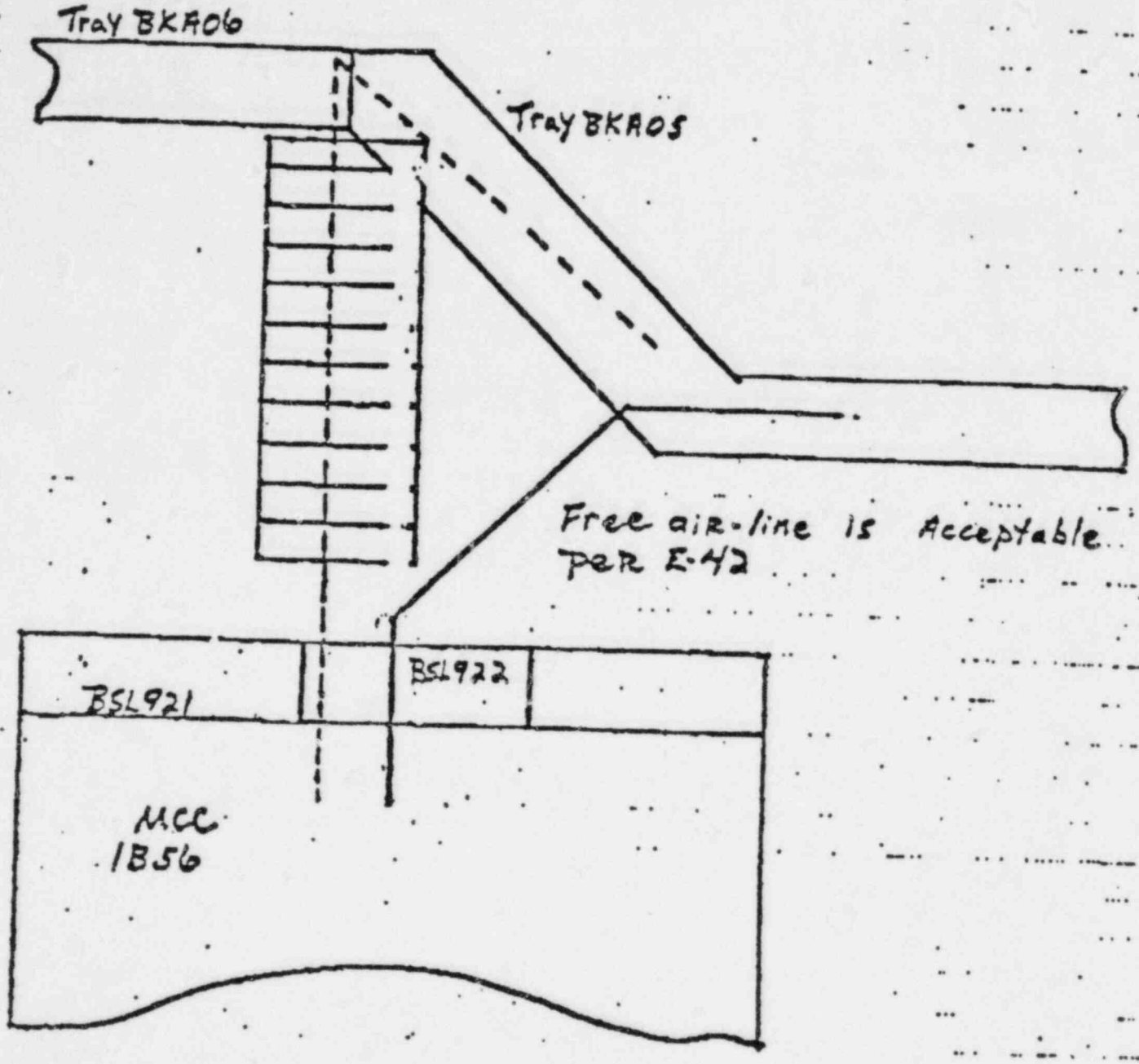
Reason for No Concern

Quality control will inspect all cable transitions from one raceway to another; this inspection will eliminate this concern.

Code ≠ 10036100
Design D-1

SK.13

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



PRELIMINARY

SK-13

Description of Basic Concern

Accountability; i.e., not knowing where a cable is pulled.

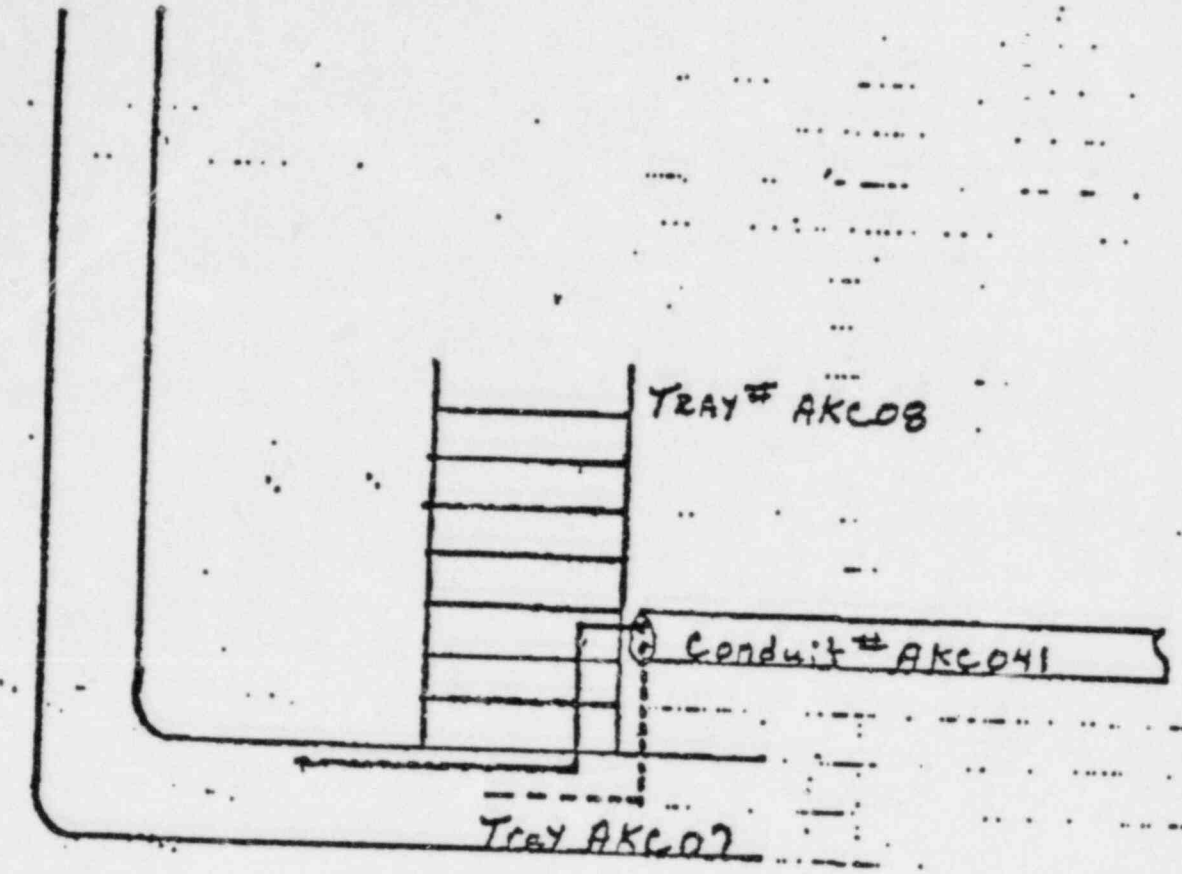
Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.

Cable # 1AB1704B
Code # B-1
Construction

SK.14

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is routed by field

Cable should be per E-37

PRELIMINARY

SK-14

Description of Basic Concern

The subject cable enters the confines of additional raceway. If the trays containing the subject cable were required to be wrapped, how do we make sure that the cable portion in the unlisted via is protected.

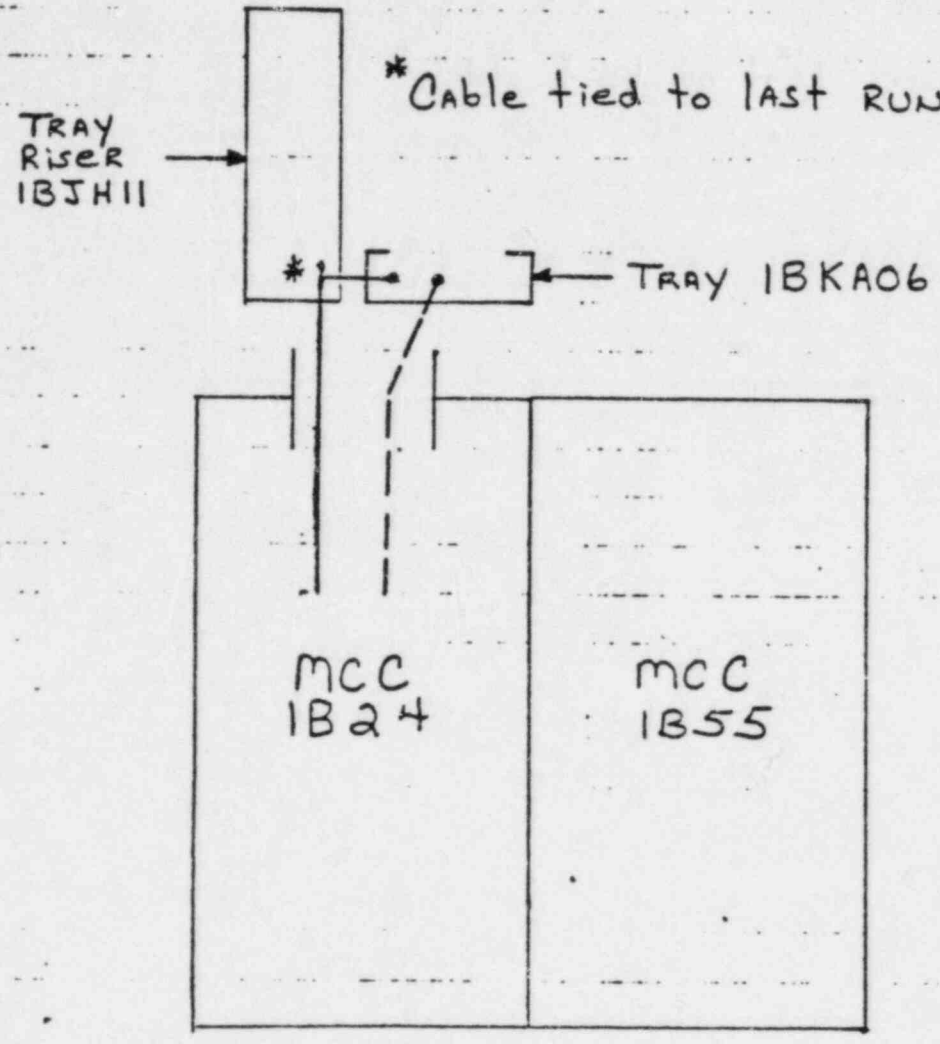
Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping approximately 12 more inches at each end for safety.

Cable # 1BB2444 Q
Code # C-1
Construction

Sk # 15.

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



——— Actual cable route in field

— — — — Cable route per E-37

PRELIMINARY

SK-15

Description of Basic Concern

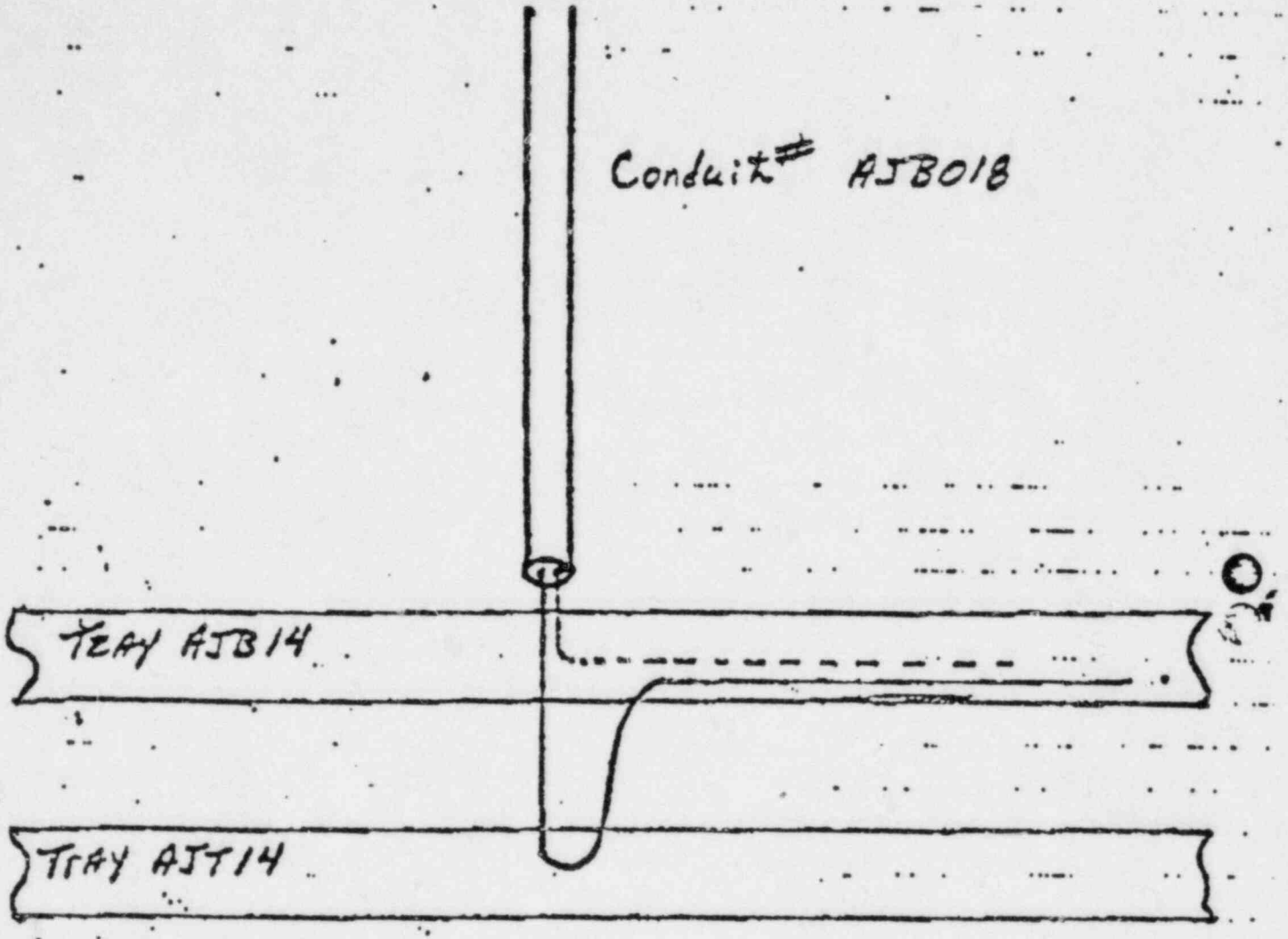
Cable is pulled into BJH11 which was not one of its assigned vias.

Reason for No Concern

The cable is only tied to the last rung of the riser, and will not contribute to thermal loading of the riser.

Cable #'s 1AFW021B and 1AFW082E SK-16
Code # C-1
Construction

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



——— Cable is routed - by field.

- - - - - - - Cable should be - Per E-37

Cables were looped out of the bottom of tray AJB14 and into conduit AJB01B so that Min. bend Radii would not be violated and for ease of cable pulling.

Condition at interim training. Q.C. to inspect final training and bundling during area walkdown.

PRELIMINARY

SK-16

Description of Basic Concern

Cables looped out the bottom of tray AJB14 into tray AJT14.

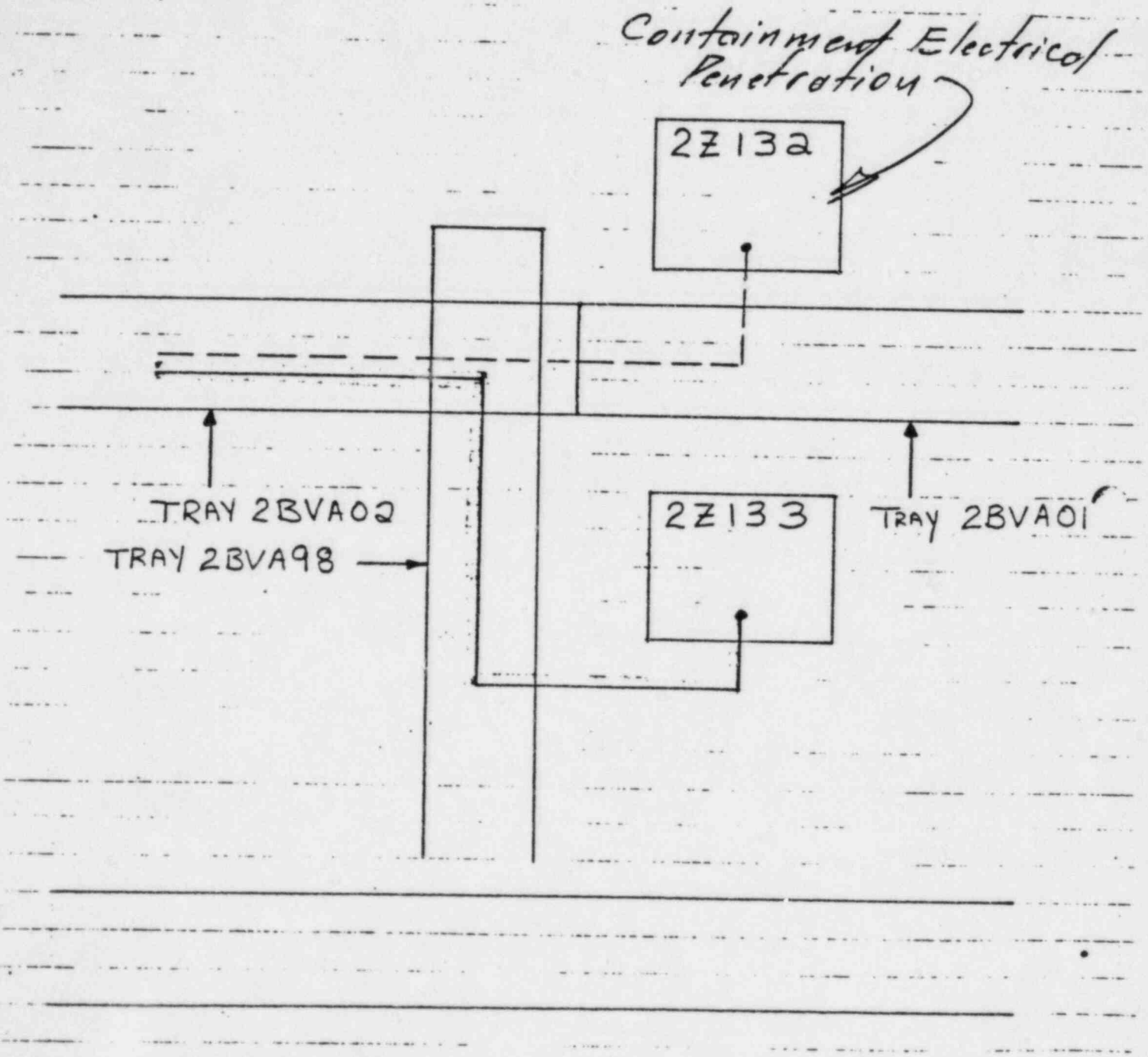
Reason for No Concern

As a normal procedure, construction eliminates all slack from cables before tying them down. With this procedure accomplished, this concern will not be a problem.

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

SL# 17

Cable # 2BI067 A
Code # D-1
Construction



Cable Route per E-37

Actual Route of cable in field

SK-17

Description of Basic Concern

Cable is pulled to the wrong penetration.

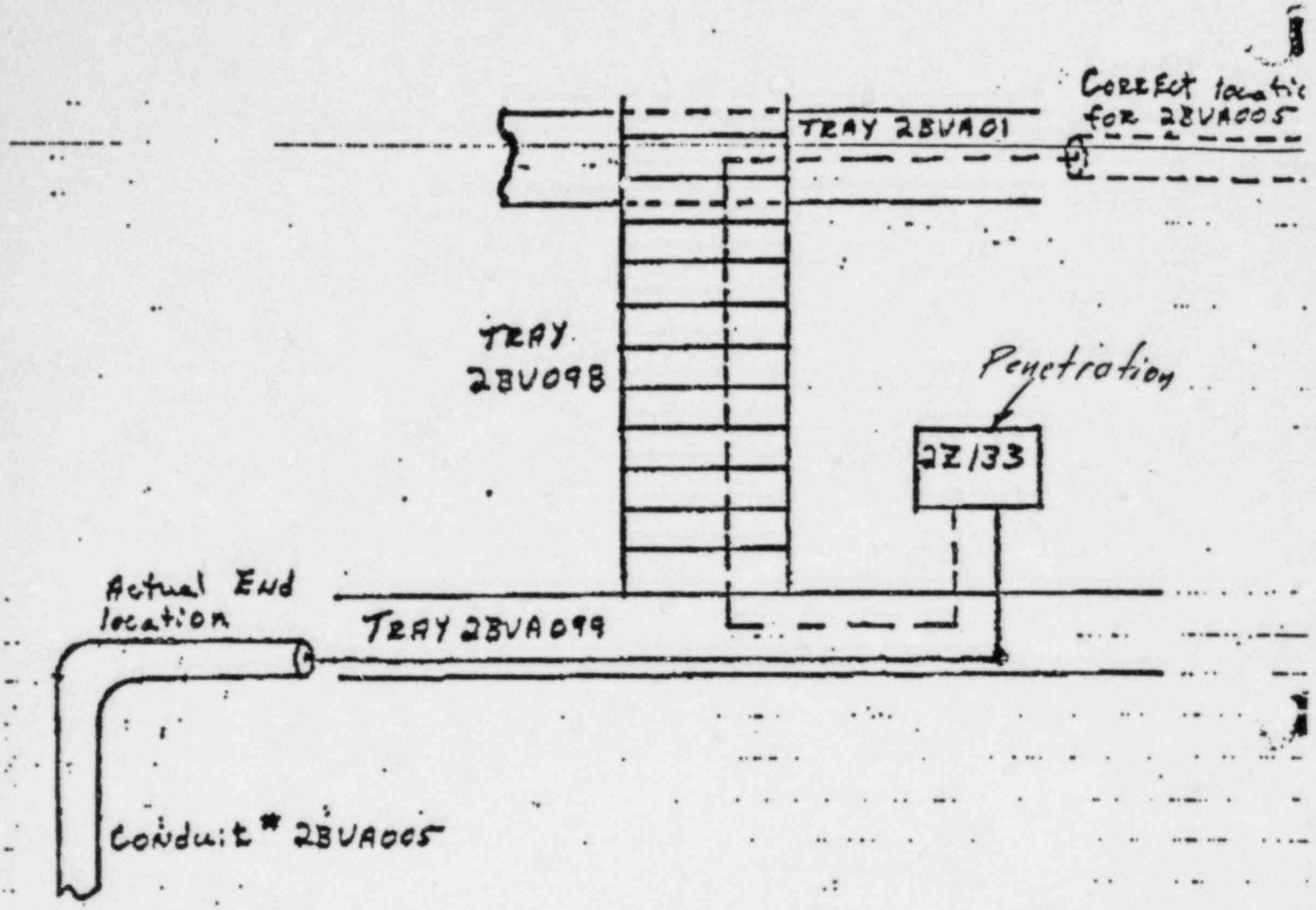
Reason for No Concern

When construction attempts to terminate a cable at a penetration and discovers that the cable is not at the proper penetration, field engineering is notified of the problem.

1

Cable # 2BI004A and 2BI003A SK 18
Code # B-1
Construction #6

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Conduit # 2BVA005 Installed at incorrect End location

Should run to 2BVA01 ± 18" into adjoining tray section

Cables Vias per E-37 are: BVA005 BVA01 BVA98 BVA99

Due to incorrect End location: BVA005 — — BVA99

———— Cable is routed - By field

– – – – – Cable Should be - Per E-37

SK-18

Description of Basic Concern

Because of incorrect conduit installation, the cable was pulled incorrectly.

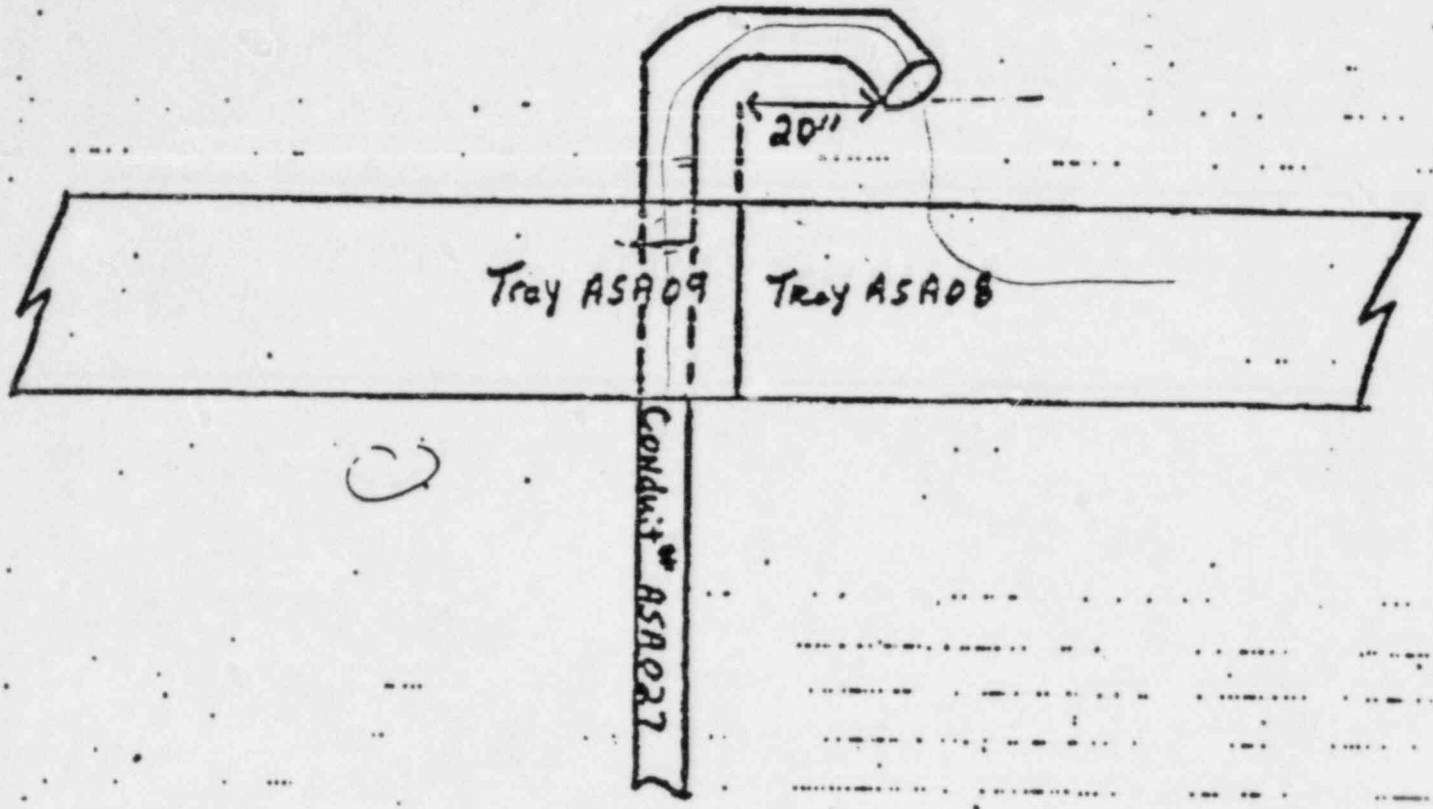
Reason for No Concern

The subject conduit installation had not been inspected by quality control. On discovering the incorrect conduit installation, cable misinstallation would have been corrected.

Cable # OAB6501N
Code # B-1
Construction

SK. 19

Midland Plant, Units 1 and 2
Attachment 3 to
Report on Cable Installation



Conduit # ASA027 Installed at incorrect END location.

Should run to ASA09 ± 18" into adjoining tray section.

