

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-329/82-22; 50-330/82-22

Docket No. 50-329; 50-330

License 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: October 12 - November 25, 1982 and January 19-21, 1983

Inspectors: *W Shafer for* P. A. Barrett 2-1-83  
*W Shafer for* B. L. Burgess 2-1-83  
*W Shafer* R. J. Cook 2-1-83  
*R.N. Gardner* R. N. Gardner 2/1/83  
*R.B. Landsman* R. B. Landsman 2-1-83  
Approved by: *W.D. Shafer* W. D. Shafer, Chief 2-1-83  
Section 2, Office of  
Special Cases

Inspection Summary

Inspection on October 12 - November 25, 1982 and January 19-21, 1983 (Report No. 50-329/82-22; 50-330/82-22)

Areas Inspected: Licensee actions on previously identified items; special inspection involving electrical, mechanical and civil components of the Diesel Generator Building; control of concrete chipping; control of electrical cable segregation; review of Remedial Soils requalification activities; perimeter dike armor stone activities; prestartup test; ultrasonic testing of hold down bolts. The inspection involved a total of 594 inspector-hours onsite by five NRC inspectors including 72 inspector-hours onsite during off-shifts.

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Results: Of the areas inspected, no apparent items of noncompliance or deviations were identified in four areas. Noncompliances identified in the remaining areas were as follows:

<u>Noncompliance</u>	<u>Report Section</u>
Criterion III - Failure to establish adequate design control measures	7.a, 8.a, 9, 10.c.(1), 10.c.(4), 25
Criterion V - Failure to develop adequate procedures and failure to accomplish activities affecting quality in accordance with instructions, procedures or drawings	3.a, 4.a(4), 4.b, 4.c, 6.a, 6.b, 7.b.(1), 7.b.(2), 10.a, 10.b, 10.c.(2), 10.c.(3), 17
Criterion VI - Failure to establish measures to control the issuance of documents, including changes	12
Criterion VII - Failure to conduct adequate component source inspections and receipt inspections	2.b
Criterion IX - Failure to establish measures to control special processes	8.b
Criterion X - Failure to establish an inspection program and failure of QC inspections to identify nonconformances	10.a, 18
Criterion XIII - Failure to establish measures to maintain and control the cleaning and preservation of equipment	7.b.(3)
Criterion XV - Failure to establish measures to control nonconforming materials, parts, or components	