Cable Vias per E-37 are: ASA027 ASA09 ASA08

Due to incorrect END location: ASA027 —— ASA08

PRELIMINARY

SA-19

Description of Basic Concern

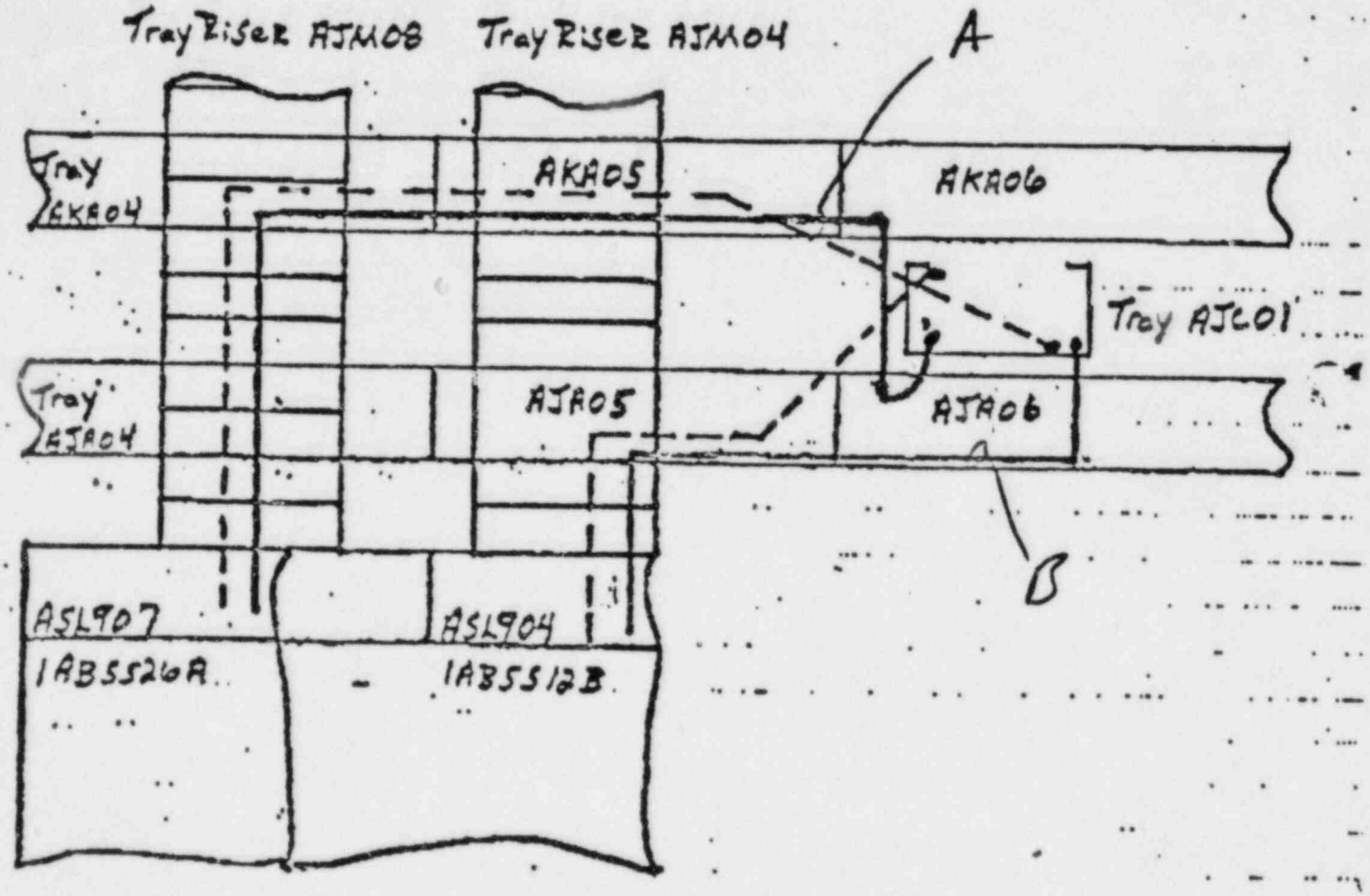
Accountability; i.e., not knowing where a cable is pulled.

Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.

Cable # 1AB5526A and 1AB5512B
Code # D-1
Construction

SL 20



Cable is routed - by field

Cable Should be - Per E-37

PRELIMINARY

SK-20

Description of Basic Concern

Cables were pulled into trays AKA06 and AJA06, which were listed as vias in E37, without engineering's knowledge.

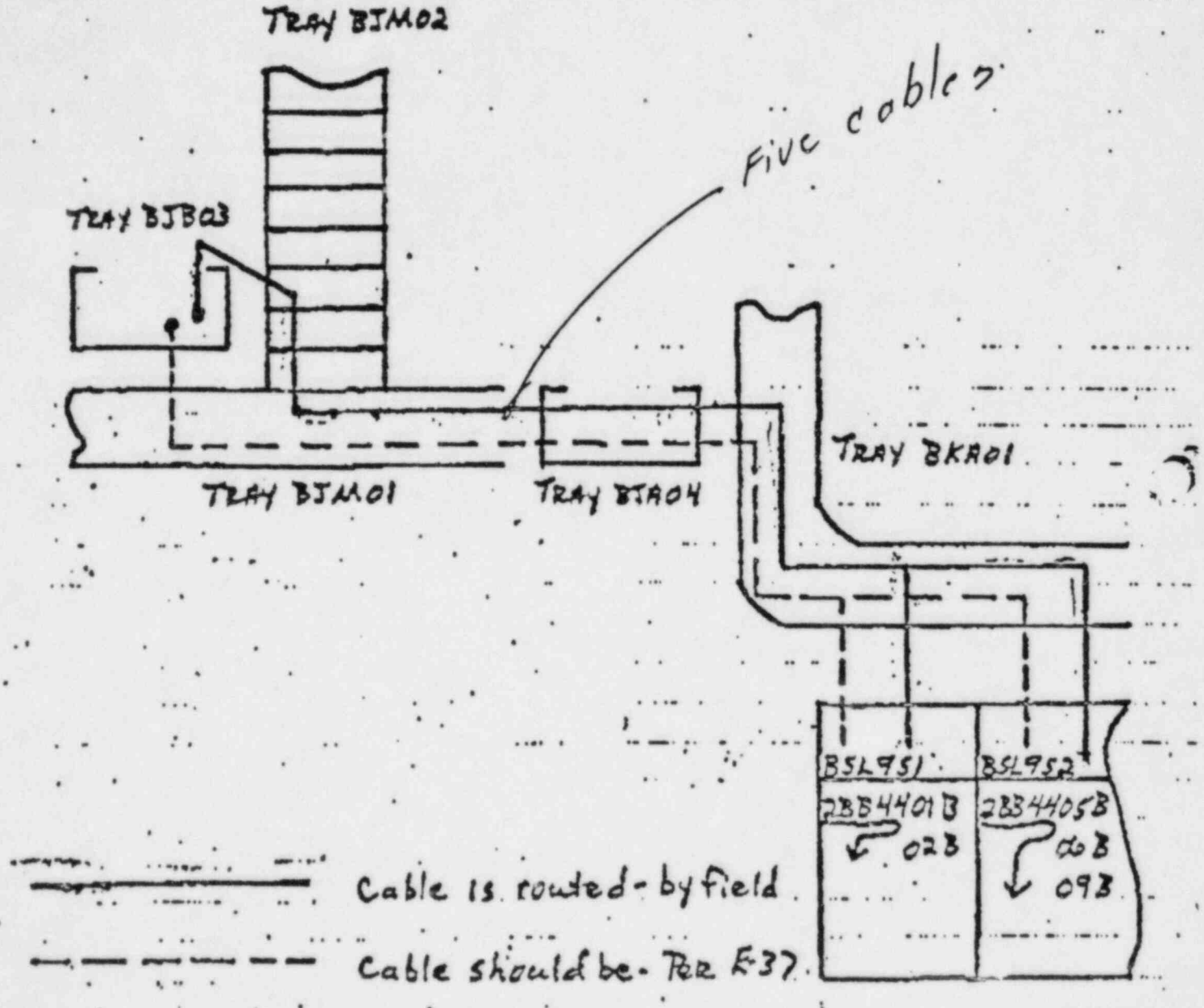
Reason for Concern

Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Cable #'s 2BB4401B 02B 05B 06B 09B . SK-21
Code # D-1
Construction :

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



SK-21

Description of Basic Concern

Cables were pulled into tray BJM02, not in E37 vias, without engineering's knowledge.

Reason for Concern

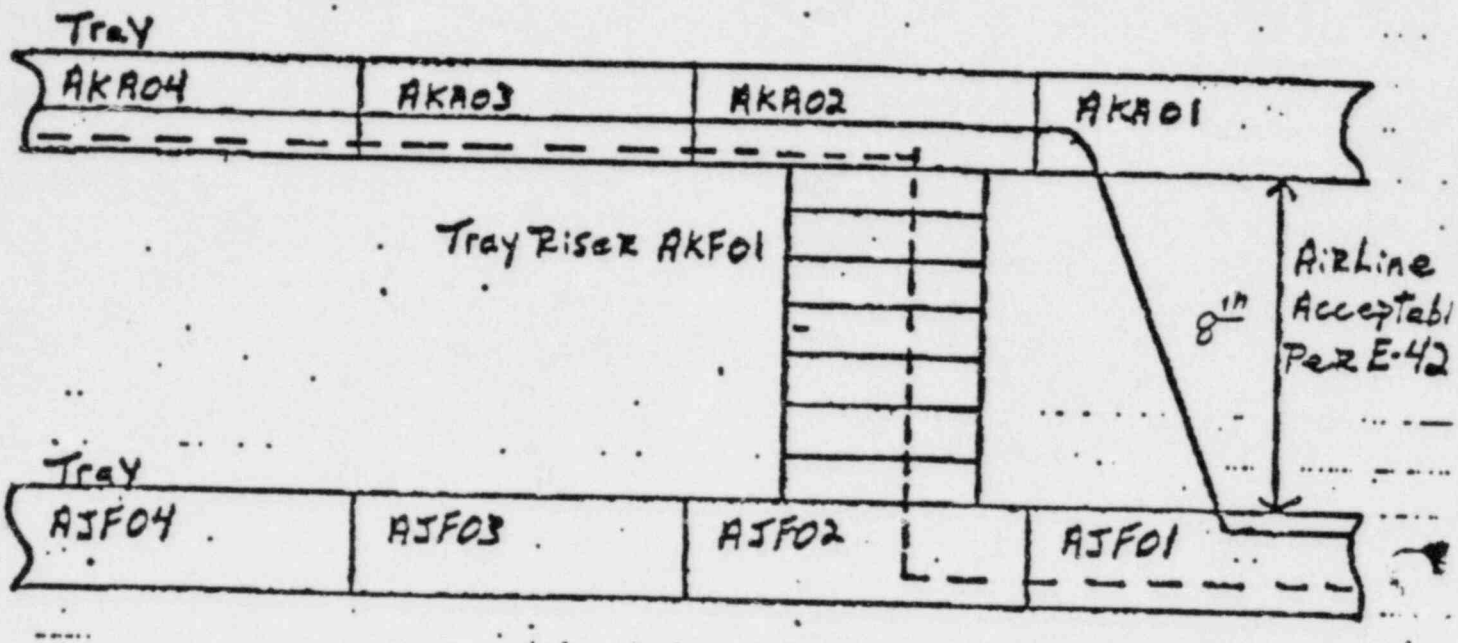
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Code # D-1
Construction

SK. 22

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable Is Routed - by field

Cable Should be - Per E-37

PRELIMINARY

SK-22

Description of Basic Concern

Cables were pulled into tray AKA01, not in E37 vias, without engineering's knowledge.

Reason for Concern

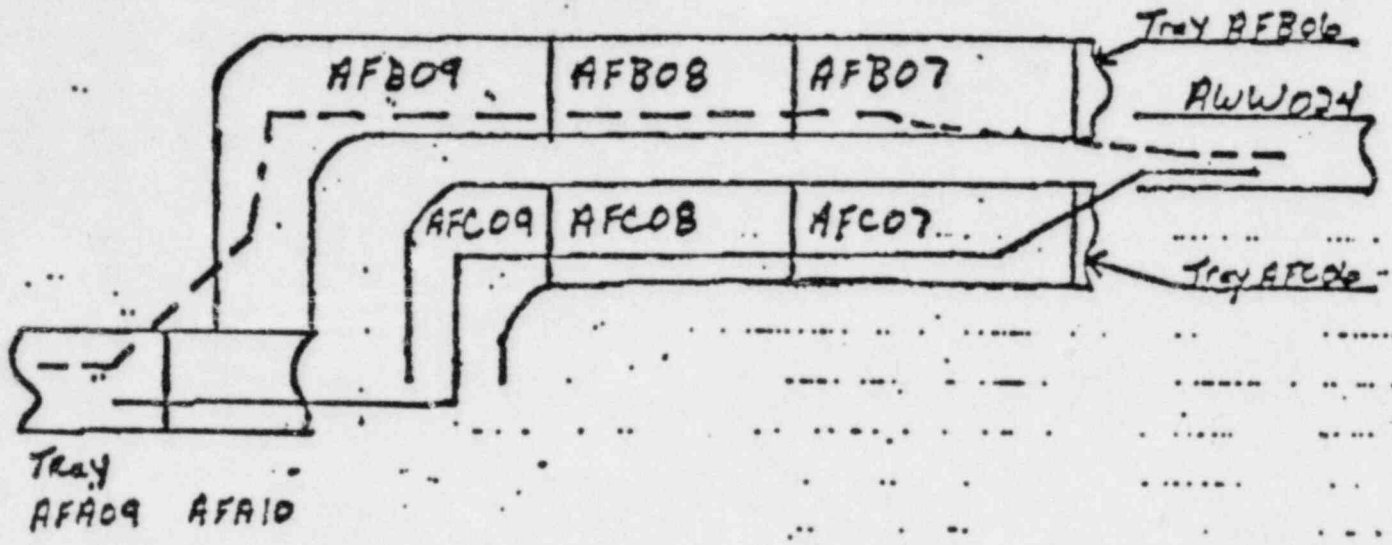
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in that tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Cable = OAB4511 M
Code = D-1
Construction

SK. 23

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is routed - by field

Cable Should be - Per E-37

PRELIMINARY

SK-23

Description of Basic Concern

Cable was pulled into tray AFC07-09, not listed in E37 vias, without engineering's knowledge.

Reason for Concern

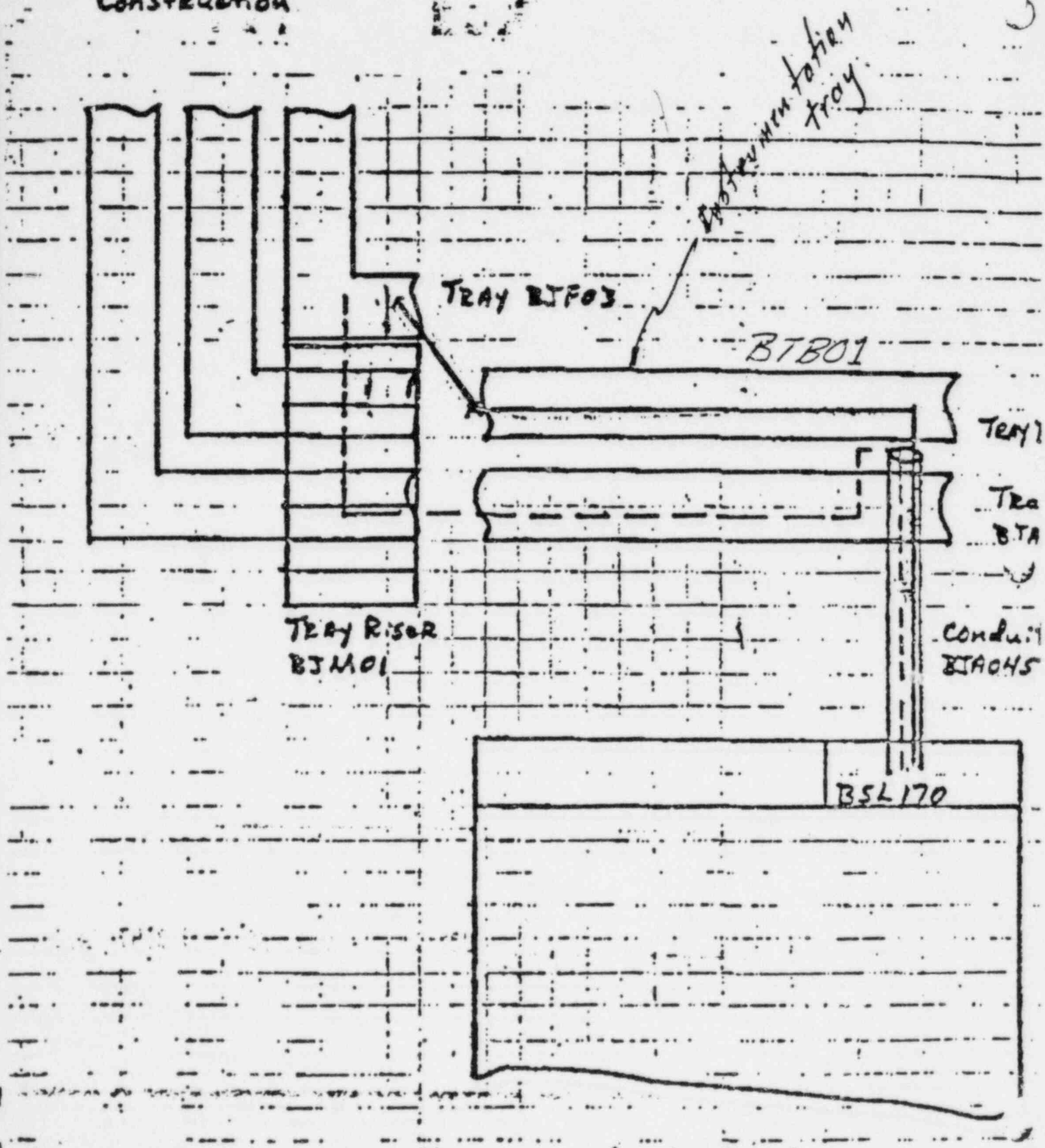
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray m st be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

SK-24

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

Cable # 5 1BQH03 D 1 E
Code = D-1
Construction



Cable is routed by field

Cable Should be- Per E-37

SK-24

Description of Basic Concern

Voltage violation - Control cables used instrumentation raceway.

Reason for No Concern

Quality control will inspect all cable transitions from one raceway to another; this inspection will eliminate this concern.

Code = D-1
Consteuction & Design

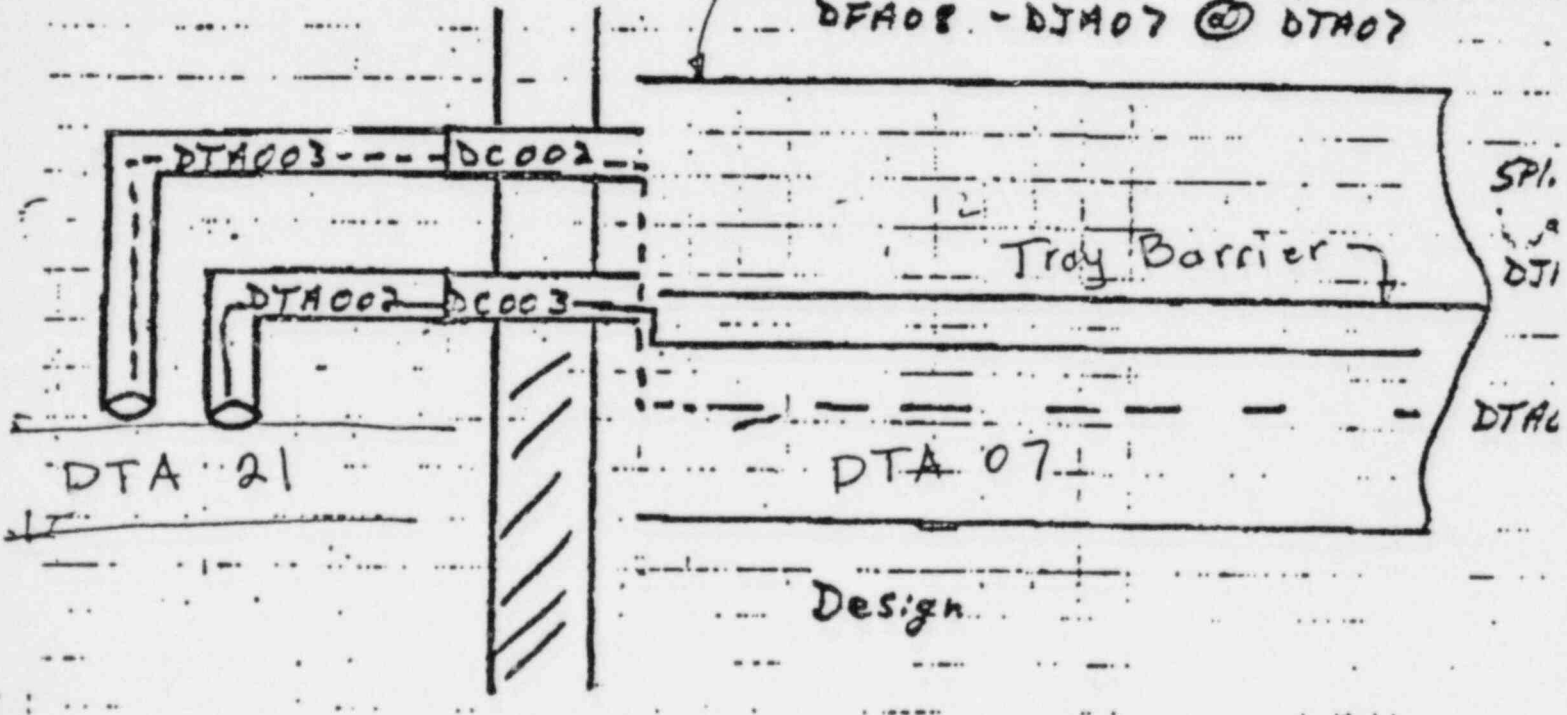
Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

SK-25

1DQ157A
1DQ396 D, F, H, L, AT
1DQ127 E, D+E
1DQ173 D, E+F
1DQ181 B, D, F+H

DJA 01
DFA 01

Troy Consteuction
CROSS OVER of Seperayors.
DFA08 - DJA07 @ DTA07



Cable routed by Field

Cable Should be Per E-37

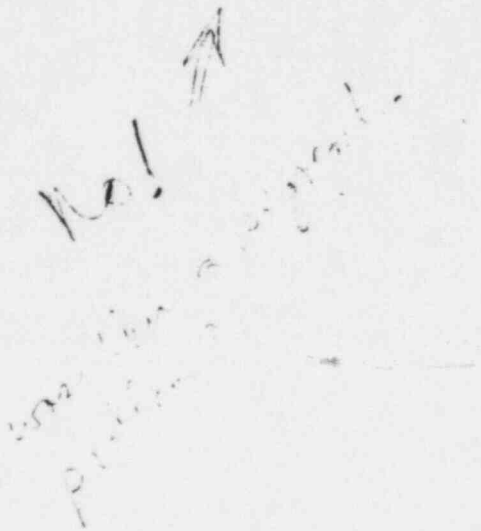
SK-25 Unique Case

Description of Basic Concern

Sixteen small instrument cables were pulled into the wrong conduit.

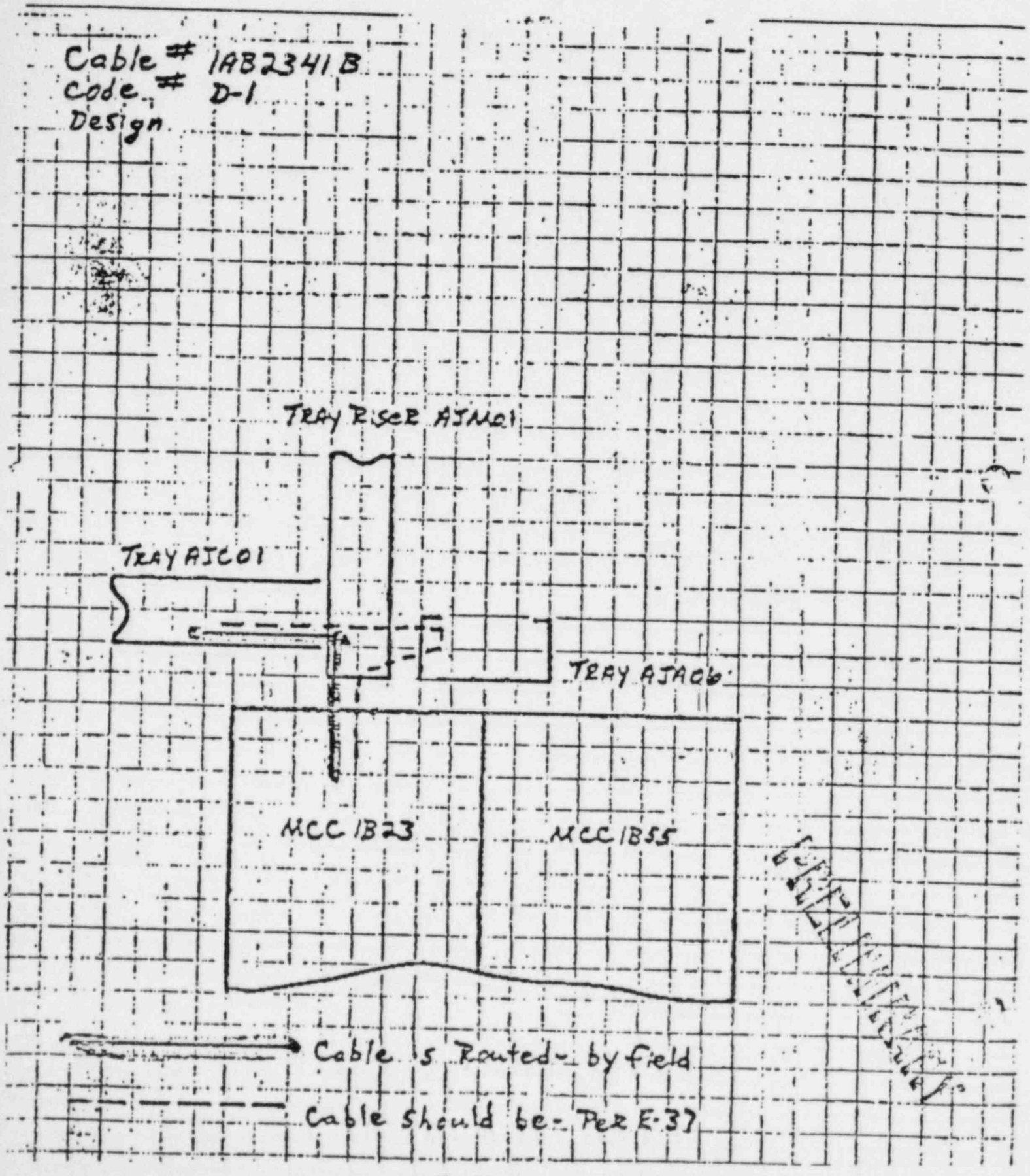
Reason for No Concern

There is ample room in conduit DTA002/DC003 for the additional cable. There are no thermal concerns. This was a unique case because the subject conduits and cables had undergone successive renumbering and relocation after initial installation 1) to accommodate neutron detector cables and 2) because a steel beam blocked access to some of the conduit sleeves. The many changes may have caused confusion which led to the misinstallation of the cables. It is not credible that this situation would be repeated elsewhere; therefore, it constitutes a unique case.



SK-26

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



SK-26

Description of Basic Concern

Accountability; i.e., not knowing where a cable is pulled.

Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.

(5)

Consumers Power Company

James W Cook
Vice President - Projects, Engineering and Construction

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0453

June 11, 1982

Mr J G Keppler, Regional Administrator
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND PROJECT -
INSPECTION REPORT NO 50-329/82-06 & 50-330/82-06, ITEM 2
FILE: 0.4.2 SERIAL: 17513

References: (1) NRC Letter, C E Norelius to J W Cook, dated April 26, 1982, transmitting Inspection Report 82-06

(2) CPCo Letter, J W Cook to J G Keppler, dated May 28, 1982, Serial 16182, responding to Inspection Report 82-06

Reference (1) deals with misinstalled cables and incomplete cable reel numbers. A meeting was held in Glen Ellyn on May 14, 1982, at which time Consumers Power presented a draft report on misinstalled cables. This letter, as promised by Reference (2), provides the released report on misinstalled cables. The released report has been updated to address the comments generated during the May 14 meeting. The report also provides the dates for which the corrective actions will be completed in order to put the plant in full compliance. A special training session (QCT-1616) was conducted for Bechtel Quality Control on PQCI E-4.0, "Cable Pulling," on March 15, 1982. This training emphasized Activity 2.5 of the PQCI which concerns itself with cable vias, especially in regard to the type of problems identified during the Special Overinspection of cable routing. This training along with the continued emphasis in the training and certification of new electrical QC engineers provides the process corrective action to help assure better performance in this area.

With regard to cable reel numbering, the following actions have been taken to correct the specific instances and to preclude recurrence:

1. The cable reel numbers have been corrected, as necessary.

2. A cable reel list, with a cross-reference between the old numbers recorded and the real numbers that incorporate the purchase order number and the manufacturer's reel number, has been made a part of the E-4.0 "Cable Installation" record files in the QC vault.

~~8209080665~~

JUN - 4 1982

3. The number being recorded on inspection records at this time does incorporate the purchase order number and the manufacturer's reel number.

NCR M01-9-2-022 which documents these actions was closed on 5/17/82 and the plant is now in full compliance.

Consumers Power Company

By James W. Cook
James W Cook

Sworn and subscribed to before me on this 14th day of June, 1982.

Barbara L Swanson
Notary Public, Jackson County, Michigan

My commission expires September 8, 1984

WRB/BWM/lr

CC: RJCook, NRC Resident Inspector, Midland Site (w/enc)
RLandsman, NRC Region III (w/enc)
RGardner, NRC Region III (w/enc)

Enclosure: "Report on Cable Installation, Midland Plant Units 1 and 2, June 4, 1982"

REPORT ON CABLE INSTALLATION

MIDLAND PLANT UNITS 1 AND 2

JUNE 4, 1982

PREPARED BY

BECHTEL POWER CORPORATION

REPORT ON CABLE INSTALLATION

MIDLAND PLANT UNITS 1 AND 2

CONTENTS

ATTACHMENTS

I. INTRODUCTION

PURPOSE

This report describes the evaluation of the results of a major overinspection [i.e., an inspection made by Midland Project Quality Assurance Department (MPQAD) of a previous inspection by Bechtel Quality Control (QC) of the installation of Class 1E cable at the Midland site]. It also describes actions to date, and actions yet to be taken, to address the generic implications of any undetected misinstallations in the remainder of the Class 1E cables not overinspected.

BACKGROUND

NRC Region III Inspectors R. Gardner and R. Love participated in a special team inspection at the Midland site May 18 through 22, 1981. One result of this inspection was an NRC question on the adequacy of the qualification of certain QC electrical inspectors and the process by which they were certified. The NRC considered the acceptability of the inspections performed by these inspectors to be indeterminate and requested that MPQAD perform an audit of QC to determine the adequacy of this training, qualifications, and examinations prior to their certifications. This matter was left as an unresolved item (NRC Item Number 50-329/81-12-08; 50-330/81-12-09).

MPQAD performed the requested audit in June 1981. The NRC concluded that the MPQAD audit results were partially "inconclusive" and requested that MPQAD perform another audit. In addition, the NRC requested that MPQAD perform overinspections of selected installations.

MPQAD performed the second audit in November 1981. Bechtel QC began to include on-the-job training as part of the personnel certification records. Subsequently, NRC Inspection Report 50-329/82-06; 50-330/82-06 closed the unresolved item by concluding that the training, qualifications, and examinations for certification meet applicable requirements.

OVERINSPECTION RESULTS

MPQAD also performed the requested overinspections. Attachment 1 summarizes the results of the overinspections of 1,084 cable installations. Misinstallations identified during that overinspection were documented on nonconformance reports (NCRs), which are given as Attachment 2.

NONCONFORMANCE REPORT DISPOSITIONS

The NCRs identified 55 cables as misinstalled in part. The 55 cables were evaluated by Bechtel project engineering based on the specifics of each case and the appropriate design criteria. Each case was determined to have no impact on safety. Fifty-two cables were dispositioned "use as is," and the remaining three cables were dispositioned "rework." Subsequent review and verification of the disposition actions will be made by MPQAD prior to closure of the NCRs.

II. CASES NOT OF GENERIC CONCERN - NO FURTHER ACTION NEEDED

Section I described how the 55 specific cases of cable misinstallation were dispositioned. Each type of misinstallation had to be dispositioned generically, as well. In other words, not only must the 55 specific cases be dispositioned, but each type of case also must be dispositioned with the assumption that the misinstallation could occur anywhere in the plant and remain undetected.

This section identifies the types of cases which are generically dispositioned to be of no concern, therefore warranting no further action. For each case of this type, the rationale is provided as to why it is not of generic concern.

Attachment 3 includes a table, definition of terminology and a list of each of the 55 specific cases. This table also identifies each case as belonging to one of two categories - "No Further Action Needed" or "Further Action Needed." Cases described in this section of the report all fall into the "No Further Action Needed" category.

The cases not of potential generic concern are as follows:

1. Five cables were found to enter or leave tray in locations other than as specified in Drawing 7220-E-37. These cable installations did not use all designed tray vias (raceway sections) but also did not use any additional trays. These were evaluated as no potential generic concern because the absence of a cable in a tray via would make the thermal analysis more conservative. These cases are identified in the table of Attachment 3 under the subheading "Covered by Analysis."

2. Five cables were misinstalled in that installation to turn from one raceway section into another, resulting in a small length of the cable protruding into the adjacent raceway section. These were determined to constitute no potential generic concern because project engineering's method for determining which trays are to be wrapped will include the requirement for wrapping a portion of the adjacent trays. These cables are listed in the table of Attachment 3 under the subheading "Wrapping Criteria."

3. Eight cables involved airlining (limited routing of cable without using raceway) at the motor control center (MCC). Although these cables did not conform to the detailed routing in 7220-E-37, they did conform to the design criteria in 7220-E-42, Sheet 5, which gives

notes and defines the proper use of 7220-E-37. Because 7220-E-42 takes precedence over 7220-E-37, these cases were determined to constitute no potential generic concern. These cases are listed in the table of Attachment 3 under the subheading "Airlining at MCCs."

4. Four cables were determined to constitute no potential generic concern because, although the cable was pulled, additional construction processes and inspections already planned at the time of the overinspection would have identified these conditions. These cases are listed in the table of Attachment 3 under the subheading "Construction Incomplete."

   Two of these four cases were related to cables which had been neither final trained in accordance with Procedure FPE-4.000 nor inspected in accordance with PQCI E-3.0.

   Two cases involved cables that could not be terminated. One cable entered the wrong compartment of a control panel and the other was pulled to the incorrect penetration.

   In each of the four cases above, the subsequent construction activities could not have been accomplished and construction would have corrected the conditions.

5. Sixteen cables had nonconformances directly related to extensive successive rework. This was determined to be a unique case and not repeatable, and thus not a potential generic concern. For more details on this case, refer to Sketch 25 of Attachment 3. A second unique case involves a cable being tied to the bottom rung of a riser. We are unaware of this situation ever occurring elsewhere in the plant. These cases are listed in the table of Attachment 3 under the subheading "Unique Case."

6. None of the misinstalled cables were evaluated to be a source of potential generic concern relative to 10CFR, Appendix R (fire protection) because of the wrapping design of the trays. Whenever any two Class 1E trays (of different channels) are within 20 feet of each other, one tray will be wrapped. Therefore, a misinstalled cable would be located in another 1E tray of the same channel already evaluated for fire protection and it would be wrapped, if required. A subheading is given for this condition in the table of Attachment 3, but none of the specific 55 cases exhibited this condition.

7. Channel separation, in accordance with Regulatory Guide 1.75, was determined not to be a potential generic concern because the design is based on cable tray spacing. When trays from different channels are determined to be less than the required distance apart, one tray will be wrapped to provide an adequate barrier. Therefore, a misinstalled cable located in another tray of the same channel will be adequately separated (or protected) from trays of other channels. A subheading is given for this condition in the table of Attachment 3, but none of the specific 55 cases exhibited this condition.

   It should be noted that, of the 1,084 cables subject to overinspection, no cases of channel mixing due to misinstalled cables were detected. This is because 1E cables are color-coded, which makes this type of error apparent and it would thus be detected and corrected by construction or QC.

The remaining 17 of the 55 cables represented a potential generic concern for which further actions are required as described in Section III of this report.

III. CASES OF POTENTIAL GENERIC CONCERN - FURTHER ACTION NEEDED

Section III identifies the types of cases that are evaluated to be of potential generic concern, and therefore warranting further action. This section is written in two parts - the first part dealing with potential voltage violations and the second part dealing with potential adverse thermal effects.

1. Six cables were installed into incorrect trays at transition points. If repeated elsewhere, this could result in a voltage violation, mixing power and instrument cable. Thus, this is of potential generic concern for which further action is required to remove the concern.

   QC will add to the area walkdown inspection procedure (PQCI 7220-E-3.0), a requirement to inspect all cable transitions from raceways to ensure that no voltage violations occur. Therefore, this type of misinstallation will be corrected or subject to Project Engineering evaluation on a case-by-case basis. These cases are identified in the table of Attachment 3 under the subheading "QC Area Walkdown."

2. The remaining 11 cables also represented a potential generic concern of derating of cables due to thermal effects for which further actions are required to remove the concern. The conditions represented by these cables might result in nonconservative thermal analysis for trays that are subject to wrapping (for fire protection according to 10CFR, Appendix R, or channel separation according to Regulatory Guide 1.75) or have tray fill greater than 30% by volume (FSAR Table 8.3-44). Thirty percent tray fill is considered to be a conservative level for initiating analysis and is the most widely accepted value in the industry.

According to FSAR Appendix 9A, a 20-foot horizontal separation is required between redundant safe shutdown cables. According to Regulatory Guide 1.75, a 3-foot horizontal and a 5-foot vertical separation are also required. Raceway (cable tray) is wrapped when the configuration does not meet these separation requirements.

In reviewing raceway drawings, a subject raceway is picked and reviewed in every direction to determine if another Class 1E raceway of a different channel does not meet the separation requirements. The process is repeated throughout the length of the raceway. When two sections of raceway are found to be less than the required distance apart, both raceways will be analyzed for thermal effects, and the tray with the lower energy level (wattage per square foot) will be identified for wrapping (in Drawing Series E-2500 and E-2600).

The thermal analysis is based on the cables designed to be in a given tray (in accordance with Raceway Schedule 7220-E-36). To acquire an additional level of confidence that wrapped trays or overfilled raceways will not be degraded, the number of power cables that have the potential for being misinstalled in a pull will be determined. This information will be used to identify cable tray sections which may be analyzed considering the potential for misinstallation. This added step will identify tray sections that require verification because of potential thermal derating of the cables. Therefore, when a tray is to be wrapped, it must be verified that the cables designed to be in that tray are present. This verification will be accomplished by inspecting identified tray sections to confirm that the population of cables in each specific tray section is the same quantity and size as established by Drawing 7220-E-36.

When a raceway is determined by verification to have a population different from that specified in Drawing 7220-E-36, additional inspections will be performed to identify the specifics of the population variance. The specifics will be referred to project engineering for evaluation and disposition.

These 11 cases are listed in the table of Attachment 3 under the subheading "Thermal Analysis."

IV. ACTION PLANS

The following is a list of the specific actions which are to be taken, with the organization primarily responsible for the action and the action completion date given parenthetically:

1. Revise PQCI E-3.0 to add a QC area walkdown inspection to verify that no cable transitions result in voltage violations (QC, complete).

2. Submit the revised PQCI E-3.0 to MPQAD for review and approval and through MPQAD to NRC for review (QC, complete/MPQAD, June 14, 1982).

3. Establish the method of thermal analysis by which to identify the cable trays to be inspected by QC (Project Engineering, 6/11/82).

4. Perform the thermal analysis to identify the cable trays to be inspected by QC (Project Engineering, 7/1/82 through 12/31/82).

5. Issue the drawing (or revisions) which identifies cable trays to be inspected by QC (Project Engineering, 12/31/82).

6. Prepare the PQCI for the inspections to be made per drawing in Item 5 and for trays to be wrapped per E-2500 and E-2600 (QC, 2 weeks after the completion of item 5).

7. Submit the PQCI to MPQAD for approval and through MPQAD to NRC for review (QC, 1 day later/MPQAD, 2 weeks later).

8. Issue the PQCI for implementation (QC, 2 days after MPQAD approval).

9. Schedule and conduct training to the PQCI per Paragraph 8.5 of PSP G-6.1. Notify MPQAD prior to the training so they may attend. (QC, 2 days after MPQAD date in item 7).

10. After training has been documented as required by Paragraph 8.5 of PSP G-8.1, notify MPQAD, who, in turn, will notify the NRC. (QC, 2 days after the completion of training/MPQAD, 1 week thereafter).

11. Perform the inspections per the PQCI in Item 6 above (QC, per construction schedule).

12. Issue the MPQAD plan for the overinspection of the inspections being performed by QC (MPQAD, 2 weeks after MPQAD approval of the PQCI per item 7).

13. Perform the overinspections (MPQAD, per construction schedule).

14. In accordance with the existing procedures, prepare the FSAR revision (Project ENgineering, FSAR Review Schedule).

15. Begin the overinspection of the remainder of the cable installations previously inspected by QC Engineer #1 (MPQAD & QC, June 7, 1982).

V. CONCLUSIONS

Based on the foregoing, the following conclusions are drawn.

1. The misinstallations detected by the overinspection are minor departures from design criteria, usually one incorrect via on a cable routing. None of the specific 55 misinstalled cables had any adverse impact on safety.

2. The generic implications of the misinstalled cables were evaluated. Either there was no generic concern for the majority of cases or the generic concern is being resolved by the additional actions, and thus has no adverse impact on safety.

VI. MEETING MINUTES

A meeting was held on May 14, 1982, in Glen Ellyn, Illinois, between Consumers Power Company, Bechtel, and the NRC, to discuss this report on cable installation. Meeting attendees are listed in Attachment 4.

The results of the meeting were that the NRC, in general, favored our approach. However, certain additional conditions must be met for the approach to be officially accepted. The conditions were as follows.

1. That, in addition to the 43% of inspections made previously, the remaining 57% of the cable installations originally inspected by Bechtel QC Engineer #1, be reinspected. (Subsequent to the meeting, on May 17, 1982, B.W. Marguglio advised C. Norelius that this reinspection would be made.)

2. That the NRC review PQCI E-3.0, which will be revised to reflect the inspection of all cable transitions from raceways to ensure that no voltage violations occur

3. That the NRC review the approach to be used for the thermal analysis to identify raceways, by type, that will be subject to QC inspection for cable count

4. That the FSAR be revised to be consistent with other construction activities

5. That the NRC review the PQCI for inspection of the cables in selected raceways

6. That the Nuclear Reactor Regulation (NRR) review this entire matter

7. That Consumers Power Company provide the specific schedule for each action given in the action plan of Section IV

TABLE 2 - CABLE TERMINATION CHARACTERISTICS

Type of Characteristic	Number of Each Type of Characteristic
Cable scheme number identification	1
Cable type identification	1
Cable code identification	1
Cable reel number	1
Cable minimum bend radius	1
Cable permanent identification tag	1
Lug integrity	1
Termination integrity	1
Crimp integrity	1
-ect termination per wiring diagram	1
Shield and drain wires	1
Insulation	12
TOTAL	

TABLE 1 - CHARACTERISTICS ASSOCIATED WITH CABLE PULL

Type of Characteristic	Number of Each Type of Characteristic
Cable jacket color band	1
Cable jacket color stripe	1
Cable identification tagging at each end	2
Cable reel number	1
Minimum cable bend radius[a]	1[a]
Cable vias[b]	15[b]
Cable ties[a]	1[a]
Cable tray damage	1
Cable damage	1
TOTAL	24

(a) There are multiple points at which the cables are bent or at which the cables are tied but, in the interest of conservation, these are each counted as one characteristic.

(b) For each cable pull, it is estimated that there is an average of 15 vias. This is considered to be a conservative estimate, although it was not arrived at by an actual count of the vias for each of the jobs overinspected.

Disposition

A. Of the 157 individual nonconforming characteristics, 145 were dispositioned by Bechtel Project Engineering to be "used as is." The basis for this disposition for the cable routing nonconformances is that they have no impact on separation, segregation, physical loading and thermal loading and, therefore, no impact, whatsoever, on plant safety. The disposition of these cable routing nonconformances also calls for the drawings to be changed to reflect the "as built" conditions.

B. Twelve characteristics were dispositioned to be "reworked." Ten of these were for cable pulls involving ten different cables. The other two were for cable terminations. In each of these cases, Bechtel Project Engineering stated that there was no public safety impact, ie, that these nonconformances could not have caused an accident or impeded the ability to ameliorate the consequences of an accident. As a matter of fact, in the opinion of Bechtel Project Engineering, it was doubtful that any of these nonconformances would have impaired the functionability of the circuits involved. Attachment A provides the specifics of the Bechtel Project Engineering disposition and the jurisdiction for that disposition.

VII. Conclusions

On the basis of the above information, the undersigned believe that the Bechtel certification process for the nine Bechtel Quality Control Engineers was adequate. In the interest of further improvement, on-the-job training is now being documented and MPQAD, on a sampling basis, is overviewing the Bechtel Quality Control Engineer certification process. However, in each case for which the ANSI N45.2.6-1973 education and experience criteria are not met, MPQAD is now overviewing the Bechtel certifications.

M J Schaeffer, Section Head
Electrical/I&C, MPQAD

3/26/82
Date

E L Jonas, Group Supervisor
Electrical/I&C, MPQAD

3/26/82
Date

071298

C. Therefore, a total of 26,016 cable pull characteristics were overinspected (24 x 1,084).

D. There were 91 nonconforming via characteristics and 66 nonconforming recordings of cable reel numbers, for a total of 157 nonconforming characteristics. Therefore, 0.60 percent (157 ÷ 26,016) of the cable pull characteristics were nonconforming.

E. There were 55 misrouted individual cables in 1 or more vias, resulting in 5.07 percent (55 ÷ 1,084) of the cables being misrouted at 1 or more points.

III. Cable Terminations

A. For each cable termination, 12 characteristics were overinspected, as enumerated in Table 2 (attached).

B. MPQAD overinspected 282 cable terminations.

C. Therefore, a total of 3,384 characteristics (12 x 282) were overinspected.

D. There were 2 nonconforming characteristics, or 0.06 percent (2 ÷ 3,384).

E. Each of the termination nonconformances was on a different cable. Therefore, 0.71 percent (2 ÷ 282) of the terminations was nonconforming with regard to 1 characteristic.

IV. Cable Tray Supports

For each of the 2 cable tray support overinspections, there are 8 inspection characteristics, resulting in the overinspection of 16 characteristics. There were no nonconformances.

V. Totals

For all jobs overinspected, there were 159 individual nonconforming characteristics, from a total of 29,416 individual characteristics. Therefore, 0.54 percent (159 ÷ 29,416) of the characteristics were nonconforming.

Attachment 1 to
Report on Cable Installation

RESULTS OF THE SPECIAL ELECTRICAL OVERINSPECTION REQUESTED BY NRC

I. Introduction

A. NRC requested that MPQAD perform special overinspections of the inspections made by 4 Bechtel Electrical Quality Control Engineers whose certifications were questioned by NRC because of the amount of training which was documented in their certification files.

B. NRC requested also that MPQAD perform special overinspections of the inspections made by any other Bechtel Electrical Quality Control Engineers whose original inspections were impacted by any then existing Nonconformance Reports originated by MPQAD. This resulted in the identification of 5 additional Bechtel Electrical Quality Control Engineers whose inspections were to be subject to the MPQAD special overinspection.

C. In a telephone conversation with Mr William Little of the NRC, it was agreed that 250 of these overinspections could be accomplished by Bechtel Electrical Quality Control Engineers, other than the 9 Engineers whose work was subject to this special overinspection.

D. MPQAD performed overinspections of 1,118 original inspections for cable pulls, cable terminations and cable tray supports. Each of these original inspections was documented on a Bechtel Quality Control Inspection Report (QCIR).

E. Bechtel Quality Control overinspected 250 cable pulls which were originally inspected by one Engineer. Each of these original inspections also was documented on a QCIR.

F. Therefore, 1,368 original inspections were overinspected by either MPQAD or Bechtel Quality Control.

II. Cable Pulls

A. For each cable pull, 24 characteristics were overinspected by either MPQAD or Bechtel Quality Control. These characteristics are enumerated in Table 1 (attached).

B. MPQAD overinspected 834 cable pulls and Bechtel Quality Control overinspected 250 cable pulls, for a total of 1,084.

Attachment 1 to
Report on Cable Installation

71298

TO: Distribution

FROM: MJSchaeffer, MPQAD

DATE: March 24, 1982

SUBJECT: [redacted]

File 10.0

Enclosed is the revised report on the results of the Special Electrical Overinspection requested by the NRC to support their testimony as to the adequacy of the certification/qualification process of Bechtel Electrical Quality Control Inspectors.

This report was revised to reflect that a total of 55 cables were misrouted, in lieu of 61, which was originally reported on the now superseded report dated February 25, 1982.

Distribution: WRBird, P14-418A
JWCook, P26-336B
RCook, NRC Inspector on Site
PCorcoran, Bechtel-Midland
MLCurland, Midland
LHCurtis, Bechtel-Ann Arbor
LEDavis, Bechtel-Midland
MADietrich, Bechtel-Midland
RGardner, NRC Region III
BWMarguglio, Midland
DBMiller, Midland
JARutgers, Bechtel-Ann Arbor
ESmith, Bechtel-Midland

Attachment 2 to
Report on Cable Installation

Consumers Power Company
BAY-0

NONCONFORMANCE REPORT

B. ECTS. ENGINEERING AND CONSTRUCTION - QUALITY ASSURANCE DEPARTMENT

SUS: OGLH Trend: B-3, (B-5) (1-3) (1-5) Priority: 5 AI: S-1270 PAGE 1 OF 2

PROJECT NAME: Midland 1 and 2	7. NONCONFORMING PART NO: CAb 4511 H	8. NONCONFORMING PART NAME: Electrical Cables	1. NCR SERIAL NO: MJT-9-2-013
			2. DATE: 2/3/82 CLOSED 4/16/82
SERIAL NUMBER: N/A	9. ORG. CONSULTING NC: Bechtel Construction/ Bechtel Quality Control	11. AREA/LOC. OF NC: Lower Cable Spreading Room	3. DATE OF REV: N/A
			4. FILE NO: 16.0 KFH

"AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

Bechtel Electrical Circuit Schedule Drawing E-37, Revision 52, Run 07 gives the first five vias for routing cable scheme CAB 4511 H as: AWW024, AFB07, AFB08, AFB09 and AFA09. Bechtel PQCI 7220/E-4.0 gives identical routing requirements.

Contrary to the above requirements, actual cable routing of this cable for the first seven vias is AWW024, AFC06, AFC07, AFC08, AFC09, AFA10, AFA09

5. DISTRIBUTION
ACTION COPY:
LHCurtis
LEDavis
ESmith

INFO COPY:
WRBird JLWood
JWCook DANott
MADietrich ALAB-2
BWMarguglio MJSchaeffer
REMcCue, ~~GPolizin~~ BHPeck
DBMiller RDJohnson
~~BHPeck~~ MLCurland
JARutgers
DATaggart
~~DMTurnbull~~
RAWells

QA RECOMMENDATION FOR PART CA:
Bechtel Engineering evaluate routing of cable CAB 4511 H. Take appropriate action to make E-37 and routing of cable agree. (LHCurtis)

PROJECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ]

HOLD TAG APPLIED? YES [ ] NO [X] NUMBER, LOCATION & TYPE OF HOLD TAGS APPLIED:

IS PROCESS CA REQUIRED: YES [X] NO [ ] IF NO, ENTER JUSTIFICATION BELOW:

DOES NC AFFECT Q-LIST ITEM: YES [X] NO [ ]	17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]
IS NC REPORTABLE PER PART 21: YES [ ] NO [X]	19. IF YES, DATE & TIME OF REPORT TO NRC: N/A
IF YES, WHO MADE REPORT TO NRC: N/A	21. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: N/A

NCR ORIGINATED BY: D.A. Nott 2/3/82	23. WRITTEN REPLY REQUIRED BY: 2/24/82 TO ESTABLISH CA COMPLETION DATE	24. SUPERVISOR'S SIGNATURE/DATE: M 9. Schneider 2/3/82

PART CA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

Curtis response dated 2/23/82 attached.

26. DESIGN/PROJECT SIG. AUTH. DISP.: See Block 25	27. PMO SIG. AUTH. DISP.: N/A	28. PROCUREMENT SIG. CONC. DISP.: N/A	29. SIG. OF ORG. RESP. FOR C/A: See Block 25
30. QA SIG. AUTH. DEP. DISP.: See Block 25	31. SIG. OF TEST GROUP ACTION. CONCURRENCE: N/A	32. FOR MAJOR MOD - PLT. SUPT. SIG. AUTH. DISP.: N/A	33. QA AUTH. SIG. TO DOCUMENT DISP.:

METHOD OF PART CA VERIFICATION:

Verified DCN-884 and latest Revision of Drawing E-37 reflect the as pulled vias of Cable 4511H.

Attachment 2 to
Report on Cable Installation

To: B. W. Marguglio

Consumers Power Company

NONCONFORMANCE REPORT

From: L. H. Curtis

SUS: 71298 OGLN Trend: B-3, (B-5) (1-3) (1-3) Priority: 5 AI: S-1270 PAGE 1 OF 2

...NT NAME:	7. NONCONFORMING PART NO:	8. NONCONFORMING PART NAME:	1. NCR SERIAL NO: M01-9-2-013
...land 1 and 2	OAB 4511 H	Electrical Cables	2. DATE: 2/3/82
...AL NUMBER: N/A	10. ORG. COMMITTING ...: Bechtel Construction/ Bechtel Quality Control	11. AREA/LOC. OF NC: Lower Cable Spreading Room	3. DATE OF REV: N/A
			4. FILE NO: 16.0

1... NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

...tel Electrical Circuit Schedule Drawing E-37, Revision 82. Run ... gives the first five vias for routing cable scheme OAB 4511 H as: ...24, AFB07, AFB08, AFB09 and AFA09. Bechtel PQCI 7220/E-4.0 gives ...tical routing requirements.

...rary to the above requirements, actual cable routing of this ...e for the first seven vias is AWW024, AFC06, AFC07, AFC08, ...9, AFA10, AFA09

5. DISTRIBUTION
ACTION COPY:
LHCurtis
LEDavis
ESmith

INFO COPY:
WRBird JLWood
JWCook DANott
MADietrich ALAB-2
BWMarguglio
REMcCue/CFollin
DBMiller
BHPeck
JARutgers
DATaggart
DMTurnbull
RAWells

...COMMENDATION FOR PART CA:
...tel Engineering evaluate routing of cable OAB 4511 H. Take ...opriate action to make E-37 and routing of cable agree. (LHCurtis)

...ECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ]

... TAGS APPLIED: YES [ ] NO [X] NUMBER, LOCATION & TYPE OF HOLD TAGS APPLIED:

...PROCESS CA REQUIRED: YES [X] NO [ ] IF NO, ENTER JUSTIFICATION BELOW:

... NC AFFECT Q-LIST ITEMS: YES [X] NO [ ]	17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]
...NC REPORTABLE PER PART 21: YES [ ] NO [X]	19. IF YES, DATE & TIME OF REPORT TO NRC: N/A
...YES, WHO MADE REPORT TO NRC: N/A	21. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: N/A

...ORIGINATED BY:	23. WRITTEN REPLY REQUIRED BY:	24. SUPERVISOR'S SIGNATURE/DATE:
D. Nott 2/3/82	2/24/82 TO ESTABLISH CA COMPLETION DATE	M. G. Schuessler 2/3/82

... CA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

...is is Project Engineering's complete response. The actual 'as built' routing for cable ...B4511H has been evaluated and is acceptable as is. DCN number 884 to E-37 has been issued .../12/82) to reflect the 'as built' route.

...: D. Borlaza P. Corcoran
D. Hollar G. Warner
L. Curtis

ACTION PRINT	DAN
INFO PRINTS	
MPQA ROUTING	DATE
PRINT TO FILE	
ORIG TO FILE	16.0

...ENG/PROJECT SIG. AUTH. DISP.:	27. PMO SIG. AUTH. DISP.:	28. PROCUREMENT SIG. CONC. DISP.:	29. SIG. OF ORG. RESP. FOR C/A:
P. Corcoran for L. Curtis 3/1/82	N/A	N/A	P. Corcoran for L. Curtis

.../CONST. SIG. AUTH. ENG. DISP.:	31. SIG. OF TEST GROUP ACKNOW. CONDITIONS:	32. FOR MAJOR MOD - PLT. SUPT. SIG. AUTH. DISP.:	33. QA AUTH. SIG. TO IMPLEMENT
	N/A	N/A	

...OD OF PART CA VERIFICATION:

Consumers Company

NONCONFORMANCE REPORT
PROCESS CORRECTIVE ACTION

PROJECT ENGINEERING AND CONSTRUCTION
QUALITY ASSURANCE DEPARTMENT
M01-9-7

ET OF ROOT CAUSE(S):

C71298

Bechtel Construction did not follow correct routing for cable scheme CAB 4511 H.
QC Engineer did not verify correct routing of the cable.

IAL ROOT CAUSE(S), IF DIFFERENT FROM ABOVE (TO BE COMPLETED BY ORG. RESPONSIBLE FOR PROCESS CA):

ESS CA RESULTED FROM:

TION ☐ FABRICATION ☐ CONSTRUCTION ☒ PROCUREMENT ☐ INSPECTION ☒

ER

RECOMMENDATION FOR PROCESS CA:

(1) Determine if there were other cables in this pull which may not be routed other than as specified by E-37. Inform MPQAD of results. (LEDavis)

(2) Review PQCI E-4.0, "Installation of Electrical Cables" with cable pulling QCEs, emphasis to be placed on Activity 2.5. Inform MPQAD when action is complete. (ESmith)

ESS CA TO BE TAKEN BY ORG(S) CHECKED IN BLOCK #1 & DATE OF COMPLETION:

ESS OF PROCESS CA VERIFICATION:

Attachment 2 to Report on Cable Installation

B 7220 MIDLAND PROJECT

BECHTEL POWER CORP.

TRANSMITTAL FORM

№ 20275

PLEASE RECEIPT AND RETURN BLUE COPY IMMEDIATELY

071298

DATE 4/12/82

* ACTION

ACTION FOR VENDORS	ACTION FOR OTHERS
1. ☐ APPROVED - MFG. MAY PROCEED	6. ☐ FOR APPROVAL
2. ☐ APPROVED SUBMIT FINAL DWG. MFG. MAY PROCEED	7. ☐ CONSTRUCTION
3. ☐ APPROVED EXCEPT AS NOTED. MAKE CHANGES AND SUBMIT FINAL DWG. MFG MAY PROCEED AS APPROVED	8. ☐ PRELIMINARY USE
4. ☐ NOT APPROVED. CORRECT AND RESUBMIT	9. ☐ REFERENCE
5. ☐ REVIEW NOT REQUIRED MFG. MAY PROCEED.	10. ☒ Complete response

SUBJECT	CODE
☐ BECHTEL DRAWINGS	B
☐ VENDOR DRAWINGS	V
☐ MATERIAL REQUISITION	MR
☐ SPECIFICATIONS	S
☐ BID REQUEST	BR
☐ QUOTATIONS	Q
☐ PURCHASE ORDER	PO
☐ CONFERENCE NOTES	CN
☐ BID SUMMARY	BS
☐ SUBCONTRACTS	SC
☐ _____	X
☐ _____	Y

NTION VENDORS: ALL FINAL DRAWINGS SUBMITTED TO BECHTEL MUST BE CERTIFIED TRANSPARENCIES.

P.P. PREFIX	BECHTEL FOREIGN PL. NO. ☐ BECHTEL DRAWING NO. ☐	REV. NO.	TITLE	VENDOR NO.	ACTION	CODE
			MPQAD NCR M-01-9-2-013 QA AI S-1270 QC AI 1503			

CONSUMERS POWER COMPANY

RECEIVED

APR 14 1982

FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

MENTS: cc: W. R. Bird
B. W. Marguglio

ACTION PRINT	DAN
INFO PRINTS	
[illegible] ROUTING	MLC
[illegible] TO FILE	
[illegible] TO FILE	16.0

THIS COPY FOR

FROM

D. M. Turnbull, MPQAD
Consumers Power Company

ESmith, Quality Control
Bechtel Power Corp.

☐ VENDOR PRINT
☐ OTHER

BY E.S. E. Smith

T1238

QC AI 1503

MPQAD NCR M-01-9-2-013

A review of PQCI E-4.0 Rev. 9, "Installation of Electrical Cables" with cable pulling QCE's was performed on 3/12/82. Special emphasis was placed on activity 2.5, verification of correct vias.

T/N 20275

Attachment 2 to Report on Cable Installation

JOB 7220 MIDLAND PROJECT

BECHTEL POWER CORP.

TRANSMITTAL FORM

Nº 22997

PLEASE RECEIPT AND RETU[illegible] BLUE COPY IMMEDIATELY

DATE February 17, 1[illegible]

* ACTION

ACTION FOR VENDORS	ACTION FOR OTHERS
1. ☐ APPROVED - MFG. MAY PROCEED	6. ☐ FOR APPROVAL
2. ☐ APPROVED SUBMIT FINAL DWG. MFG. MAY PROCEED	7. ☐ CONSTRUCTION
3. ☐ APPROVED EXCEPT AS NOTED. MAKE CHANGES AND SUBMIT FINAL DWG. MFG MAY PROCEED AS APPROVED	8. ☐ PRELIMINARY USE
4. ☐ NOT APPROVED. CORRECT AND RESUBMIT	9. ☐ REFERENCE
5. ☐ REVIEW NOT REQUIRED MFG. MAY PROCEED.	10. ☒ complete response

SUBJECT	CODE
☐ BECHTEL DRAWINGS	B
☐ VENDOR DRAWINGS	V
☐ MATERIAL REQUISITION	MR
☐ SPECIFICATIONS	S
☐ BID REQUEST	BR
☐ QUOTATIONS	Q
☐ PURCHASE ORDER	PO
☐ CONFERENCE NOTES	CN
☐ BID SUMMARY	BS
☐ SUBCONTRACTS	SC
☐ _____	X
☐ _____	Y

ATTENTION VENDORS: ALL FINAL DRAWINGS SUBMITTED TO BECHTEL MUST BE CERTIFIED TRANSPARENCIES.

Y.	P. P. PREFIX	BECHTEL FOREIGN PE. NO. ☐ BECHTEL DRAWING NO. ☐	REV. NO.	TITLE	VENDOR NO.	* ACTION	CODE
				NCR M-01-9-2-013 A.I. S-1270			

[illegible] COMPANY

RECEIVED

FEB 19 1982

FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

ACTION PRINT	DAN
INFO PRINTS	BWM / ELJ / MTS
MAIL ROUTING	DAT
PRINT TO FILE	
ORIG TO FILE	16.0

COMMENTS: _____

THIS COPY FOR

B.W. Marguglio
Jackson - CPCo
: W.R. Bird
D.M. Turnbull

FROM

L.E. Davis
Midland Jobsite

☐ VENDOR PRINT

BY [signature]

71298

NCR M-01-9-2-013 A.I. S-1270

A complete review of all cables in the A-276 pull package revealed 1AA-0503M and 1AA-504L were also incorrectly routed. The actual routing was determined to be acceptable. FCN 6388 has been written to correct E-37 to the "as built" condition.

Attachment 2 to Report on Cable Installation

To: B. W. Marguglio

From: L. H. Curtis

NONCONFORMANCE REPORT

Company

Priority: 1 Start Up: CD-88 Trend: I-3, (I-5) AI: S-1273 PAGE 1 OF 5

Land 1 & 2	See below	Electrical Cables	2/11/82
N/A	Bechtel Construction/ QC/Project Engineering	Various Class 1E Locations	N/A
			16.0

MJI-9-2-016

MPQAD overinspections have determined that the actual routing of the listed cables does not conform to the required routing.

The "AS IS" condition of cable routing and the "AS REQUIRED" cable routing, taken from Electrical Circuit Schedule E-37, Rev 52, are listed adjacent to the cable scheme numbers and routing inconsistancies underlined.
The "AS IS" condition of cable routing does not also conform to the "AS REQUIRED" routing referenced in Bechtel PQCI 7220/E-4.0, which was used by Bechtel for inspection and acceptance of cables. The cable routing given by E-37, Rev 52, is identical to that referenced by PQCI/E-4.0 for each of the listed cables.

ACTION COPY:
LHCurtis/PCorcoran
LEDavis
ESmith

INFO COPY:
WRBird DMTurnbull
JWCook RAWells
MLCurland JLWood
MADietrich ALAB-2
RDJohnson MJSchaeffer
BWMarguglio
REMcCue
DBMiller
EHPeck
JARutgers
DATaggart

Bechtel Engineering is requested to evaluate the impact of the "AS IS" cable routing to determine acceptability and advise Bechtel Construction accordingly.(LHCurtis)

(Continued on page 5)

A/PROJECT ENG. DISPOSITION REQUIRED [X] NOT REQUIRED [ ]

TRAIN AFFECTED: [ ] NO [X]

HOLDER, LOCATION & TYPE OF HOLD TAGS APPLIED:

NCRER CA INITIATED: YES [X] NO [ ] IF NO, ENTER JUSTIFICATION BELOW:

NC AFFECT O-LIST ITEM: YES [X] NO [ ]	17. IS NC REPORTABLE PER 50.55(e): YES [ ] NO [X]
REPORTABLE PER PART 21: YES [ ] NO [X]	18. IF YES; DATE & TIME OF REPORT TO NRC: N/A
1, AND MADE REPORT TO NRC: N/A	19. IF YES, NAME OF NRC OFFICIAL TO WHOM REPORTED: N/A

ATTACHED BY: M. J. Schaeffer J Schaeffer	23. WRITTEN REPLY REQUIRED BY: TO ESTABLISH CA COMPLETION DATE 2/15/82	24. SUPERVISOR'S SIGNATURE/DATE: M. J. Schaeffer 2/11/82

CA DISPOSITION, JUSTIFICATION & COMPLETION DATE:

See attached for Project Engineering's response.

ACTION PRINT	MTS
INFO PRINTS	
MPQA ROUTING	DMT
PRINT TO FILE	
ORIG TO FILE	16.07

cc: D. Borlaza P. Corcoran
D. Hollar G. Werner
L. Curtis

THIS COPY FOR

25. PROJ SIG. AUTH. REP.: P. Corcoran for L. Curtis 2/12/82	27. PMO SIG. AUTH. REP.: N/A	28. PROCUREMENT SIG. CONC. REP.: N/A	29. SIG. OF ORG. RESP. FOR CA: P. Corcoran for L. Curtis 2/12
30. CONST. SIG. AUTH. DEP. REP.:	31. SIG. OF TEST GROUP ACTION. CONCURRENCE: N/A	32. FOR NAUTH NCR - FAIL. SUPT. SIG. AUTH. REP.: N/A	33. QA AUTH. SIG. TO IMPLEMENT:

OF FINAL CA VERIFICATION:

Attachment 2 to Report on Cable Installation

Consumers Power Company

PROJECTS, ENGINEERING AND CONSTRUC.
ALITY ASSURANCE DEPARTMENT

NONCONFORMANCE REPORT
PROCESS CORRECTIVE ACTION

M-01-9-2-016

NCR SERIAL NUMBER:

ENT OF ROOT CAUSE(S):

Bechtel Construction and QC in conjunction with Project Engineering to determine the root cause and inform MPQAD. (LEDavis & ESmith)

TIAL ROOT CAUSE(S), IF DIFFERENT FROM ABOVE (TO BE COMPLETED BY ORG. RESPONSIBLE FOR PROCESS CA):

CESS CA ACQUIRED FROM:

ION ☐ FABRICATION ☐ CONSTRUCTION ☒ PROCUREMENT ☐ INSPECTION ☒

ER

MMENDATION FOR PROCESS CA:

rmaine the need for additional Process Corrective Action in view of the fact that AD NCR M-01-9-2-013, dated 2/3/82, addressed a similar problem. Inform MPQAD of the decision and action taken to preclude reoccurrence of the cable routing discrepancies. (LEDavis & ESmith)

CESS CA TO BE TAKEN BY ORG(S) CHECKED IN BLOCK #4 & DATE OF COMPLETION:

TION OF PROCESS CA VERIFICATION:

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
CAB6501M	AS REQUIRED ROUTING: ASL135, AJB041, AJB02, AJB01, AJB025, AAC27, AMH006, AAC63, AJ1059, ASA027, ASA09, ASA08, ASA07, ASA06, ASA05, ASA04, ASA03, ASA014 and ASL968. AS IS ROUTING: ASL135, AJB041, AJB02, AJB01, AJB025, AAC27, AMH006, AAC63, AJ1059, ASA027, ASA08, ASA07, ASA06, ASA05, ASA04, ASA03, ASA014 and ASL968.
2AB6302K	AS REQUIRED ROUTING: AKA054, AKA04, AKA03, AKA02, AKF01, AJF02, AJF01, AFD01, AFD02, AFD03, AFD04, AFD05, AFD06, AFV07, AFV08, AFU99, AFA09, AFD09 and ASL921 (Per DCN 657). AS IS ROUTING: AKA054, AKA04 KA02, AKA01, AJF01, AFD01, AFD02, AFD03, D05, AFD06, AFV07, AFV08, AFU99, AFA09, d ASL921.
CAB6502M	AS REQUIRED ROUT. : ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, AJF02, AKF01, AKA02, AKA03, AKA04 and AKA054. AS IS ROUTING: ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, AKA01, AKA02, AKA03, AKA04 and AKA054.
CBY3614A	AS REQUIRED ROUTING: BSL936, BDB01, BDA02, BDA01, BJ419, BA032, BJ524, BJA073, BJA05, BJA04, BJA03 and BJA035. AS IS ROUTING BSL938, BDB01, BDA02, BDA01, BJ419, BA032, BJ524, BJA073, BJA05, BJA04, BJA03 and BJA035.

"AS IS" NONCONFORMING CONDITIONS VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
1AB5301K	AS REQUIRED ROUTING: ASL944, ADB01, ADA02, ADA01, AJ424, AAC33, AFK01, AJL01, AFE01, AFF01, AFF02, AFB01, AFB02, AFB03, AFB04, AFB05, AFB06, AFB07, AFB08, AFB09, AFA09, AFA08, AFA07, AFA06, AFA05, AFA04, AFA03, AFA02, AFA01, AFL01, AFL03, AFL10, AJS07, ASL935. AS IS ROUTING: ASL945, ADB01, ADA02, ADA01, AJ424, AAC33, AFK01, AJL01, AFE01, AFF01, AFF02, AFB01, AFB02, AFB03, AFB04, AFB05, AFB06, AFB07, AFB08, AFB09, AFA09, AFA08, AFA07, AFA06, AFA05, AFA04, AFA03, AFA02, AFA01, AFL01, AFL03, AFL10, AJS07 and ASL935.
1DQ157A	AS REQUIRED ROUTING: DTB005, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC003, DTA002, DTA21, DTA22. AS IS ROUTING: DTB005, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DFA08, DJA07, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DJA01, DC002, DTA003, DTA21, DTA22.
1DQ396D 1DQ396F 1DQ396H 1DQ396L 1DQ396T	AS REQUIRED ROUTING: DTB004, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA01, DC003, DTA002, DTA21, DTA22. AS IS ROUTING: DTB004, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DFA08, DJA07, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DJA01, DC002, DTA003, DTA21, DTA22.
1DQ177E	AS REQUIRED ROUTING: DSL907, DGA01, DWW001, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC003, DTA002, DTA21. AS IS ROUTING: Coil, DTB03, DFA08, DJA07, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DJA01, DC002, DTA003, DTA21.

7126

13. QA RECOMMENDATION FOR PART CORRECTIVE ACTION: (Continued from page 1)

B)

1. Bechtel Construction is requested to comply with the E-37 Rev 52, or direction from Project Engineering par (A) above. (LEDavis)

2. Bechtel QC is requested to update the applicable QCIRs to reflect the nonconforming condition identified. (ESmith)

IR M-01-9-2-016
AI: E-1273
Attachment

This is Project Engineering's complete response:

CABLE SCHEME NUMBER	EVALUATION
0AB6501N 2AB6302K 0AB6502M 1AB5301K	'As built' routes as stated are acceptable. Use as is: E-37 revised, reference DCN number 884 (2/12/82).
0BY3614A	'As built' via BSL938 is stated incorrectly on NCR. 'As built' via (verified by Resident Engineering) is BSL937. This via is acceptable as is. E-37 revised, reference DCN number 884 (2/12/82).
1DQ157A 1DQ396D 1DQ396F 1DQ396H 1DQ396L 1DQ396T 1DQ177E	a) 'As built' vias...DFA08, DJA07... are unacceptable. (Instrument cable installed in control raceway) Field Engineering has been directed to rework cables into vias as stated in E-37. b) 'As built' vias...DJA01, DC002, DTA003...are stated incorrectly on NCR. 'As built' vias (verified by Resident Engineering) are DC002, DTA003... These vias are acceptable as is. E-37 revised reference DCN number 884 (2/12/82).

Bechtel Associates Professional Corporation

777 East Eisenhower Parkway
Ann Arbor, Michigan

Mail Address: P.O. Box 1000, Ann Arbor, Michigan 48106

039360

BLC 12497

February 18, 1982

RECEIVED
FEB 19 1982
FIELD QUALITY ASSURANCE
MIDLAND, MICHIGAN

Consumers Power Company
P. O. Box 1963
3500 E. Miller Road
Midland, Michigan 48640

Attention: B. W. Marguglio

Subject: Midland Plant Units 1 & 2
Consumers Power Company
Bechtel Job 7220
Additional Response to CPCo
NCR M-01-9-2-016 and Bechtel
NCR 3996 AI 5.1.073

References: A) CPCo NCR M-01-9-2-016 dated February 17, 1982
B) Bechtel NCR 3996 dated February 17, 1982

As requested, the following is additional information to the response which we provided to the above-referenced NCRs.

Cables 1DQ157A, 1DQ396D, 1DQ396F, 1DQ396H, 1DQ396L, 1DQ396T, 1DQ177E, (NCR M-01-9-2-016) 1DQ403E, 1DQ403D, and 2BB5626A (NCR 3996) have been reviewed for control/power and instrument cables being routed together. Based on an induced voltage calculation for the power cable (2BB5626A), cable characteristics, and length of run, engineering has determined that if these cables were to have been left in the as-installed condition, they would not adversely affect the safety operation of the plant through its design life.

If you have any questions on the subject, please advise.

L. H. Curtis
Project Engineering Manager

LHC/PJC/GDW/sll

Written Response Required: No

cc: M. Schaffer
D. Turnbull
W. Bird
D. Taggart

ACTION PRINT	NFS
INFO PRINTS	
ROUTING	ONT
TO FILE	
THIS COPY FOR → ORIG TO FILE	16.0

NR M-01-9-2-016
AI: S-1273
Attachment

This is Project Engineering's complete response:

CABLE SCHEME NUMBER	EVALUATION
0AB6501N 2AB6302K 0AB6502M 1AB5301K	'As built' routes as stated are acceptable. Use as is; E-37 revised, reference DCN number 884 (2/12/82).
0BY3614A	'As built' via BSL938 is stated incorrectly on NCR. 'As built' via (verified by Resident Engineering) is BSL937. This via is acceptable as is. E-37 revised, reference DCN number 884 (2/12/82).
1DQ157A 1DQ396D 1DQ396F 1DQ396H 1DQ396L 1DQ396T 1DQ177E	a) 'As built' vias...DFA08, DJA07... are unacceptable. (Instrument cable installed in control raceway) Field Engineering has been directed to rework cables into vias as stated in E-37. b) 'As built' vias...DJA01, DC002, DTA003...are stated incorrectly on NCR. 'As built' vias (verified by Resident Engineering) are DC002, DTA003... These vias are acceptable as is. E-37 revised reference DCN number 884 (2/12/82).

8/1298

Attachment 2 to Report on Cable Installation

To: R. W. Marguglio
From: L. H. Curtis

NONCONFORMANCE REPORT

Priority: 1 SU: CD-88 Trend: B-3 (B-5) I-3, (I-5) AI: S-1289 Page 1 of 5

Project Name: Midland 1 & 2	7. Nonconforming Part No: See below	8. Nonconforming Part Name: Electrical Cables	1. NCR Serial No: M01-9-2-021
			2. Date: 2/16/82
Serial Number: N/A	10. Org. Responsible: Bechtel Construction/ QC/Project Engineering	11. Area/Loc. of NC: Various Class 1E Locations	3. N/A
			4. File No: 16.0

Description of nonconforming condition versus "as required" condition with refs:

MPQAD overinspections have determined that the actual routing of the listed cables does not conform to the required routing.

The "AS IS" condition of cable routing and the "AS REQUIRED" cable routing, taken from Electrical Circuit Schedule E-37, Rev 52, are listed adjacent to the cable scheme numbers and routing inconsistencies underlined.

The "AS IS" condition of cable routing does not also conform to the "AS REQUIRED" routing referenced in Bechtel PQCI 7220/E-4.0, which was used by Bechtel for inspection and acceptance of cables. The cable routing given by E-37, Rev 52, is identical to that referenced by PQCI/E-4.0 for each of the listed cables. (Cont'd)

5. Distribution

Action Copy: LHCurtis/PCorcoran, LEDavis, ESmith

Info Copy: DScott, DATaggart, WRBird, DMTurnbull, JWCook, RAWells, MLCurland, JLWood, MADietrich, ALAB-2, RDJohnson, BWMarguglio, REMcCue, DBMiller, BHPeck, JARutgers, MJSchaeffer

Recommendation for Part CA:

Bechtel Engineering is requested to evaluate the impact of the "AS IS" cable routing to determine acceptability and advise Bechtel Construction accordingly. (LHCurtis)

Design/Project Eng. Disposition Required [X] Not Required [ ] (Continued on page 5)

Hold tag applied: Yes [ ] No [X] — Number, location & type of hold tags applied:

Process CA required: Yes [X] No [ ] If no, explain justification below:

RECEIVED FEB 19 1982 FIELD QUALITY ASSURANCE MIDLAND, MICHIGAN

Does NC affect Q-List items: Yes [X] No [ ]	17. Is NC reportable per 50.55(e): Yes [ ] No [X]
Is NC reportable per Part 21: Yes [ ] No [X]	19. If yes, date & time of report to NRC: N/A
If yes, and made report to NRC: N/A	21. If yes, name of NRC official to whom reported: N/A
NC originated by: M J Schaeffer MJS	23. Written reply required by: 2/18/82 — To establish CA completion date	24. Supervisor's signature/date: Michael J Schaeffer 2/16/82

Part CA disposition, justification & completion date:

PROJECT ENGINEERING'S COMPLETE RESPONSE IS ATTACHED.

cc: D. Borlaza, P. Corcoran, R. Hollar, G. Warner, L. Curtis, J. Horsch, D. Turnbull, J. Kovach

ACTION PRINT	MJS
INFO PRINTS	
MPQA ROUTING	DMT
PRINT TO FILE	
ORIG TO FILE	16.0

THIS COPY FOR

Design/Project Sig. Auth. Disp.: 2/17/82 [signature]	27. PMO Sig. Auth. Disp.: N/A	28. Procurement Sig. Auth. Disp.: N/A	29. Sig. of Org. Resp. for C/A: [signature] for LHCurtis 2/17/82
Sig. Auth. Disp.:	31. Sig. of Test Group Acknow. Condition: N/A	32. For Major NCR - Pl. Supt. Sig. Auth. Disp.: N/A	33. QA Auth. Sig. to Implement Disp.:

Method of Part CA verification:

Sig. of Org. Resp. for Part C/A Verifying Completion:	36. Sig. Verifying Part C/A & Hold Tag Removal/Date:	37. NCR Closed By/Date: (Part & Process CA Complete)

71298

Consumers Power Company

NONCONFORMANCE REPORT
PROCESS CORRECTIVE ACTION

PP U.S. ENGINEERING AND CONSTRUCTION - QUALITY ASSURANCE DEPARTMENT
M-01-9-2-021
NCR SERIAL NUMBER: _____
PAGE 2 OF 5

A. ASSESSMENT OF ROOT CAUSE(S):

Bechtel Construction and QC in conjunction with Project Engineering, to determine the root cause and inform MPQAD. (LEDavis & ESmith)

ACTUAL ROOT CAUSE(S), IF DIFFERENT FROM ABOVE (TO BE COMPLETED BY ORG. RESPONSIBLE FOR PROCESS CA):

PROCESS CA ASSIGNED FROM:
DESIGN ☐ FABRICATION ☐ CONSTRUCTION ☒ PROCUREMENT ☐ INSPECTION ☒
OTHER

B. RECOMMENDATION FOR PROCESS CA:

Determine the need for additional Process Corrective Action in view of the fact that MPQAD NCR M-01-9-2-016, dated 2/11/82, addressed a similar problem. Inform MPQAD of the decision and action taken to preclude re-occurrence of the cable routing discrepancies. (LEDavis & ESmith)

PROCESS CA TO BE TAKEN BY ORG(S) CHECKED IN BLOCK 4A & DATE OF COMPLETION:

METHOD OF PROCESS CA VERIFICATION:

5A. PROCESS CA COMPLETION VERIFIED BY/DATE:

12. "AS IS"NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
1DQ 173 D 1DQ 173 E 1DQ 173 F	AS REQUIRED ROUTING: DSL907, DGA01, DWW001, DTB07, DTB06, DH015, DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC003, DTA002, DTA21.
1DQ 177 F 1DQ 181 B 1DQ 181 D 1DQ 181 F 1DQ 181 H	AS IS ROUTING: Coil at DJ475, DTB001, DTB03, DTA07, DTA06, DTA05, DTA04, DTA03, DTA02, DTA01, DC002, DTA003, DTA21.
CAB 6502 M 2AB 6302 K	AS REQUIRED ROUTING: ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, AJF02, AKF01, AKA02, AKA03, AKA04, AKA054.
	AS IS ROUTING: ASL921, AFD09, AFA09, AFU99, AFV08, AFV07, AFD06, AFD05, AFD04, AFD03, AFD02, AFD01, AJF01, *, AKA01, AKA02, AKA03, AKA04, AKA054.
2BI 003 A 2BI 004 A	AS REQUIRED ROUTING: BG042, BJ637, BG043, BG044, BG045, BJ1371, BG046, BA045, BVA005, BVA01, BVA98, BVA99.
	AS IS ROUTING: BG042, BJ637, BG043, BG044, BG045, BJ1371, BG046, BA045, BVA005, *, *, BVA99.
1AG 1113 E	AS REQUIRED ROUTING: ASL151, ADA005, ADA05, ADA04, ADA03, ADA02, ADA01, AJ424, AA033, AKF01, AJL003, AJL01, AFP01, AFP02, AFP03, AFN02, AFN01, AFL01, AFL03, AFL10, AJS07, AJS08, AJS09, ASL933.
	AS IS ROUTING: ASL151, ADA005, ADA05, ADA04, ADA03, ADA02, ADA01, AJ424, AA033, AJF01, AJL003, AJL01, AFP01, AFP02, AFP03, AFN02, AFN01, AFL01, AFL03, AFL10, AJS07, AJS08, AJS09, ASL935.

* Denotes that via was skipped

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	
1BG 1213 B	AS REQUIRED ROUTING: BDA005, BDA05, BDA04, BDA03, BDA02, BDA01, BJ419, BA031, BJ524, BJA073, BJA05, BJN05, BJP01, BFH01, BFH02, BFH03, BFH04, BFH05, BFH06, BFH07, BFH08, BFH09, BFH10, BFH11, BFH12, BFH13, BFH14, BFA13, BFA14, BFA15, BFA002, BFF09.
	AS IS ROUTING: BDA005, BDA05, BDA04, BDA03, BDA02, BDA01, BJ419, BA031, BJ524, BJA073, BJA05, BJN05, BJP01, BJP02, BFH02, BFH03, BFH04, BFH05, BFH06, BFH07, BFH08, BFH09, BFH10, BFH11, BFH12, BFH13, BFH14, BFA13, BFA14, BFA15, BFA002, BFF09.
1BB 5610 C	AS REQUIRED ROUTING: BSL922, BJH01, BKA06, BKA05, BKE01, BJF03, BFB01, BFB02, BFB03, BFB04, BFB05, BFB015, BJ106.
	AS IS ROUTING: BSL922, *, *, BKA05, BKE01, BJF03, BFB01, BFB02, BFB03, BFB04, coiled.
1BA 0012 A	AS REQUIRED ROUTING: BFF09, BFA002, BFA15, BFA14, BFH14, BFH13, BFH12, BFH11, BFH10, BFH09, BFH08, BFH07, BFH06, BFH05, BFH04, BFH03, BFH02, BFH01, BJP01, BJN05, BJA05, BJA073, BJ524, BA031, BJ419, BDA01, BDA02, BDA03, BDA04, BDA05, BDA06, BDA07, BDA10.
	AS IS ROUTING: BFF09, BFA002, BFA15, BFA14, BFA13, BFH14, BFH13, BFH12, BFH11, BFH10, BFH09, BFH08, BFH07, BFH06, BFH05, BFH04, BFH03, BFH02, *, BJP01, BJN05, BJA05, BJA073, BJ524, BA031, BJ419, BDA01, BDA02, BDA03, BDA04, BDA05, BDA06, BDA07, BDA10.
1BI 067 A	AS REQUIRED ROUTING: BG083, BJ1763, BVA022, BVA16, BVA15, BVA14, BVA13, BVA12, BVA001, BVA06, BVA05, BVA04, BVA03, BVA02, BVA01 to 1Z132.
	AS IS ROUTING: BG083, BJ1763, BVA022, BVA16, BVA15, BVA14, BVA13, BVA12, BVA001, BVA06, BVA05, BVA04, BVA03, BVA02,

12. "AS IS" NONCONFORMING CONDITION VERSUS "AS REQUIRED" CONDITION WITH REFS:

CABLE SCHEME NUMBER	AS REQUIRED ROUTING	
	FROM	TO
2BA0001F	2C46	2J1145

BGF08, BWW023, BGC01, BGB02, BGB01, BTG01, BTB06, BTB011, BJ924, BA035, BJ690, BN054

AS IS ROUTING:

FROM	TO
2C46	2C232

BN054, BJ690, BA035, BJ924, BTB011, BTB06, BTG01, BGB01, BGB02, BGC01, BWW023, BGF08

13. QA RECOMMENDATION FOR PART C&:

B)

1. Bechtel Construction is requested to comply with the E-37 Rev 52, or direction from Project Engineering per (A) above. (LEDavis)

2. Bechtel QC is requested to update the applicable QCIRs to reflect the nonconforming condition identified. (ESmith)

7125c

NCR M-01-9-2-02
AI: S-1289
Attachment

This is Project Engineering's complete response.

Cable Scheme Number	Evaluation
1DQ173D 1DQ173E 1DQ173F 1DQ177D 1DQ177F 1DQ181B 1DQ181D 1DQ181F 1DQ181H 0AB6302M 2AB6302K 2BI003A 2BI004A 1AG113K 1BB5610C 1BA0012A	"As-built" routes as stated are acceptable. Use as is; E-37 has been revised; Reference DCN Number 885 dated February 17, 1982
1BG1213E	"As-built" via 1BJP02 is incorrectly stated on the NCR. The as-built route is ...BJP01, BFH02...; E-37 has been revised to reflect this route; Reference DCN Number 885 dated February 17, 1982
1BI067A	The scheme cable number is incorrectly stated on the NCR. The cable number should be 2BI067A. The as-built route for 2BI067A as stated is unacceptable. Field Engineering has been directed to rework the cable into the vias as stated in E-37.
2BA0001F	The "To Location" (2C232) as stated on the NCR is incorrect. The cable is pulled and terminated per the as required routing (2J1145). Therefore, a nonconforming condition does not exist for this cable.

Attachment 2 to Report on Cable Installation

0712 96

NONCONFORMANCE REPORT

1. PROJECT NAME: MIDLAND UNITS 1 & 2 — JOB NO. 7220 — 19. NO. 3996 — 20. PAGE 1 OF 7

2. UNIT(S): 1 & 2 — 3. DRAWING/PART NO.: N/A — REV — 4. ITEM DESCRIPTION: CABLES PULLED THROUGH UNSPECIFIED VIAS — 5. ITEM LOCATION: VARIOUS

6. P.O. OR SPEC NO.: N/A — 7. SERIAL NO.: N/A — 8. REPLACEMENT PART P/N ____ REV ____ SER NO. N/A — 9. SOURCE: CONSTRUCTION — 10. CONTRACTOR/SUPPLIER: N/A

11. INSPECTION CRITERIA ( ) DWG ( ) SPEC ( ) OTHER — IR NO. EFE 4.00 Rev. 5 — 12. ASME AUTHORIZED INSPECTION REQ'D ( ) YES (X) NO — 13. SKETCH ATTACHED ( ) YES (X) NO — 14. Discovered During ( ) Rec's (X) Const ( ) Test — 15. Equip Furnished By ( ) Client (X) Eng ( ) FLD

16. NONCONFORMING CONDITION: OVER-INSPECTION IN SUPPORT OF MPQAD, REVEALED THE FOLLOWING NON-CONFORMING ITEMS:

SEE CONTINUATION SHEETS FOR LIST OF NONCONFORMANCES.

24. DISPOSITION CONCURRENCE: rework — reject — repair — use as is X

[signature] PROJECT FIELD ENGINEER — DATE 2/19/82

[signature] PROJECT ENGINEER — DATE 3/1/82

D.S.P. [signature] PROJ CONSTR QC ENGINEER — DATE 2/24/82

AUTHORIZED INSPECTOR — DATE

25. DISPOSITION RESULTS

17. REPORTED BY: Dale S. Presley — DATE 2-17-82

18. VALIDATED BY: D.S.P. [signature] — DATE 2/17/82

21. ROUTING: (X) TO FIELD ENGINEERING ( ) TO OTHERS (SPECIFY)

22. (X) Field Engineering Disposition — Item 17, 28, & 29 — (X) Field Engineering Recommended Disposition to Project Engineering — Item 1→16, 18→27

Field engineering recommended disposition to project engineering for cables on continuation sheet for block 16. Cable numbers follow: Cables 1 through 16, 18 through 27 inclusive. See continuation for block 22 for cables, 17, 28, & 29.

23. PROJECT ENGINEERING DISPOSITION

ITEMS 1,2,3,4,5,7,8,10,11,12,13,14,15,16,20,21,22,23,24,25,26, & 27 HAVE BEEN RE-ROUTED PER DCN #885 to E37 to REFLECT AS INSTALLED CONDITION. USE AS IS

ITEMS 6 & 9 REFLECT AS BUILT CONDITION PER REV 52 OF E37 - NO DWG. REVISION RQD. USE AS IS

ITEMS 18 & 19 HAVE BEEN DELETED PER DCN #885 to E37

[signature] for JGK 2/17/82 — [signature] 2-17-82 — [signature] 2/17/82

26. QC ACCEPTANCE

QC ENGINEER — DATE

AUTHORIZED INSPECTOR — DATE

REQ Ñ 2/17/82 [handwritten margin note]

Track 16 (continued)

(1) Cable 2BB4405 B 2GTD
Requirements: Per E-37 Rev. 52, Vias ..... BJM01, BJB03 .....
Contrary to the above, cable installed in vias .... BJM01, BJM02, BJB03 ....

(2) Cable 2BB4406 B 2GTC
Requirements: Per E-37 Rev. 52, Vias .... BJM01, BJB03 ....
Contrary to the above, cable installed in vias .... BJM01, BJM02, BJB03 ....

(3) Cable 2BB4402 B 2GTB
Requirements: Per E-37 Rev. 52, Vias ... BJM01, BJB03 ....
Contrary to the above, cable installed in vias .... BJM01, BJM02, BJB03 ....

(4) Cable 2BB4409 B 2GTE
Requirements: Per E-37 Rev. 52, Vias BSL953, BJK01, BJA04, BJM01, BJB03 ....
Contrary to the above, cable installed in vias BSL953, BJK01, BJA04, BJM01, BJM02, BJB03 ....

Attachment 2 to Report on Cable Installation

Block 116 (continued)

⑤ Cable 1AB5514 B 1BNA
Requirements: Per E-37 Rev. 52, VIAS ..... AJA05, AJC01 ... AZ077 ...
Contrary to the above, cable installed in VIAS .... AJA05, AJA06, AJC01 .... AZ076 ....

⑥ CABLE 1AB5514 A 1BNA
REQUIRMENTS: PER E-37 REV. 52 VIAS AJL05, AJC01
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS AJL05, AJL06, AJC01

⑦ CABLE ZBB4401 B 265B
Ⓐ REQUIRMENTS: PER E-37 REV. 52 VIAS BJH01, BJB03
CONTRACY TO THE ABOVE, CABLE INSTALLED IN VIAS BJH01, BJH02, BJB03
Ⓑ REQUIRMENTS: PER E-37 REV. 52 VIAS BSL951 ....
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS BSL952 ....

⑧ Cable 1AB1704 B 1BKA
Requirements: Per E-37 Rev. 52 VIAS .... AKC07, AKC041 ....
Contrary to the Above, cable installed in VIAS .... AKC07, AKC08, AKC041 ....

(9) CABLE 1AB1704 A 1BKA
REQUIREMENTS: PER E-37 REV. 52, VIAS .... AKC07, AKC040 ....
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS .... AKC07, AKC08, AKC040 ....

(10) CABLE 1AB2327 A 1EAC
REQUIREMENTS: PER E-37 REV. 52, VIAS ASL396, AJM05, AKA05 ....
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS ASL396, AJM03, AKA05 ....

(11) CABLE 2BB4401 E 2B5A
REQUIREMENTS: PER E-37 REV. 52, VIAS ..... BJF01, BKA04, ...
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS .... BJF01, BKA03, BKA04, ...

(12) CABLE 1AFW082 E 1ALA
REQUIREMENTS: PER E37 REV 52, VIAS ------AJB01B, AJB14 ....
CONTRARY TO ABOVE, CABLE INSTALLE IN VIAS -----AJB01B, AJT14, AJB14 ..

(13) CABLE 1AFW021 B 1ALA
REQUIREMENTS: PER E-37 REV. 52, VIAS .... AJB01B, AJB14 ....
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS .... AJB01B, AJT14, AJB14 ....

(14) CABLE 1BB5638 A 1ABA
REQUIREMENTS: PER E-37 REV. 52, VIAS BSL927, BJH06, BKA04 ....
CONTRARY TO THE ABOVE, CABLE INSTALLED IN VIAS BSL927, BKA04 ....

(15) Cable 1BB2444 Q 1BGC
Requirements: Per E-37 Rev. 52, Vias BSL430, BKA06 ....
Contrary to the above, cable installed in vias BSL430, BJH11, BKA06 ....

(16) Cable 1BB5605 B 1ECB
Requirements: Per E-37 Rev. 52, Vias BSL921, BJH01, BKA06 ....
Contrary to the above, cable installed in vias BSL921, BKA06 ....

(17) Cable 2BB5626 A 2ALA
Requirements: Per E-37 Rev. 52, Vias BSL926, BKF03, BKA03, BKA04 BKA05, BKA06 ....
Contrary to the above, cable installed in vias BSL930, BKF01, BTB06, BJB06, BKA06 ....

(18) Cable 1BB5626 A 1ALA
Requirements: Per E-37 Rev. 52, Vias BSL926, BJH04, BKA05 ....
Contrary to the above, cable installed in vias BSL926, BKA05 ....

(19) Cable 1BB5626 B 1ALA
Requirements: Per E-37 Rev. 52, Vias BSL926, BJH04, BKA05 ....
Contrary to the above, cable installed in vias BSL926, BKA05 ....

(20) Cable 1BB5605 A 1ECB
Requirements: Per E-37 Rev. 52, Vias BSL921, BJH01, BKA06 ....
Contrary to the above, cable installed in vias BSL921, BKA06 ....

Block 16 (Continued)

(21) Cable 1AB5526 A 1ALA
Requirements: Per E-37 Rev. 52, Vias .... AKA05, AJC01 ....
Contrary to the above, cable installed in vias .... AKA05, AKA06, AJA06, AJC01 ....

(22) Cable 1BB2441 B 1BGC
Requirements: Per E-37 Rev. 52, Vias .... BJA20, BJE01 ....
Contrary to the above, cable installed in vias .... BJA20, BJA21, BJE01 ....

(23) Cable 1AB2341 B 1BGC
Requirements: Per E-37 Rev. 52, Vias ASL399, AJM01, AJA06, AJC01 ....
Contrary to the above, cable installed in vias ASL399, AJM01, AJC01 ....

(24) Cable 1AB5512 B 1BGE
Requirements: Per E-37 Rev. 52, Vias .... AJA05, AJC01 ....
Contrary to the above, cable installed in vias .... AJA05, AJA06, AJC01 ....

(25) Cable 2AB5531 A 2PHK
Requirements: Per E-37 Rev. 52, Vias ... AJH02, AKA05 ... ASA03, ASB01, ASL973
Contrary to the above, cable installed in vias ... AJH02, AKA06, AKA05 .... ASA03, 1ASL968

(26) Cable OAB6909 A OEAA
Requirements: Per E-37 Rev. 52, Vias .... ASA02, ASA03, ASA04 ....
Contrary to the above, cable installed in vias ... ASA02, ASA04 ....

(HOLD IX CONTINUED) ( )

(27) Cable OAB6909B OEAA
Requirements: Per E-37 Rev. 52, VIAS .... ASA02, ASA03, ASA04 ....
Contrary to the above, cable installed in VIAS .... ASA02, ASA04 ....

(28) Cable 1BQ403E 1SAB
Requirements: Per E-37 Rev. 52, VIAS BSL170, BJA045, BJA01, BJA02, BJA03, BJA04, BJM01, BJF03 ....
Contrary to the above, cable installed in VIAS BSL170, BJA045, BTA01, BTA02, BTA03, BTA04, BJF03 ....

(29) Cable 1BQ403D 1SAB
Requirements: Per E-37 Rev. 52, VIAS BSL169, BJA044, BJA02, BJA03, BJA04, BJM01, BJF03 ....
Contrary to the above, cable installed in VIAS BSL169, BJA044, BTA02, BTA03, BTA04, BJF03 ....

58 hold tags applied Q-list Nos 3.003
3.007

BLOCK 22 (CONTINUED)
CABLES 27, 28 & 29 WILL BE REWORKED PER E37 REV 52 (I.C.) [signature] 2/17/82

Attachment 2 to Report on Cable Installation

			NO POTENTIAL GENERIC CONCERNS								POTENTIAL GENERIC CONCERNS			
Cable	SK	Loc	Covered by Analysis	Wrapping Criteria	Air Lining at MCCs	Construction Incomplete	Unique Case	Separation, Appendix R	Separation, RG 1.75	No Concerns Total	QC Area Walkdown	Thermal Analysis	Concerns Total	Remarks
1AB5514B	1	GA									X		X	
0AB6909A	2	SH	X							X				
0AB6909B	2	SH	X							X				
1BB2441B	3	GA		X						X				
2BB4401E	4	SG		X						X				
2AB5531A	5	SG		X	X					X				Both ends of cable (b)
1AB5301K	6	DG			X					X				
0BY3614A	7	DG			X					X				
1AG1113E	8	SE				X				X				See footnote (c)
1BA0012A	9	SR		X						X				
1BB5605A	10	SG			X					X				
1BB5605B	10	SG			X					X				
1BB5626A	10	SG			X					X				
1BB5626B	10	SG			X					X				
1BB5638A	10	SG			X					X				
1AB2327A	11	SG										X	X	
2BB5626A	12	SG									X		X	Cable was reworked
1BB5610C	13	SG	X							X				
1AB1704B	14	SG		X						X				
1BB2444Q	15	SG					X			X				Unique (a)
1AFW021B	16	GA				X				X				
1AFW082E	16	GA				X				X				
2B1067A	17	R				X				X				Cable was reworked
2B1004A	18	R									X			
2B1003A	18	R									X			
0AB6501N	19	SH	X							X				
1AB5526A	20	SG										X	X	
1AB5512B	20	SG										X	X	
2BB4401B	21	SG										X	X	
2BB4402B	21	SG										X	X	
2BB4406B	21	SG										X	X	
2BB4405B	21	SG										X	X	
2BB4409B	21	SG										X	X	
0AB6502M	22	SG										X	X	
2AB6302K	22	SG										X	X	
0AB4511H	23	SR										X	X	
1BQ403D	24	SG									X		X	Cable was reworked
1BQ403E	24	SG									X		X	Cable was reworked
1DQ157A	25	SR						X		X				
1DQ396D	25	SR						X		X				
1DQ396F	25	SR						X		X				
1DQ396H	25	SR						X		X				
1DQ396L	25	SR						X		X				
1DQ396T	25	SR						X		X				
1DQ177E	25	SR						X		X				
1DQ177D	25	SR						X		X				
1DQ177F	25	SR						X		X				
1DQ173D	25	SR						X		X				
1DQ173E	25	SR						X		X				
1DQ173F	25	SR						X		X				
1DQ181B	25	SR						X		X				
1DQ181D	25	SR						X		X				
1DQ181F	25	SR						X		X				
1DQ181H	25	SR						X		X				
1AB2341B	26	SG	X							X				
TOTAL			5	5	8	1	1	17		38	2	11	17	

LEGEND

GA	General Auxiliary	DG	Diesel Generator	R	Reactor
SH	Service Water	SE	Safety Equipment		
SG	1E Switchgear Room	SR	Spreading Room		

NOTES

(a) Tied to last rung of riser

(b) Although the total of the "No Concerns" column is 38, the total of the bottom row is 39 because Sketch 5 has a dual condition.

(c) The cable routing as designed was to the wrong control panel compartment. Construction discovered and corrected the error during termination.

DEFINITIONS

1. Covered by Analysis

The actual cable installation did not utilize all the designed raceway vias. Therefore, the absence of a cable would only make the thermal analysis required for tray wrapping and overfilled raceway more conservative.

2. Wrapping Criteria

The tray wrapping criteria requires wrapping of the affected tray and at least 12 inches in adjacent trays.

3. Airlining at MCCs

Cables may be run unsupported or airlined for a maximum distance of three feet upon leaving the physical confines of scheduled raceway (Reference: E-42Q, Sheet 5).

4. Construction Incomplete

Cable Pulling - When a cable is completely pulled tight into all raceways, the problem with cables looping out from one tray to another will be corrected.

Cable Terminations - When Construction attempts to terminate a cable and discovers that the cable is not in the correct compartment of the panel, or the cable is not at the equipment to which the cable is to be terminated, Field Engineering is notified and the condition is corrected.

5. Separation, Appendix R

The design criteria is based on FSAR, Appendix 9A.1.8.3 for achieving and maintaining safe shutdown after a fire (Reference: General Design Criteria 10CFR, Appendix R).

6. Separation, Regulatory Guide 1.75

The Design criteria is based on FSAR, Appendix 3A for achieving physical independence of electrical systems.

7. QC Area Walkdown

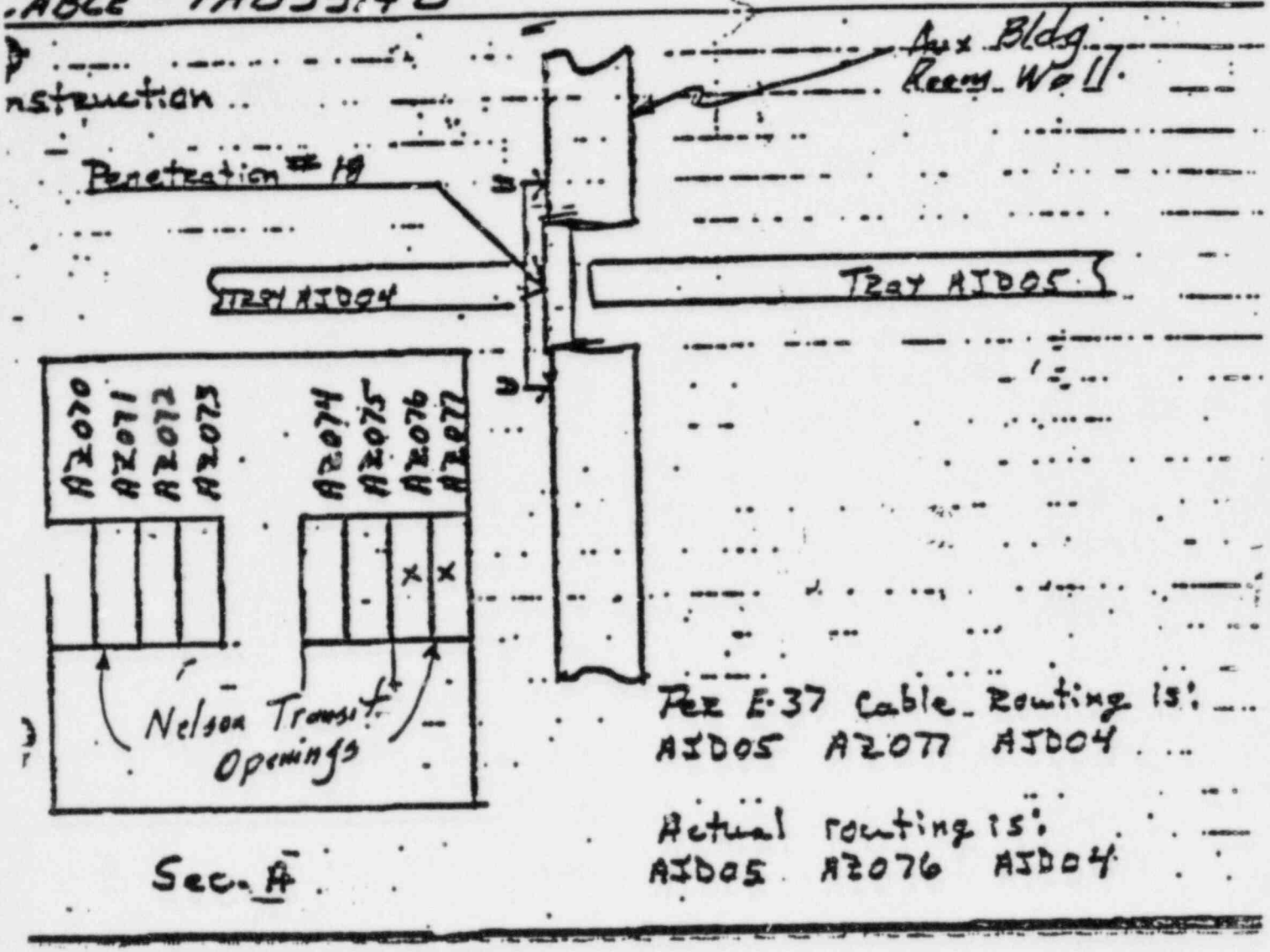
During final area turnover, QC shall verify, in accordance with PQCI 7220/E-3.0, that cables maintain the separation distances as shown in Drawing 7220-E-47, Paragraphs 5.1.3 and 5.1.4, and that all cable installations maintain the proper voltage separation.

8. Thermal Analysis

When a tray is wrapped or overfilled, heat generated from cables in that tray must be taken into consideration. If a cable is pulled into a tray without Project Engineering's knowledge, the thermal analysis will not include that cable, but conservative analytical techniques and inspections described in Sections III and IV resolve the concern.

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

CABLE # 1AB5514B SH # 1



Per E-37 Cable Routing is:
AJD05 A2077 AJD04

Actual routing is:
AJD05 A2076 AJD04

SK-1

Description of Basic Concern

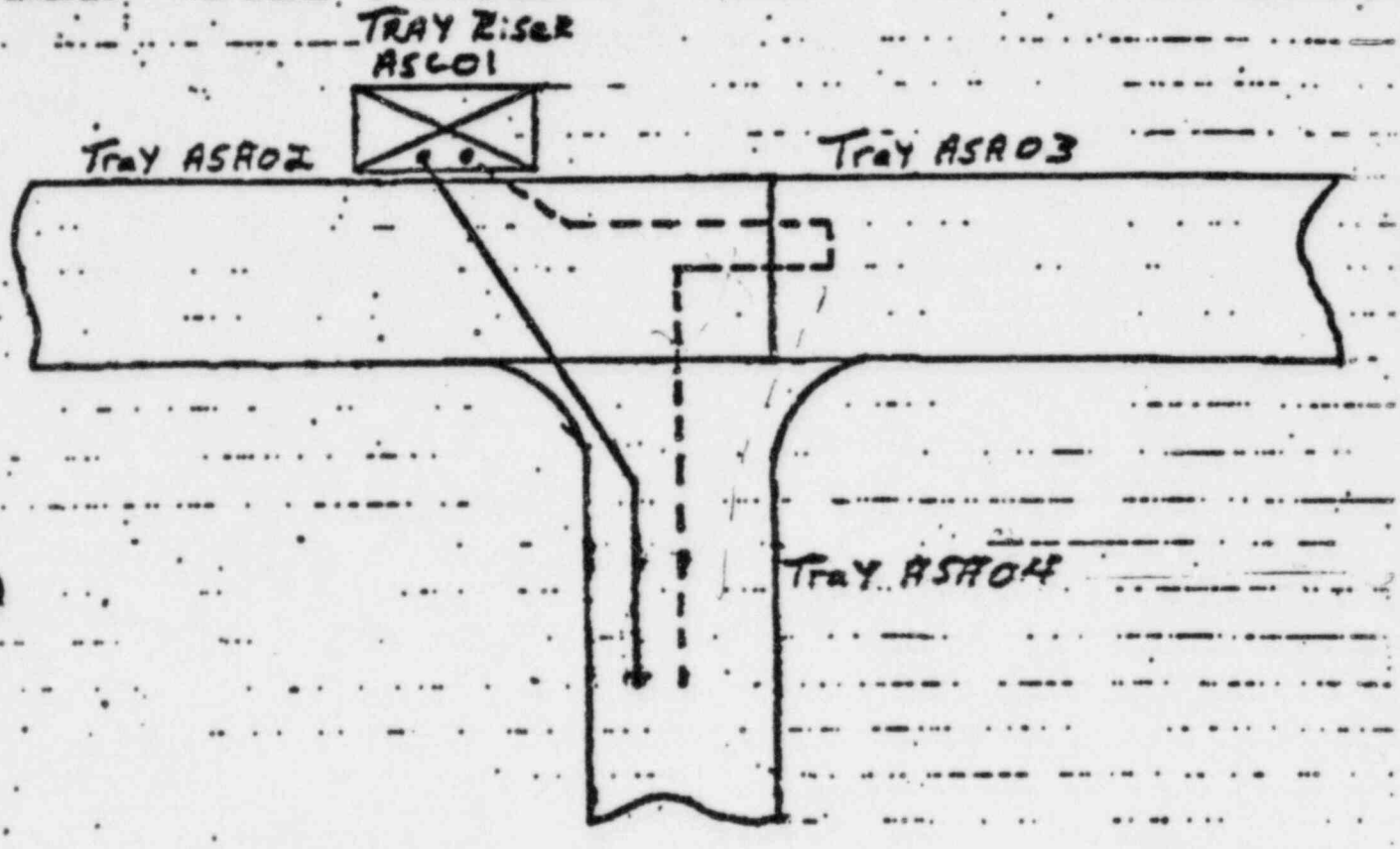
This cable was passed through the wrong Nelson transit (cable seal) window. Both the right and wrong window were for power cables. However, because of the closeness of power and instrument penetrations in the plant, our basic concern was a possible voltage violation if this problem were repeated with a power cable being passed through an instrument cable window.

Reason for No Concern

Quality control will inspect all cable transitions from one raceway to another; this inspection will eliminate this concern.

Cable Code Design B-2 CAB.6709A and CAB.6709B

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable as routed by field

Cable should be per E-37

SK-2

Description of Basic Concern

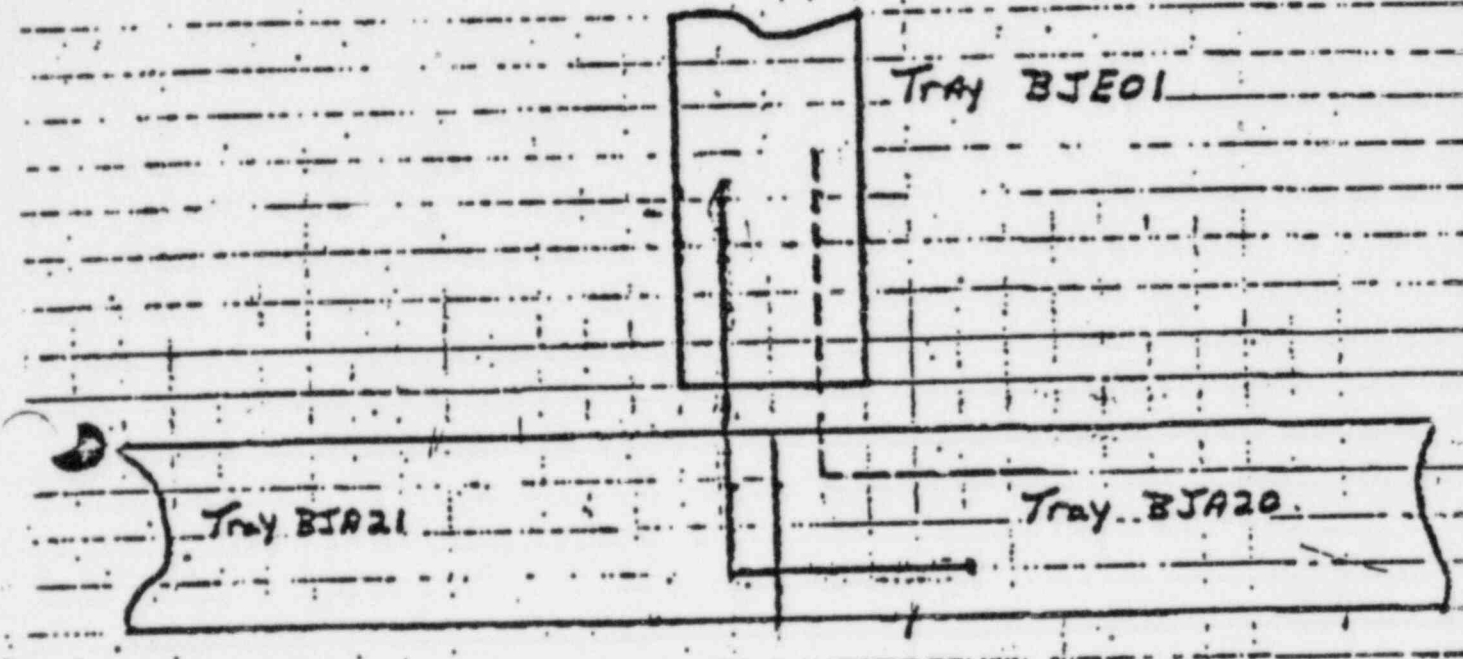
Accountability; i.e., not knowing where a cable is pulled.

Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

Cable No. 1BB244H BE
Code No. C-1
Design



Trays are installed per E-36 and lay out dwgs.

Cable as routed - By field

Cable Should be - Per E-37

SK-3

Description of Basic Concern

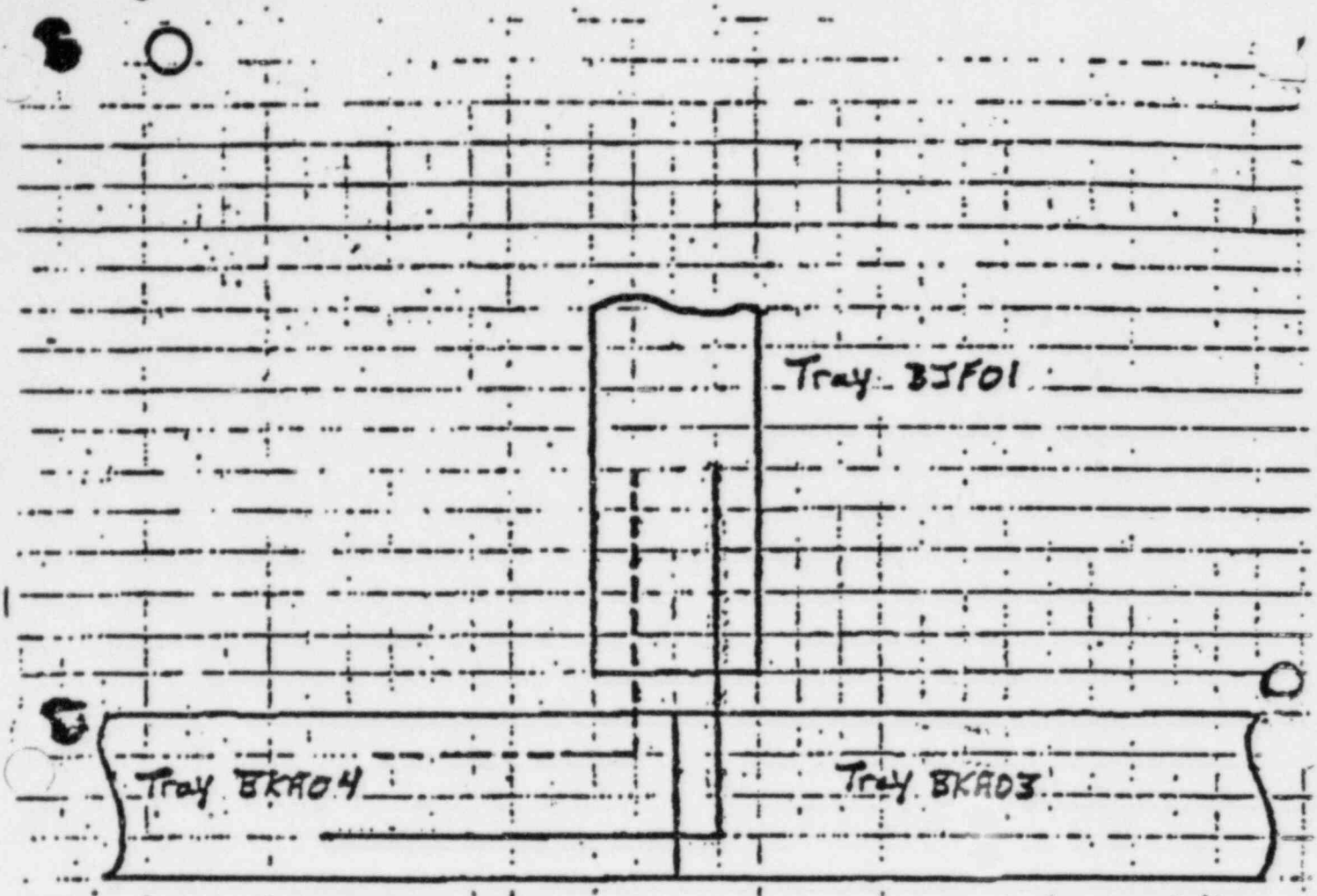
The subject cable enters the confines of an additional raceway. If the trays containing subject cable were required to be wrapped, how do we make sure that the cable portion in the unlisted via is protected.

Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping approximately 12 more inches at each end for safety.

Check

Code ** C-1
Design



Trays are installed per E-3b and lay out drgs.

Cable is routed by field

Cable should be per E-3

check

SK-4

Description of Basic Concern

The subject cable enters the confines of an additional raceway. If the trays containing subject cable were required to be wrapped, how do we make sure that the cable is protected.

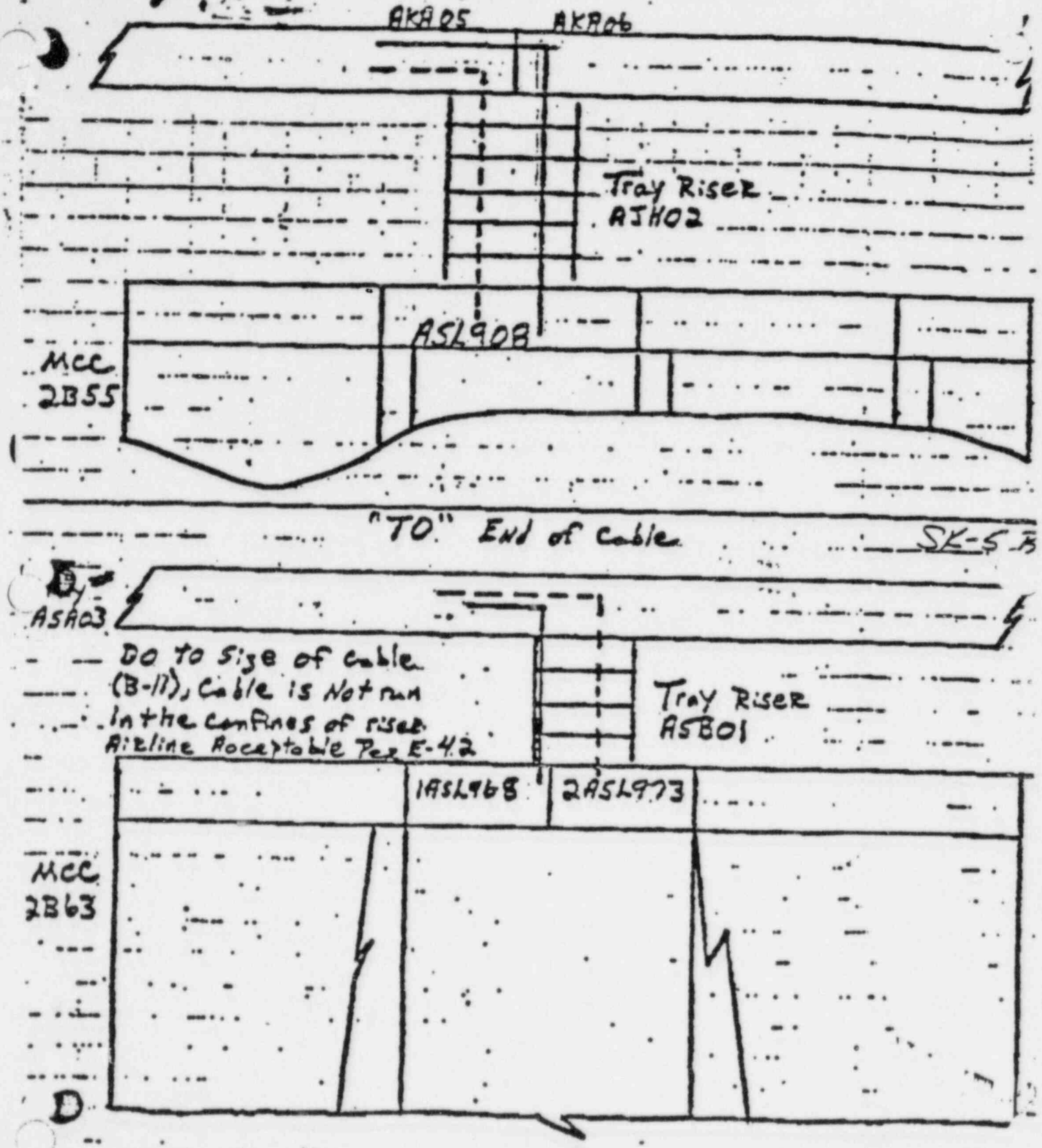
Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping to the edge of the violation and approximately 12 more inches at each end for safety.

Cable = 2AB553A
Code = A-1
Design =

SK-5-A

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is routed by field
Cable Should be routed per E-37

SK-5A and 5B

Description of Basic Concern - SK-5A

The subject cable enters the confines of additional raceway. Also, if the subject cable was required to be wrapped, how do we make sure that the cable is protected.

Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping to the edge of the violation and approximately 12 more inches at each end for safety.

Description of Basic Concern - SK-5B

Cable is airlined, and is not in the riser. It also enters the wrong slot number of the motor control center (MCC). The same slot has two numbers for ease of computer installation. Inspector might read the wrong number.

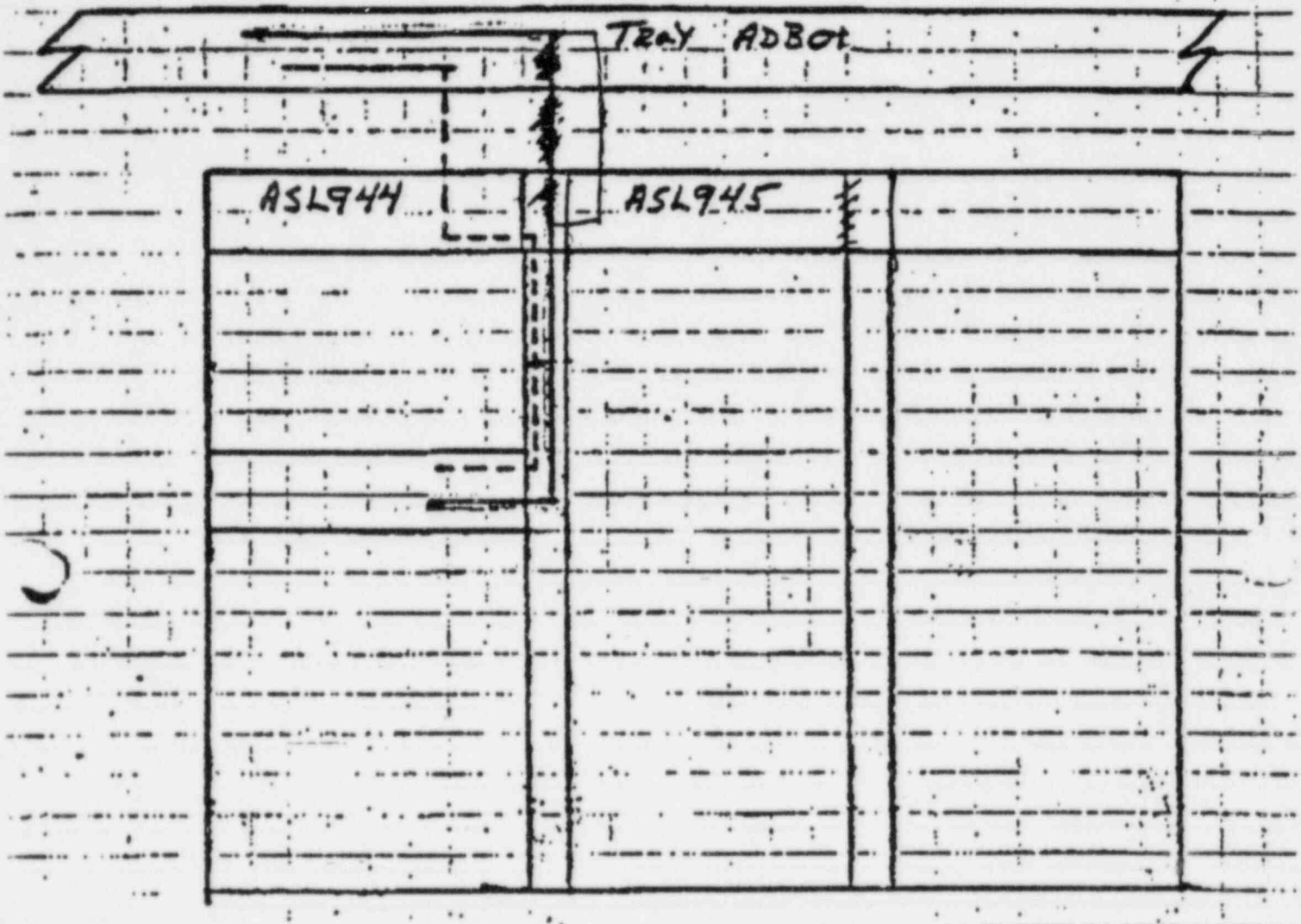
Reason for No Concern

A cable can be airlined 3 feet without engineering approval. The cable enters the correct stack (the subject stack of this MCC has two slot numbers; i.e., one opening, two numbers).

Cable # 1AB5301K
Code # A-1
Design

SK. 4

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is routed by field
Cable Should be routed-Per E-37

SK-6

Description of Basic Concern

Cable enters the wrong stack of the motor control center.

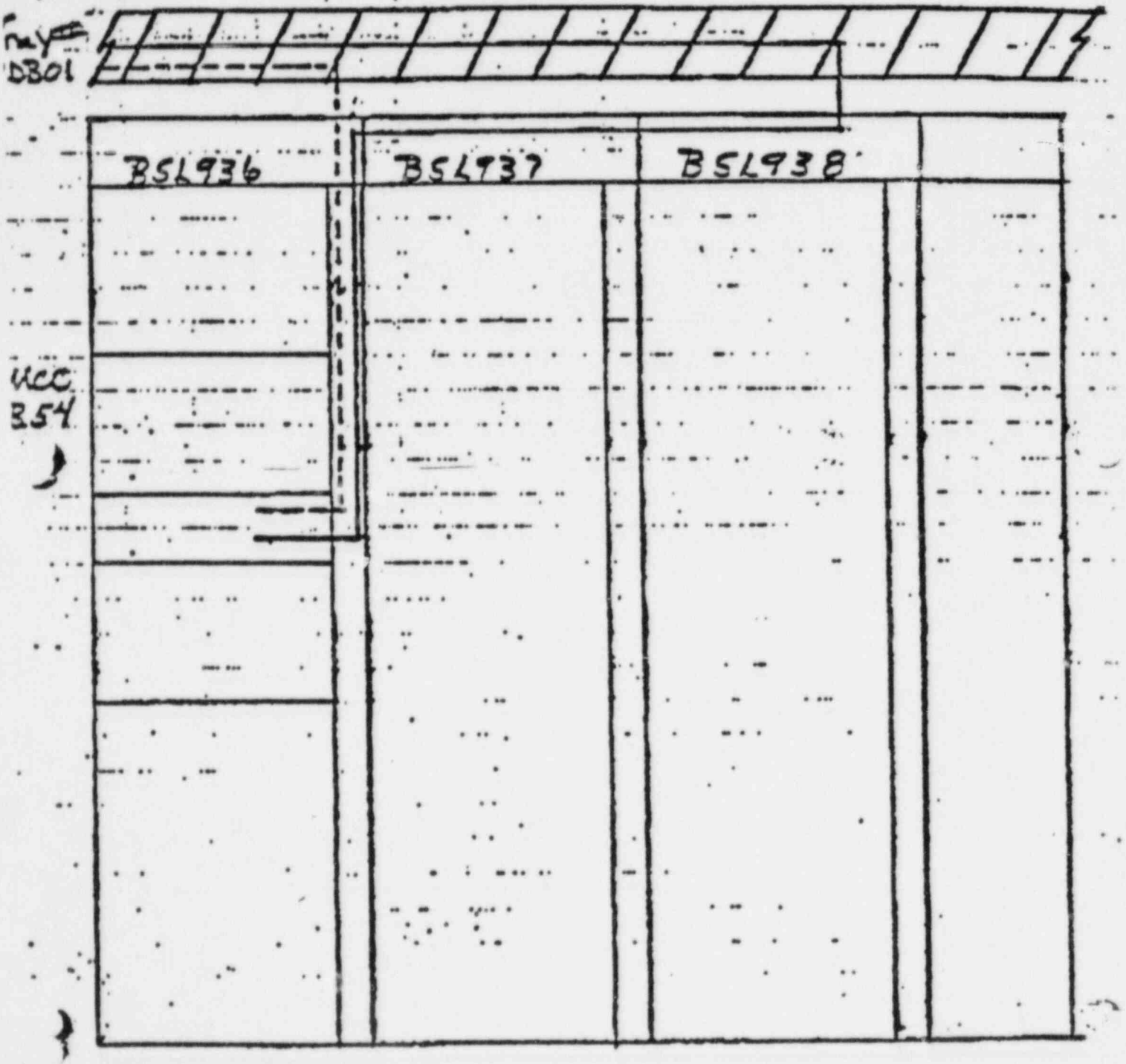
Reason for No Concern

A cable can enter any stack of a motor control center and be terminated because motor control centers are separated by channel.

SK. 7

Cable # OBY3614A
Code = A-1
Design

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installati



Cable is routed by field
Cable should be routed per E-37

SK-7

Description of Basic Concern

Cable enters the wrong stack of the motor control center.

Reason for No Concern

A cable can enter any stack of a motor control center and be terminated because motor control centers are separated by channel.

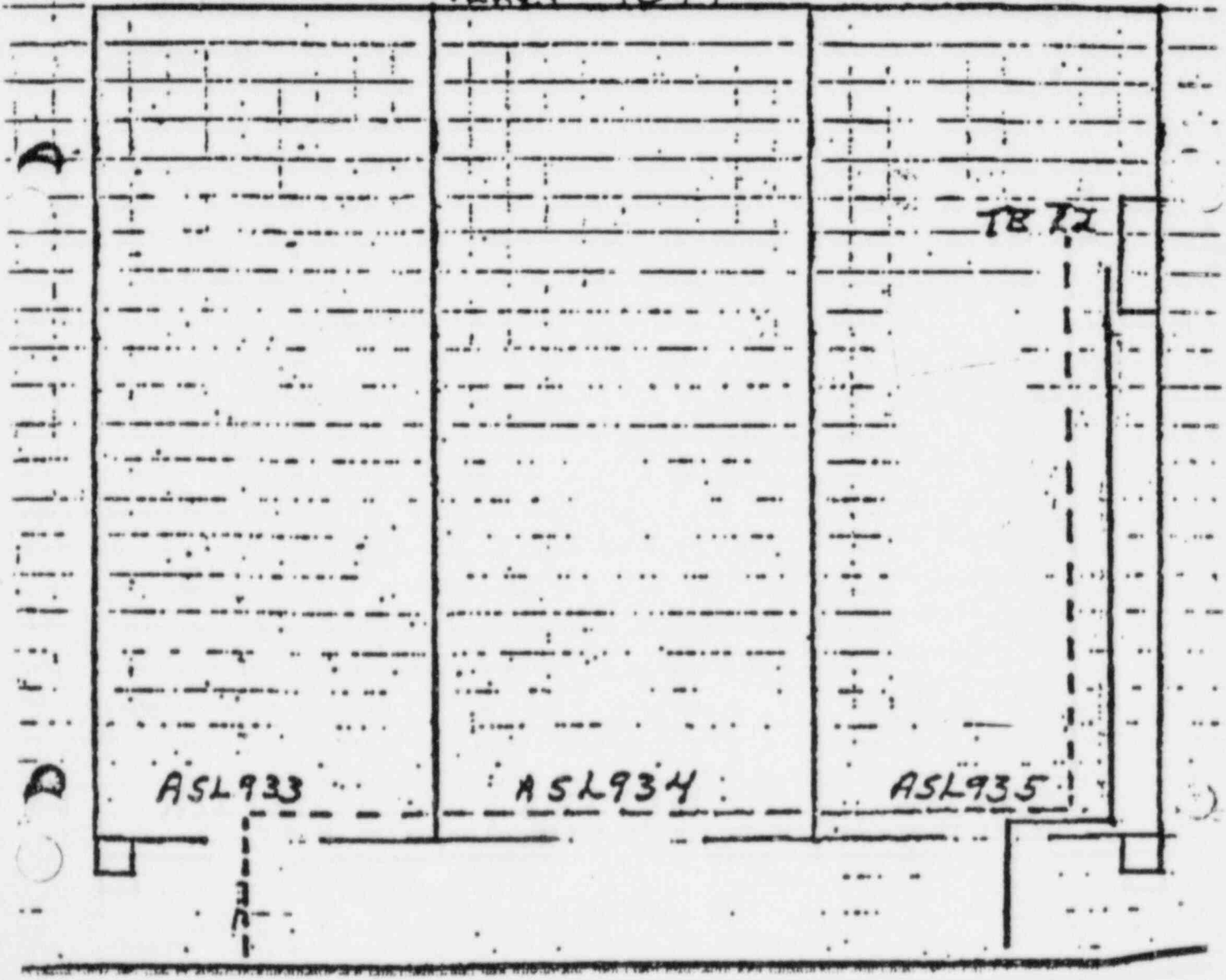
Cable # 1AG1113E

Code # A-L

Design

Is Routed-by field
Should be Routed-per E-37

Panel 1C44



SK-8

Description of Basic Concern

Cable was routed to the wrong compartment of the control panel. Field discovered E37 error then pulled and terminated cable at the correct compartment. E37 did not reflect as-built condition.

Reason for No Concern

When construction attempts to terminate a cable and discovers that the cable is in the wrong compartment, field engineering is notified of the problem.

Code Design A-2

Cable is Routed by Field
Cable should be Routed per E-37

SK-9

Description of Basic Concern

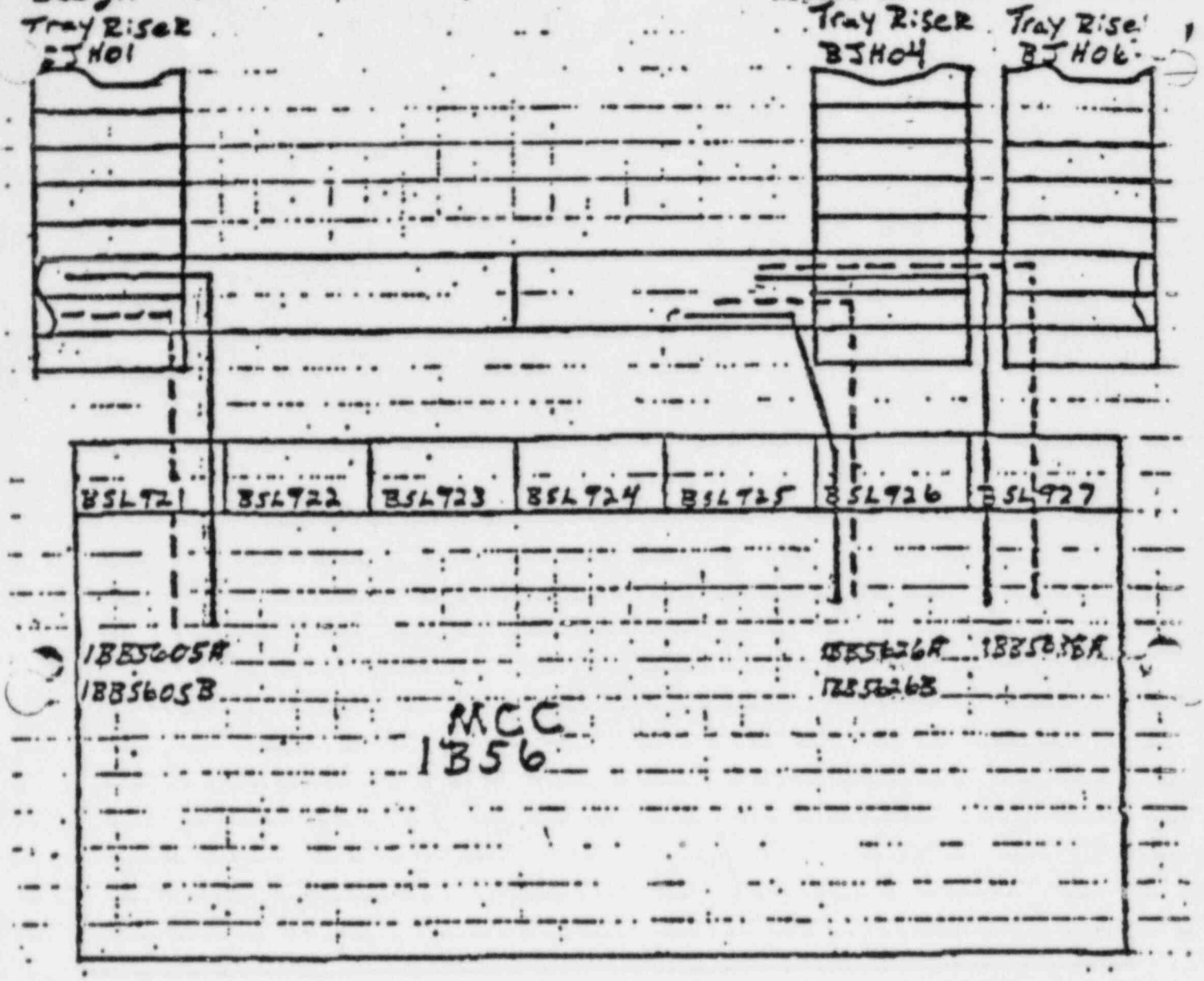
Accountability; i.e., not knowing where a cable is pulled.

Reason for No Concern

Engineering designed the cable to be airlined between E37 designated vias. The criteria, when in a case like this a Class 1E cable leaves the confines of a raceway, the subject cable will be visually inspected for possible separation violation. This inspection will discover this problem.

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

Cable # 1BB5605A FB 1BB5626A FB 1BB5635A SL-10
Code # D-1
Design



Cable is Routed - By Field

Cable Should be - Per E-37

SK-10

Description of Basic Concern

Cables are airlined, and are not in the riser.

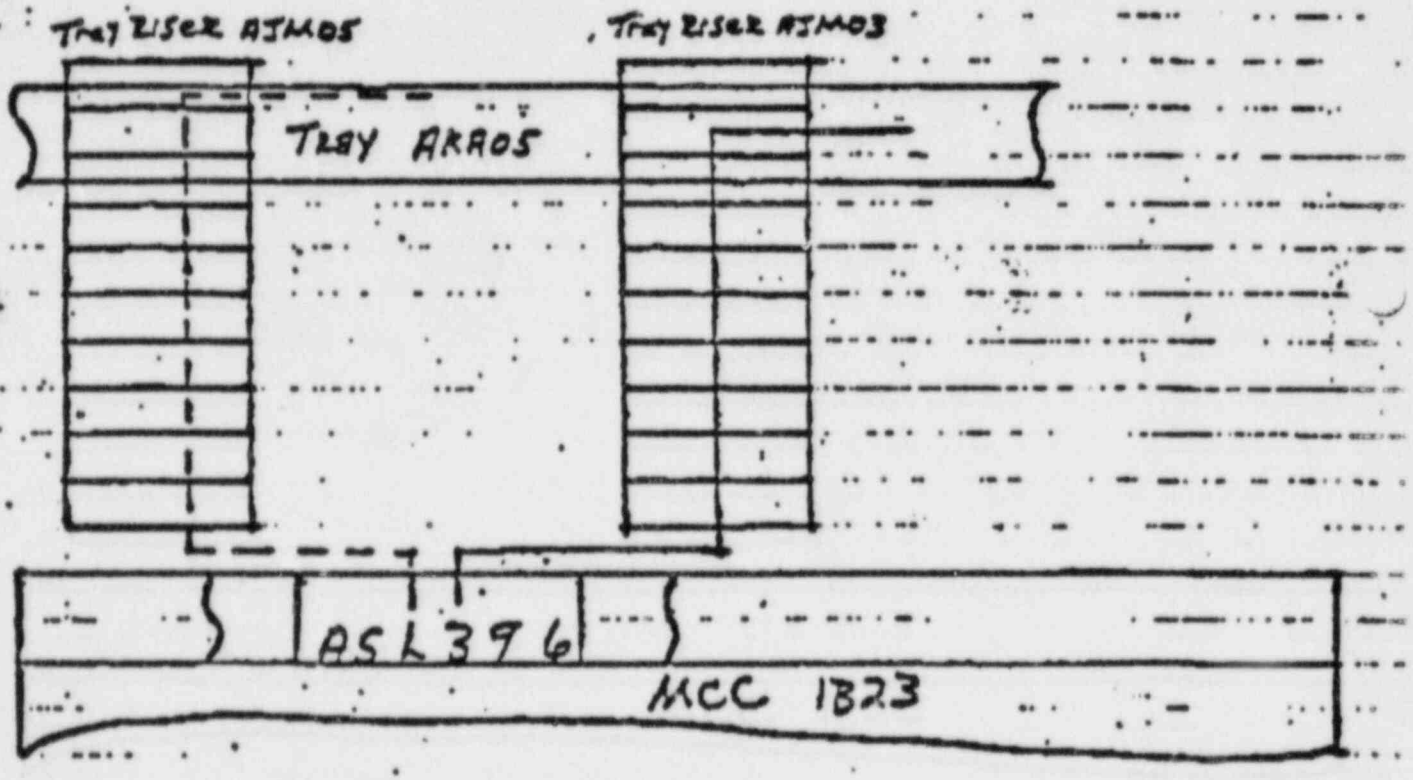
Reason for No Concern

A cable can be airlined 3 feet without engineering approval.

Cable # 1AB2327 A
Code # D-1
Design

SK. 11

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installati-



Cable is Routed- by field

Cable should be- Per E-37

SK-11

Description of Basic Concern

Cable was pulled into tray AJM03 without engineering's knowledge.

Reason for Concern

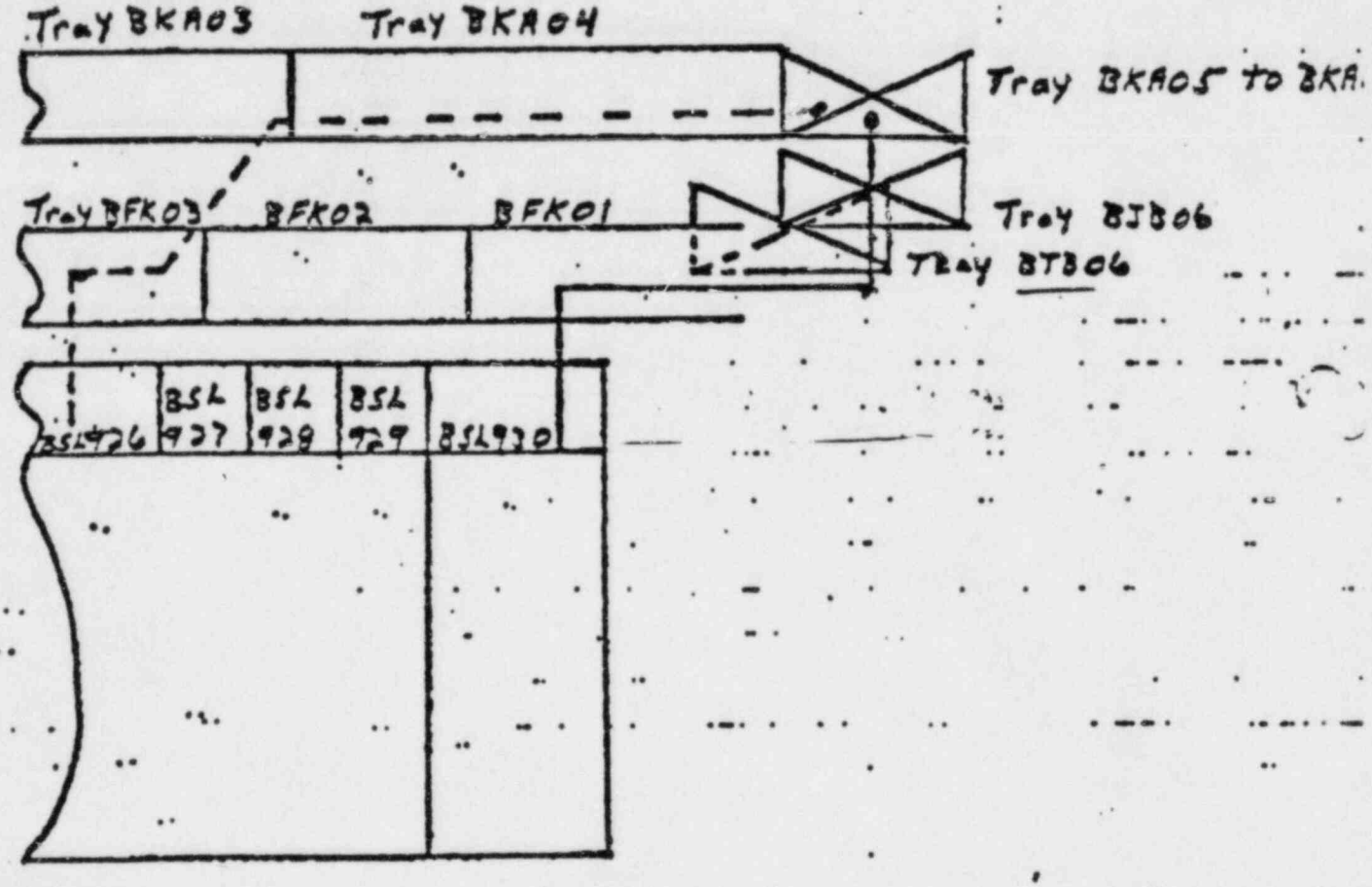
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Cable # 2BB5626A
Code # D-1
Construction

SK. 12

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Cable is Routed - by field

Cable should be - Per E-37

SK-12

Description of Basic Concern

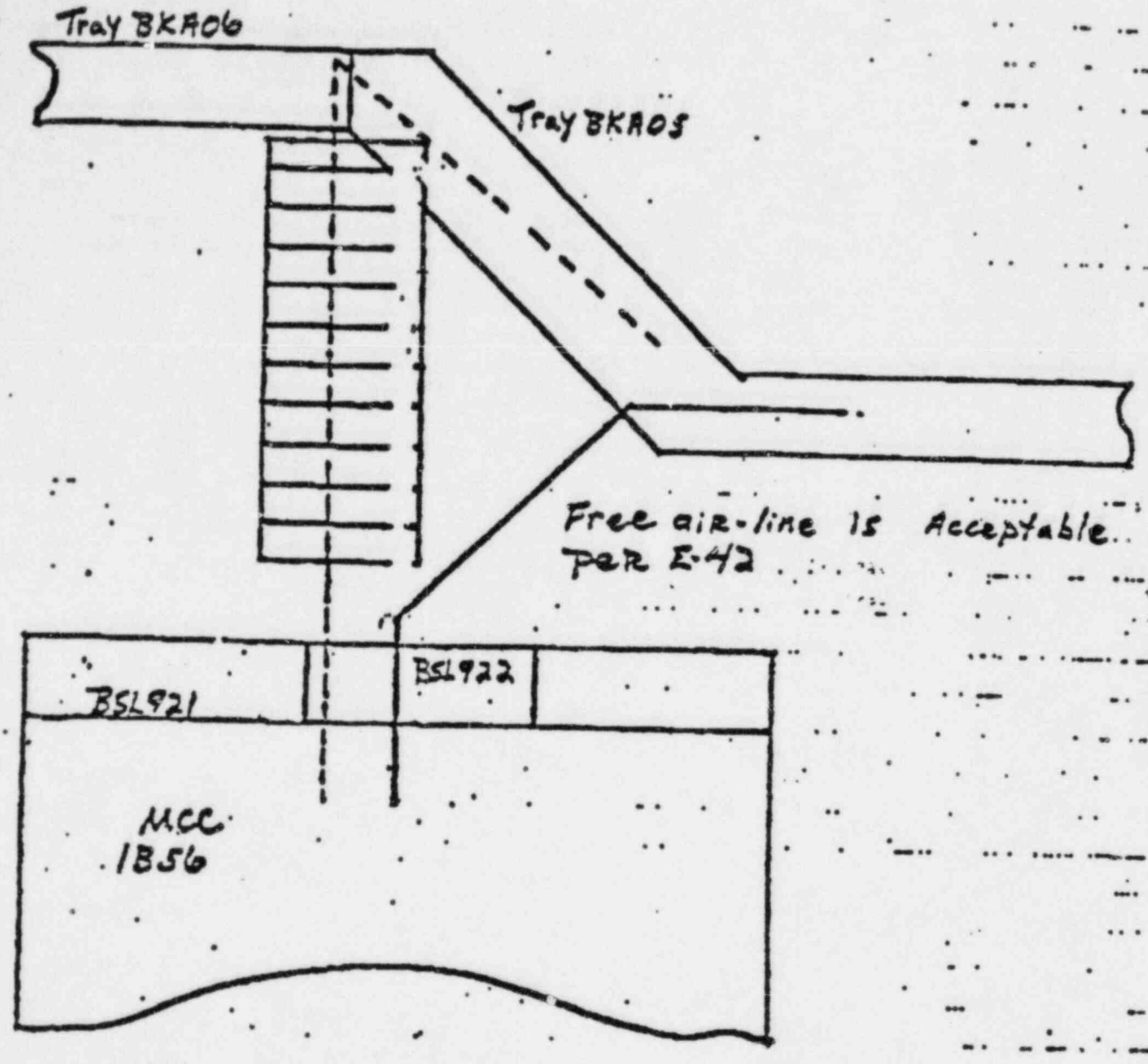
Cable was not installed as routed in E37 and a voltage violation was created when a power cable was run in an instrumentation tray.

Reason for No Concern

Quality control will inspect all cable transitions from one raceway to another; this inspection will eliminate this concern.

Code = D-1
Design

SL.13



SK-13

Description of Basic Concern

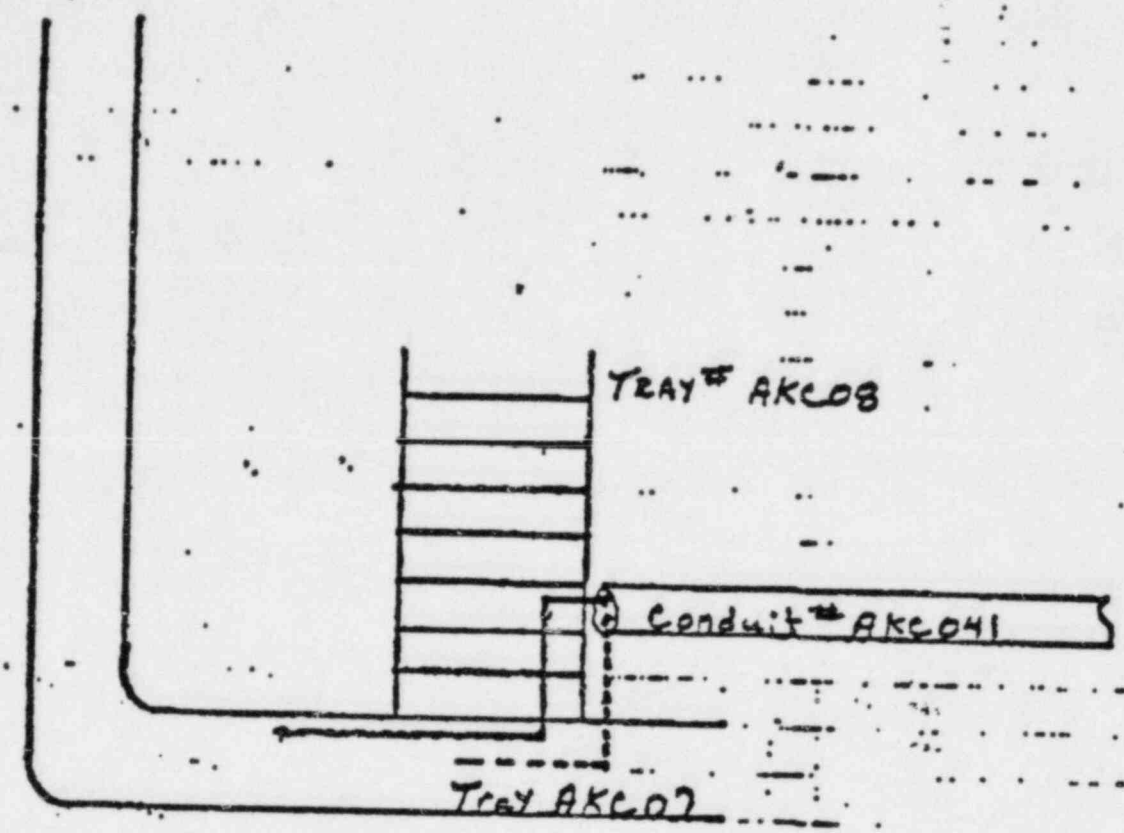
Accountability; i.e., not knowing where a cable is pulled.

Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.

Cable = 1AB1704B
Code = B-1
Construction

SK.14



——— Cable is routed - by field
– – – – – Cable should be - Per E-37

SK-14

Description of Basic Concern

The subject cable enters the confines of additional raceway. If the trays containing the subject cable were required to be wrapped, how do we make sure that the cable portion in the unlisted via is protected.

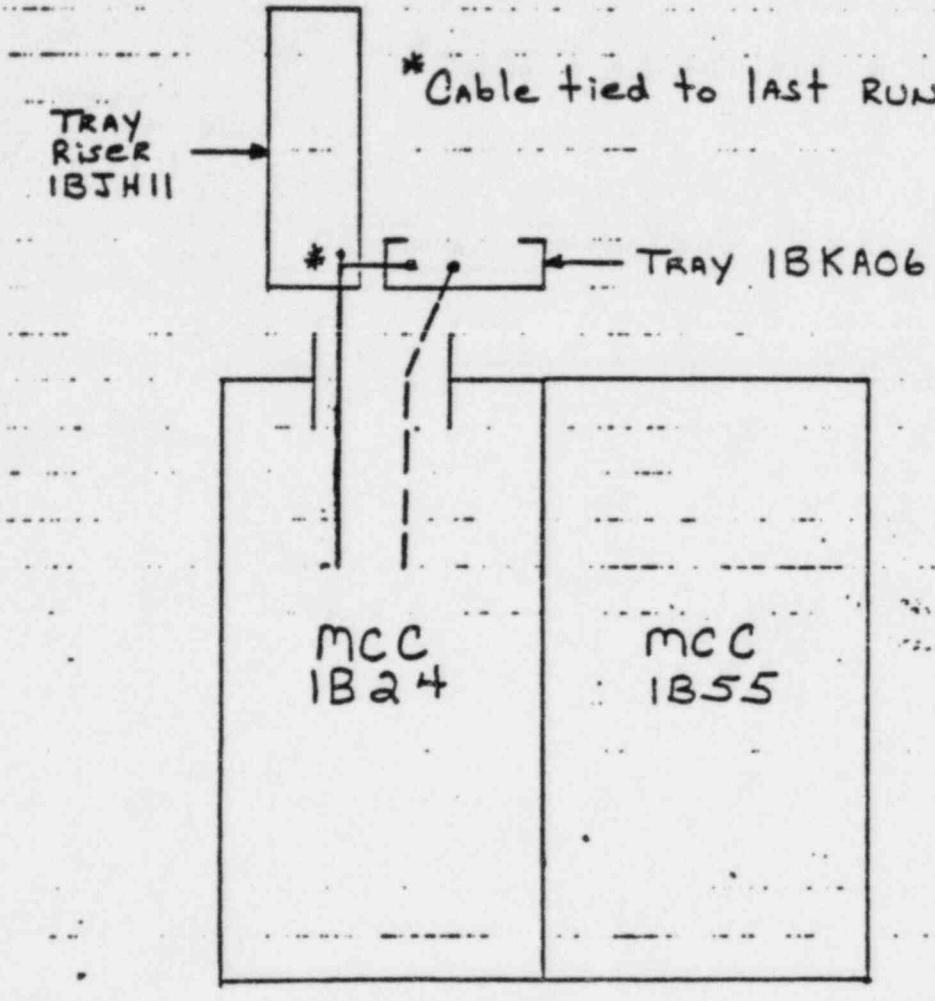
Reason for No Concern

When a cable enters the confines of additional vias, the tray wrapping criteria would require wrapping approximately 12 more inches at each end for safety.

Cable # 1BB2444 Q
Code # C-1
Construction

Sk # 15.

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cabl Installati



Actual cable route in field

Cable Route per E-37

SK-15

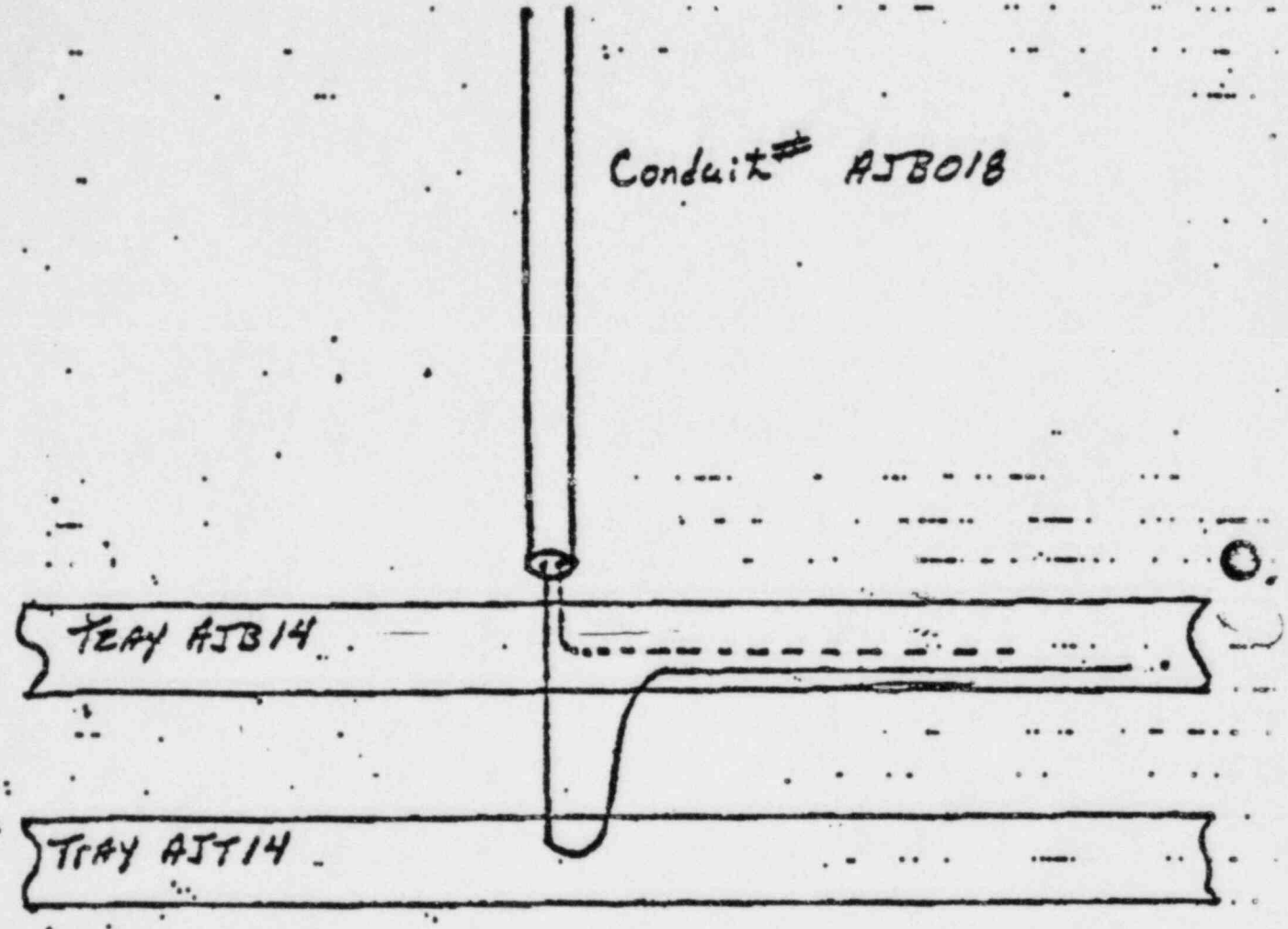
Description of Basic Concern

Cable is pulled into BJH11 which was not one of its assigned vias.

Reason for No Concern

The cable is only tied to the last rung of the riser, and will not contribute to thermal loading of the riser.

Cable #'s 1AFW021B and 1AFW082E SK-16
Code # C-1
Construction



——— Cable is routed - by field.

- - - - - - - Cable should be - PER E-37

Cables were looped out of the bottom of tray AJB14 and into conduit AJB01B so that Min. bend Radii would not be violated and for ease of cable pulling.

Condition at interim training. Q.C. to inspect final training and bundling during area walkdown.

SK-16

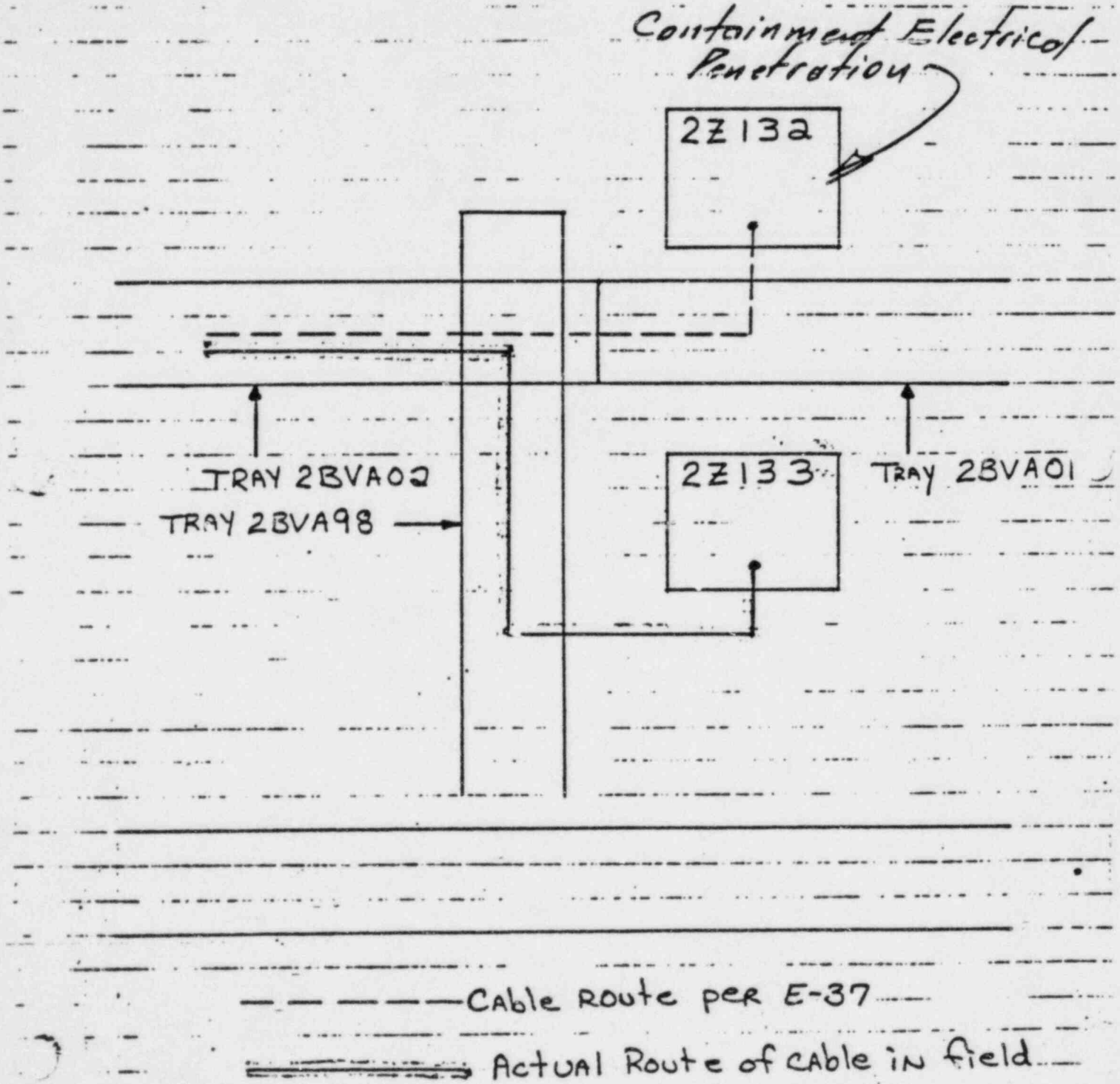
Description of Basic Concern

Cables looped out the bottom of tray AJB14 into tray AJT14.

Reason for No Concern

As a normal procedure, construction eliminates all slack from cables before tying them down. With this procedure accomplished, this concern will not be a problem.

Cable # 2BI067 A
Code # D-1
Construction



SK-17

Description of Basic Concern

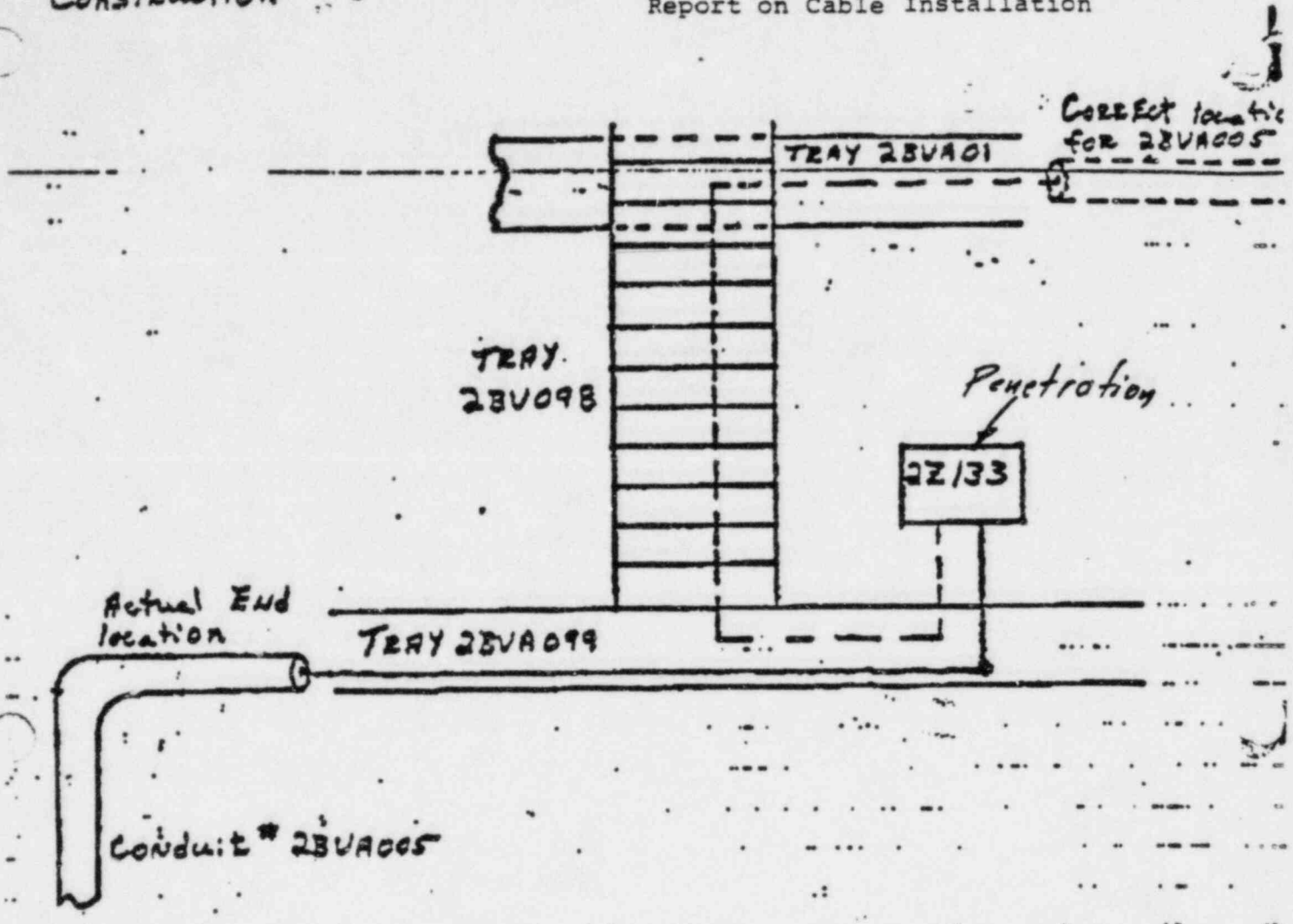
Cable is pulled to the wrong penetration.

Reason for No Concern

When construction attempts to terminate a cable at a penetration and discovers that the cable is not at the proper penetration, field engineering is notified of the problem.

Cable # 2BI004A and 2BI003A SK 18
Code # B-1
Construction #'s

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Conduit # 2BVA005 Installed at incorrect End location
Should run to 2BVA01 ± 18" into adjoining tray section
Cables Vias per E-37 are: BVA005 BVA01 BVA98 BVA99
Due to incorrect End location: BVA005 — — BVA99
——— Cable is routed - By field
- - - - - Cable Should be - Per E-37

SK-18

Description of Basic Concern

Because of incorrect conduit installation, the cable was pulled incorrectly.

Reason for No Concern

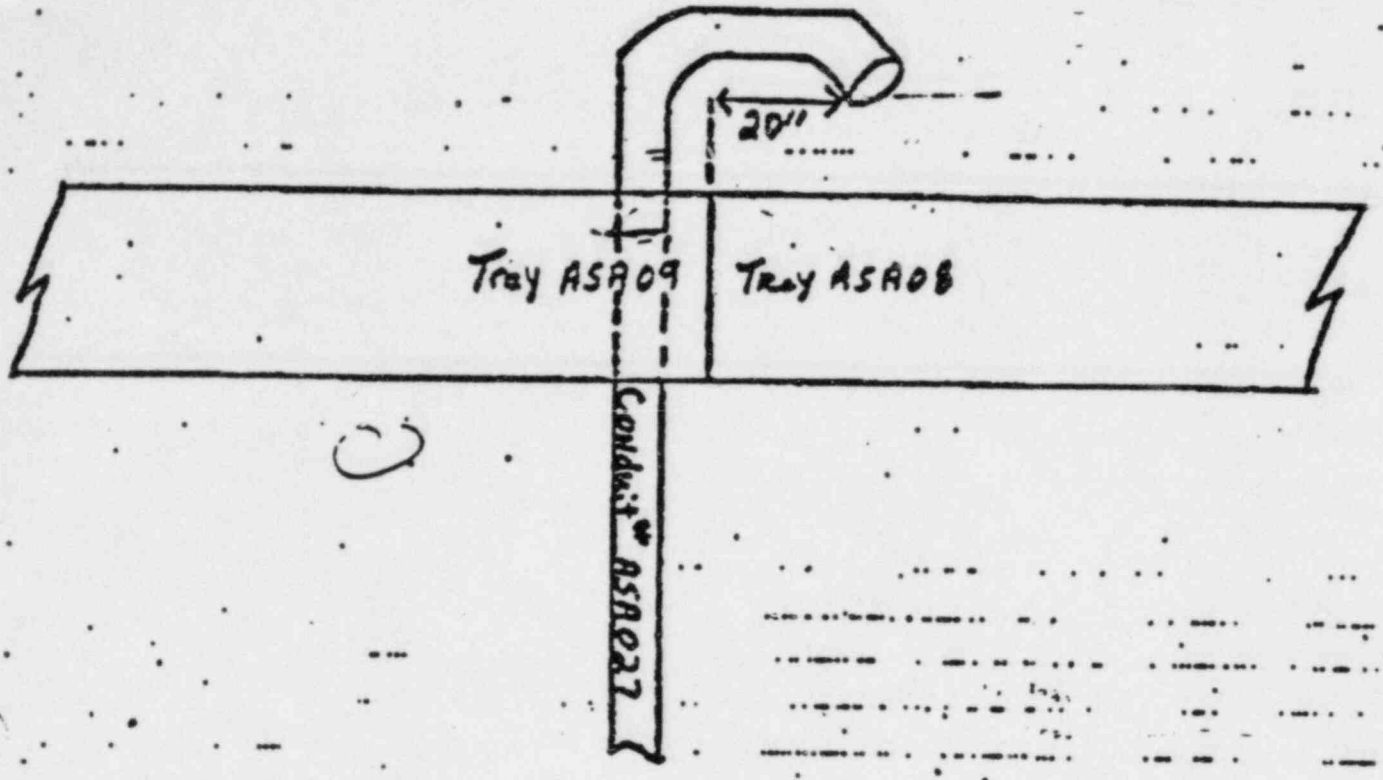
The subject conduit installation had not been inspected by quality control. On discovering the incorrect conduit installation, cable misinstallation would have been corrected.

Why? Every misinstalled cable will be caught by the QA inspector.

Cable # OAB6501N
Code # B-1
Construction

SK. 19

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



Conduit # ASA027 Installed at incorrect END location.

Should run to ASA09 ± 18" into adjoining tray section.

Cable Vias per K-37 are: ASA027 ASA09 ASA08

Due to incorrect END location: ASA027 —— ASA08

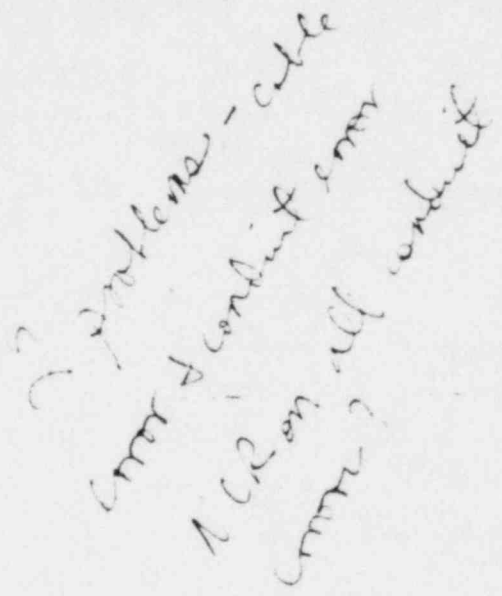
SK-19

Description of Basic Concern

Accountability; i.e., not knowing where a cable is pulled.

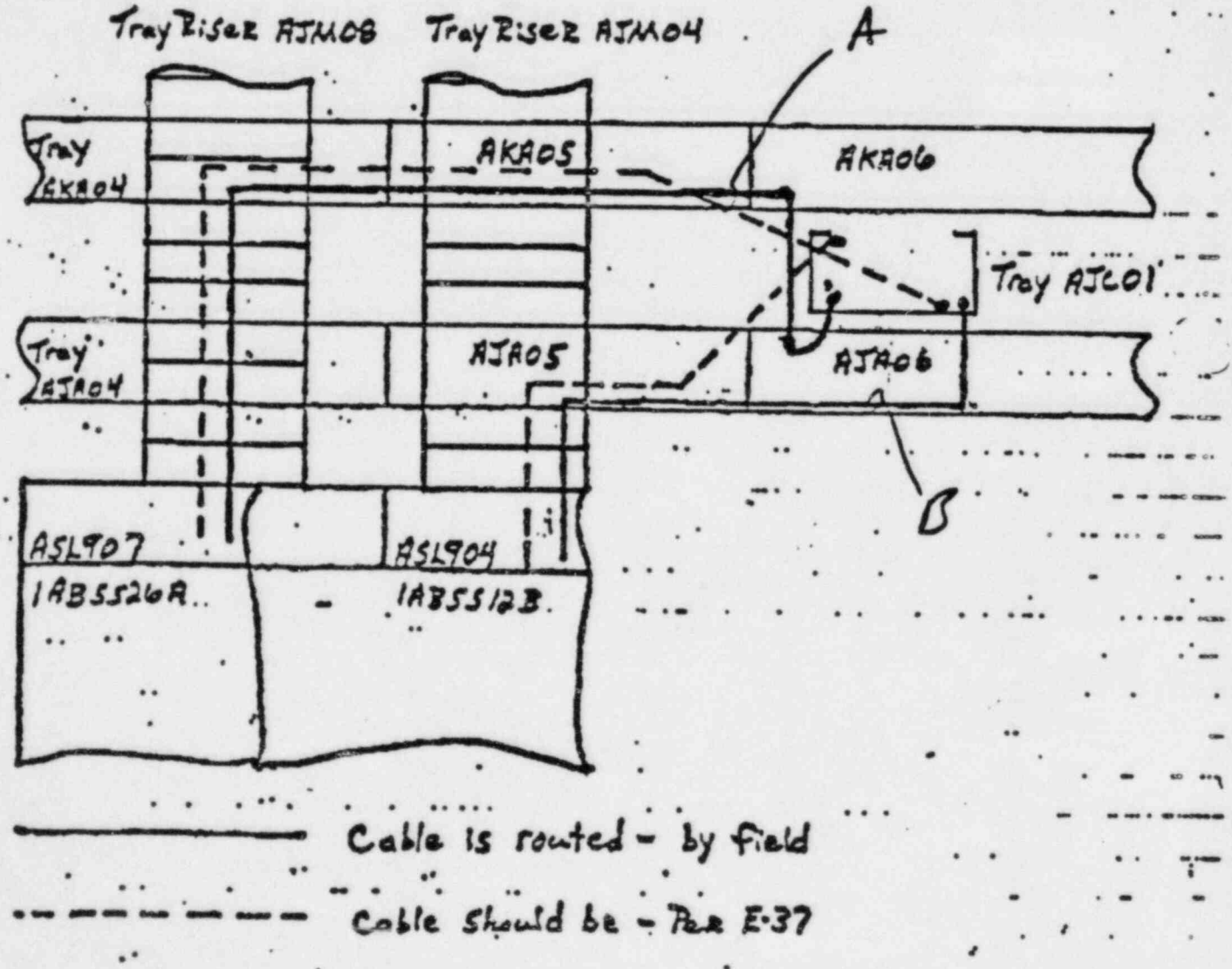
Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.



Cable = 1AB5526A and 1AB5512B
Code = D-1
Construction

SK. 20



SK-20

Description of Basic Concern

Cables were pulled into trays AKA06 and AJA06, which were listed as vias in E37, without engineering's knowledge.

Reason for Concern

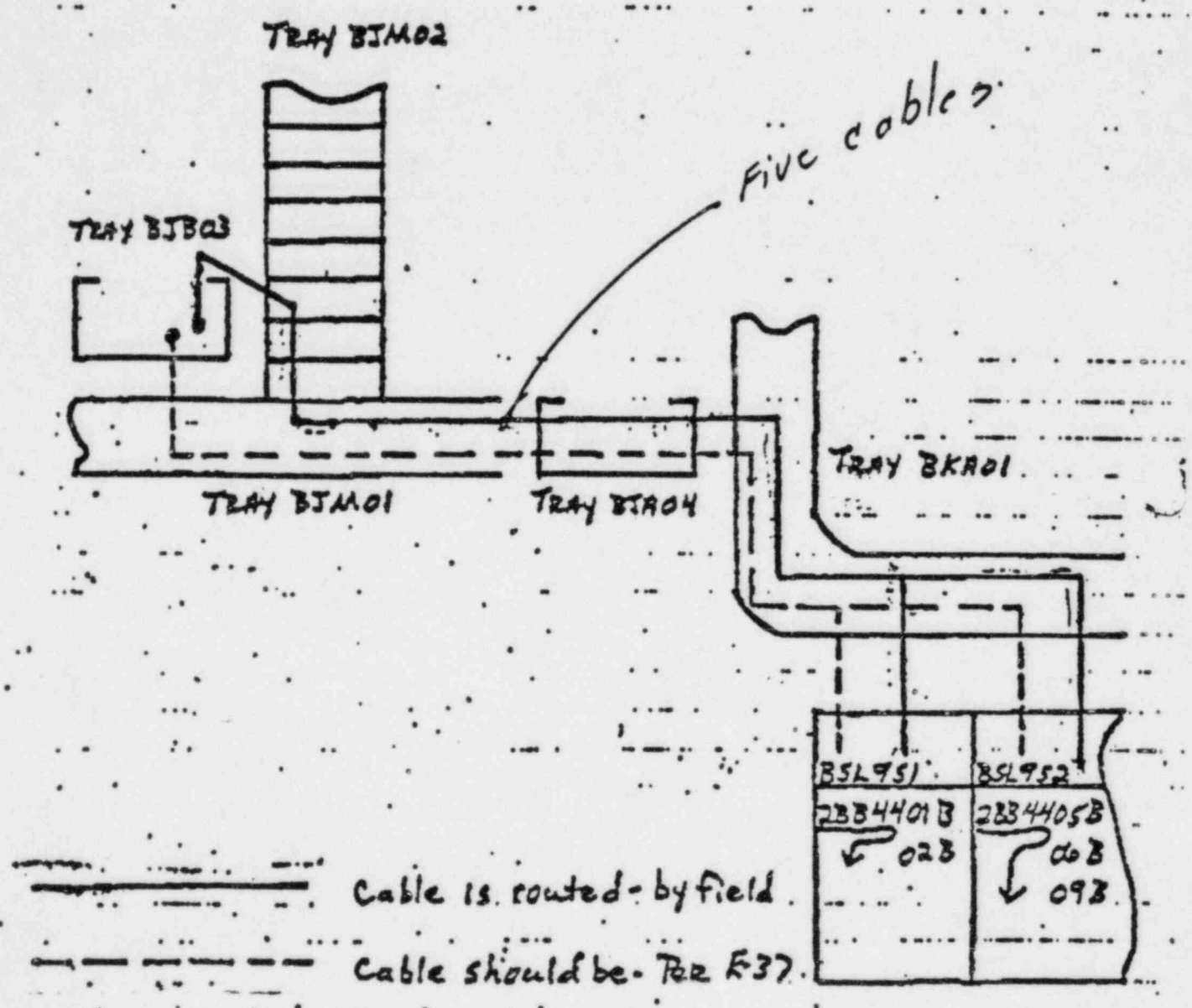
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Cable #'s 2BB4401B 02B 05B 06B 09B . SK-21
Code # D-1
Construction :

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

5



SK-21

Description of Basic Concern

Cables were pulled into tray BJM02, not in E37 vias, without engineering's knowledge.

Reason for Concern

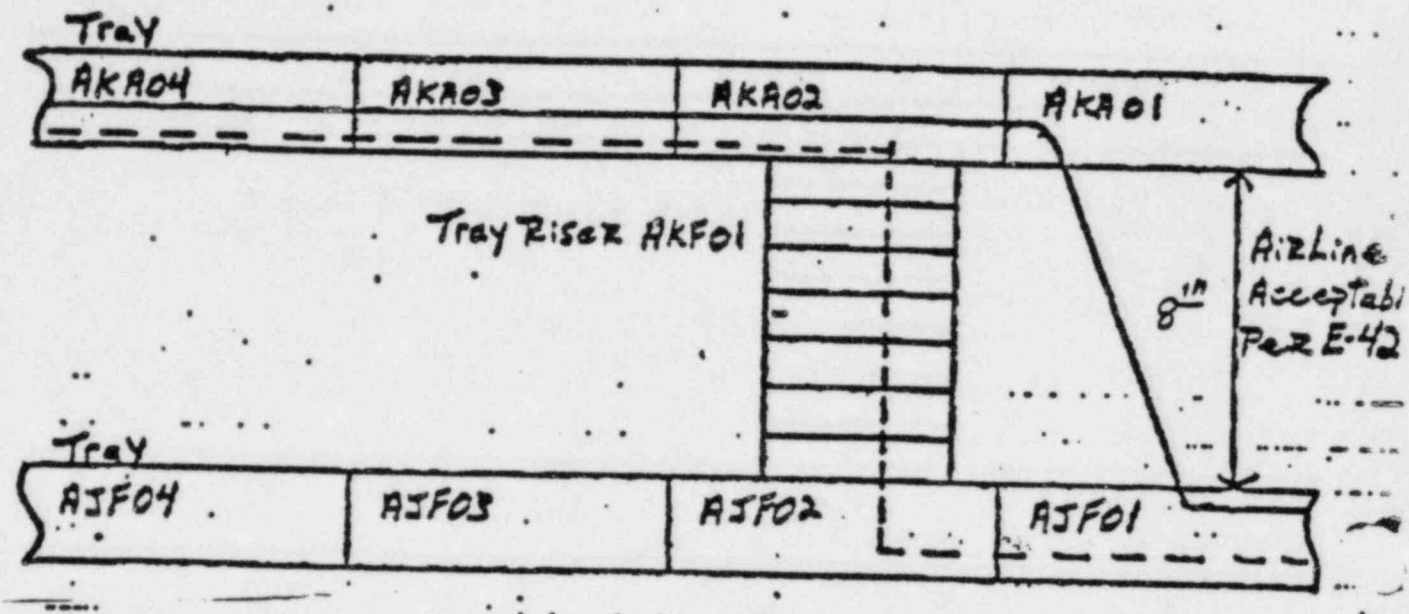
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Code = D-1
Construction

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

SK. 22



Cable is Routed - by field

Cable Should be - Per E-37

SK-22

Description of Basic Concern

Cables were pulled into tray AKA01, not in E37 vias, without engineering's knowledge.

Reason for Concern

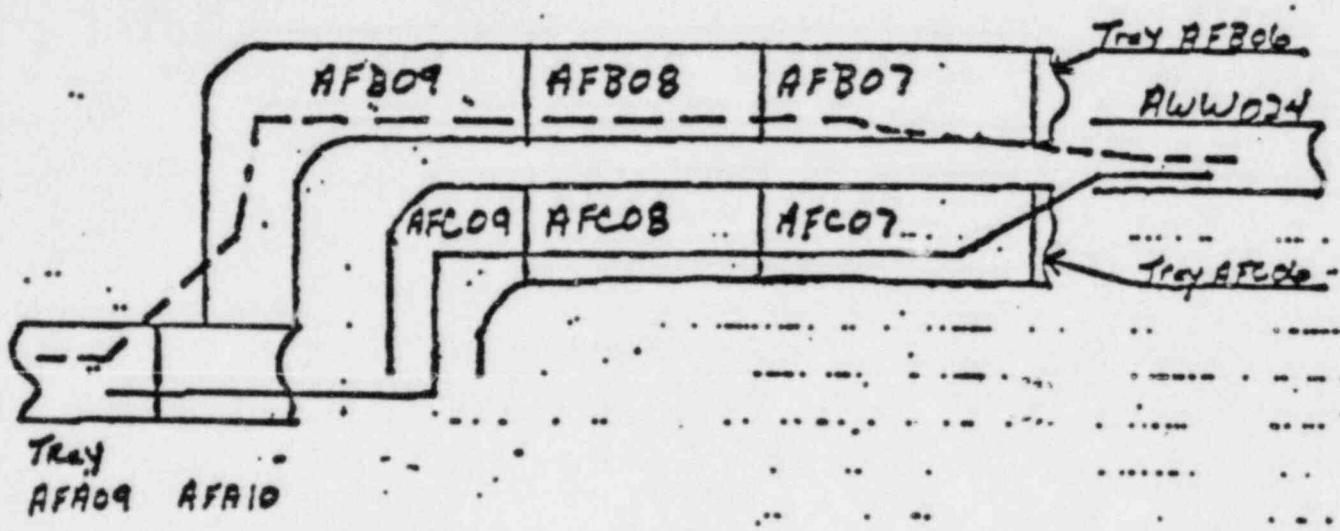
Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in that tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

Cable = OAB4511.M
Code = D-1
Construction

SK. 23

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installat



Cable is routed - by field

Cable Should be - Per E-37

SK-23

Description of Basic Concern

Cable was pulled into tray AFC07-09, not listed in E37 vias, without engineering's knowledge.

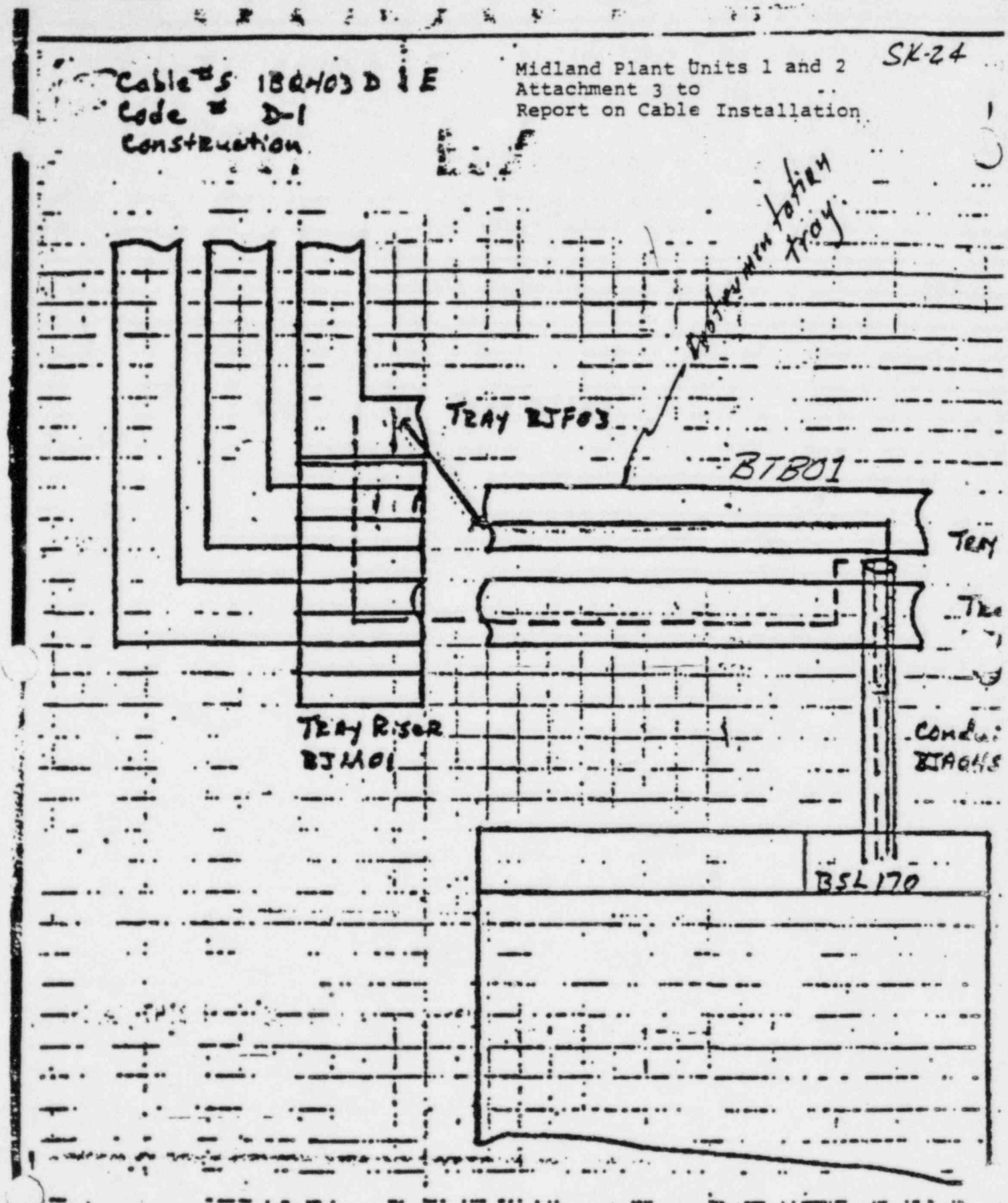
Reason for Concern

Accountability; i.e., not knowing where a cable is pulled. This problem may have an adverse affect on thermal analysis.

When a tray is wrapped, heat generated from cables in the tray must be taken into consideration. If a cable were pulled into that tray and engineering was not aware of it, the thermal analysis would not include that cable.

SK-24

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation



SK-24

Description of Basic Concern

Voltage violation - Control cables used instrumentation raceway.

Reason for No Concern

Quality control will inspect all cable transitions from one raceway to another; this inspection will eliminate this concern.

Sketch incomplete See IBG-037

Cable Tray Attached
Code = D-1
Construction & Design

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installation

SK-25

1DQ157A
1DQ290 D,F,H,L,A,T
1DQ127 E,D+E
1DQ173 D,E+F
1DQ181 B,D,F+H

DJA07
DFA08

Tray Construction
CROSS over of Seperators.
DFA08 - DJA07 @ DTA07

DTA003 DC002
DTA002 DC003
DTA 21
DTA 07
Tray Barrier
DTA

Design

Cable routed by Field
Cable Should be Per E-37

SK-25 Unique Case

Description of Basic Concern

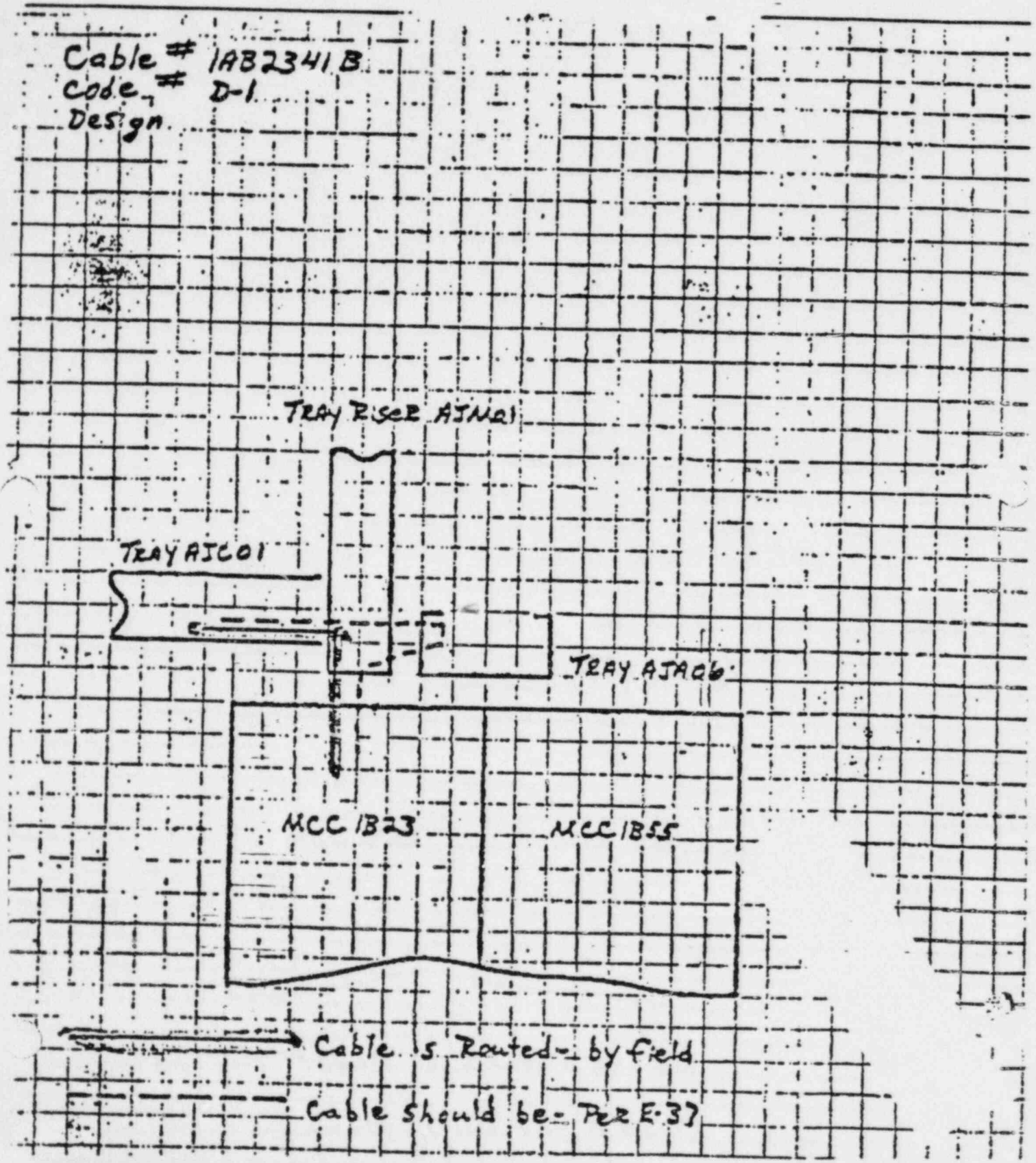
Sixteen small instrument cables were pulled into the wrong conduit.

Reason for No Concern

There is ample room in conduit DTA002/DC003 for the additional cable. There are no thermal concerns. This was a unique case because the subject conduits and cables had undergone successive renumbering and relocation after initial installation 1) to accommodate neutron detector cables and 2) because a steel beam blocked access to some of the conduit sleeves. The many changes may have caused confusion which led to the misinstallation of the cables. It is not credible that this situation would be repeated elsewhere; therefore, it constitutes a unique case.

SL-26

Midland Plant Units 1 and 2
Attachment 3 to
Report on Cable Installat.



SK-26

Description of Basic Concern

Accountability; i.e., not knowing where a cable is pulled.

Reason for No Concern

The actual cable installation did not use all the designed raceway vias. Therefore, the absence of a cable would only make thermal analysis more conservative.

(10)

Attachment D
(K-4)

August 18, 1982

MEMORANDUM FOR: James G. Keppler, Regional Administrator

FROM: Robert F. Warnick, Acting Director, Office of Special Cases

SUBJECT: CONSUMERS POWER-MIDLAND (DN 50-329; 50-330)

When you created the Office of Special Cases and a special Midland Section staffed ith individuals assigned solely to that project, you indicated your concern with the Midland Project. You did this in spite of the favorable findings of the special team inspection conducted in May, 1981, and the favorable testimony you gave before the Atomic Safety and Licensing Board on July 13, 1981. You indicated your concern was based on the Systematic Assessment of Licensee Performante (SALP) report for the period July 1, 1980 to June 30, 1981, the inspection findings since those dates, and the memo of June 21, 1982, by C. E. Norelius and R. L. Spessard suggesting certain changes be made at the Midland Project (copy attached as Enclosure 1).

At my request R. J. Cook prepared a summary of indicators of quastionable license performance at Midland. A copy of Cook's memo dated July 23, 1982 is attached as Enclosure 2.

Because of your expressed concerns, you and I met with representatives from NRR on J ly 26, 1982 to discuss Midland and Consumers Power Company (CPCo) performance. That meeting also resulted in recommended actions. A summary of the meeting is attached as Enclosure 3.

Following the meeting with NRR, I discussed the recommendations of that meeting with our Senior Resident Inspector, other members of the new Midland Section, and former Section and Branch Chiefs who are intimately familiar with Midland.

Later that week (July 30) I spent a day at the Midland site. I attended the exit meeting following Landsman's and Gardner's inspection, met with CPCo and Bechtel management to get acquainted with them, and toured the plant site.

On July 31, 1982, I expressed my opposition to the recommendations we had come u up with in the NRR meeting. My opposition was based on (1) opinions expressed by the Senior Resident Inspector, a Region III Branch Chief formerly responsible for the NRC inspection of Midland, and a Construction Section Chief who has been intimately associated with inspections of Midland regarding the proposed actions; (2) my visit to the site; and (3) the inability of Region III to articulate the problem(s) at Midland which the above referenced recommendations were supposed to solve. I indicated that we needed to better identify our concerns and the prescribe actions that would resolve these concerns.

OFFICE ▶	RIII	RIII	RIII	RIII
SURNAME ▶	Gardner	Landsman	Shafer/cg	Warnick
DATE ▶		RBK		

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY

8303210295

On August 3, 1982, members of the Midland Section met with you to discuss my opposition to the recommendations coming from the meeting with NRR. The pros and cons of the recommendations together with other alternatives were discussed. The meeting concluded with you agreeing to give the Section until August 11 to determine a better proposed course of action to resolve NRC concerns about Midland.

To this end the Midland Section met together on August 4 and again on August 5 following our public meeting with CPCo on the SALP II report. Several alternatives were discussed including stopping all work on one unit, have an independent third party monitor all past and current construction work, stopping work in selected areas, performing a construction appraisal team inspection, placing all site QC work under CPCo, and establishing an augmented NRC inspection effort.

Although some members of the Midland Section thought that stronger actions should be taken, all members of the Section agreed they could support an augmented NRC inspection effort coupled with other actions to strengthen the licensee's QC/QA organization and management. These recommended actions are attached as Enclosure 4.

It is recommended the proposed actions to improve the licensee's performance be discussed with NRR and then the licensee.

Robert F. Warnick, Acting Director
Office of Special Cases

Attachments: As stated

OFFICE ▶							
SURNAME ▶							
DATE ▶							

Encl 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

June 21, 1982

MEMORANDUM FOR: James G. Keppler, Regional Administrator

FROM: C. E. Norelius, Director, Division of Engineering and Technical Programs
R. L. Spessard, Director, Division of Project and Resident Programs

SUBJECT: SUGGESTED CHANGES FOR THE MIDLAND PROJECT

Historically, the Midland Project has had periods of questionable quality assurance as related to construction activities and has had commensurate regulatory attention in the form of special inspections, special meetings, and orders. These problems have been given higher public visibility than most other construction sites in Region III. As questions arise regarding the adequacy of construction or the assurance of adequate construction, we are faced with determining what regulatory action we should take. We are again faced with such a situation.

Current Problem

The current problem was caused by a major breakdown in the adequacy of soils work during the late 1970's. Because of the increased regulatory attention given the site, we expect that exceptional attention would be given to this activity and that licensee performance would be better than other sites or areas which have not had such significant problems and therefore have not attracted this level of regulatory attention. However, that does not appear to be the case and Midland seems to continually have more than its share of regulatory problems. The following are some of the specific items which are troublesome to the staff.

Technical Issues

1. In the remedial soils area, the licensee has conducted safety related activities in an inadequate manner in several instances - removal of dirt around safety related structures, pulling of electrical cable, drilling into safety related utilities.

8303210282

2. In the electrical area, in trying to resolve a problem of the adequacy of selected QC inspectors' work conducted in 1980, the licensee completed only part of the reinspection even when problems were identified, and appears inclined to accept that 5% of electrical cables may be misrouted (their characterization of "misrouting" may imply greater significance than we would attach to similar findings).

3. In the pipe support area, in trying to resolve a problem of the adequacy of QC inspections conducted in 1980, the licensee has portrayed only a small percentage of defects of "characteristics" identified and has not addressed the findings in terms of a large percentage of snubbers which may be defective because of the characteristics within each snubber that may be defective (e.g., if only one characteristic was defective out of 50 reviewed on a single hanger, the percentage is small; but if the one defective characteristic makes the hanger defective the result would have a much greater significance level). The licensee had done a detailed statistical analysis in an attempt to show that the small percentage of characteristics were found rather than broadly approaching the problem with significant reinspections to determine whether or not construction was adequate.

Communications

Multiple misunderstandings, meetings, discussions, and communications seem to result in dealing with the Midland Project. Some examples are:

1. NRC staff attending a meeting in Washington on March 10, 1982, heard the Consumers Power Company staff say that electrical cable pulling related to soils remedial work was completed. It was determined to be ongoing the next day at the site.

2. When Region III attempted to issue a Confirmatory Action Letter, J. Cook informed W. Little of his understanding that both J. Keppler and H. Denton had agreed that the subject of the CAL was not a safety related item subject to NRC regulatory jurisdiction. Such agreements had not in fact occurred and following a meeting, Consumers Power Company issued their commitments in a letter to Region III.

3. In reviewing a licensee May 10, 1982 letter, responding to the Board Order, the NRR staff had an unsigned letter and Region III had a signed copy both dated the same date but differing in content.

4. Recently a Region III inspector in closing out and exiting from his inspection described the exit meeting as being the most hostile he had ever participated in.

5. The responses to any Region III enforcement letters issued to Midland are more lengthy and ~~are~~ argumentative than are any other responses from any other licensee in Region III. This point was made in the SALP response provided by Midland, and the SALP response in itself from Midland is an example of the type of response which we commonly receive from the site. The length of the response is at least as long as the initial SALP report.

6. Multiple requests for briefing meetings and other statements by the utility to the effect that we should review procedures in developmental stages imply that Midland wants the NRC to be a part of their construction program rather than having us perform our normal regulatory function.

Staff Observations

1. With regard to corrective actions of identified noncompliances, the Midland response seems to lean towards doing a partial job and then writing up a detailed study to explain why what they have done is sufficient rather than doing a more complete job and assuring 100% corrective action has occurred. In the detailed writeups that are prepared, it is the staff's view that the licensee does not always represent the significance properly, and the analyses and studies often raise more questions than they solve; thus time appears to have been wasted in writing an analysis rather than in fixing the problem.

2. Midland site appears to be overly conscious with regard to whether or not something is an item of noncompliance and spends a lot of effort on defending whether or not something should be noncompliance as opposed to focussing on the issue being identified and taking corrective action. This appears in part to be due to their sensitivity of what appears in the public record as official items of noncompliance. This sensitivity may have resulted from the extended public visibility which has attended construction of the facility. The staff's view is that the Midland site would look better from the public standpoint and be more defendable from NRC's standpoint, if they concentrated on fixing identified problems rather than arguing as to the validity of citations. This type of view was expressed by the utility during a recent effort to clarify in detail that certain construction items on the soils remedial work should not be subject to NRC's regulatory action.

3. The Midland project is one of the most complex and complicated ever undertaken within Region III. The reason is that they are building two units of the site simultaneously and additionally have an underpinning construction effort which in itself is probably the equivalent of building a third reactor site. The massive construction effort and the various stages of construction activity which are involved make the site extremely complicated to manage. This activity appears to cause a lot of pressure on the licensee management.

4. Mr. J. Cook, the Vice President responsible for the Midland site is an extremely capable and dynamic individual. However, these characteristics in conjunction with the complexity and immenseness of operation as set forth in 3, above, may actually be contributing to some of the confusion which seems to exist. The staff views that (1) he is too much involved in detail of plant operations and there are times when the working level staff appears to agree and be ready to take action where Mr. Cook may argue details as to the necessity for such action or may argue as to the specific meaning of detailed work procedures, (2) this kind of push may lead to such things as letters both signed and unsigned appearing in NRR and causing confusion, (3) this push may lead to some animosity at the licensee's staff level if NRC activities are looked on as slowing progress of construction at the site.

Recommendations

It appears essential that some action be taken by NRC to improve the regulatory performance of the Midland facility. The following specific suggestions are made.

1. The company must be made aware and have emphasized to them again that their focus should be on correcting identified problems in a complete and timely manner.

2. We should question whether or not it is possible to adequately manage a construction program which is as complex and diverse as that which currently exists at Midland. We would suggest specifically that the following activities be considered:

   a. That the licensee cut back work and dedicate their efforts to getting one of the units on line in conjunction with doing the soils remedial work.

   b. That they have a separate management group all the way to a possible new Vice President level, one of which would manage the construction of the reactor to get it operational and the second to look solely after the remedial soils and underpinning activities.

3. Consumers Power Company should develop a design and construction verification program by an independent contractor. This would provide an important additional measure of credibility to the design and construction adequacy of the Midland facility.

We would be happy to discuss this with you.

C. E. Norelius, Director
Division of Engineering and
Technical Programs

R. L. Spessard, Director
Division of Project and
Resident Programs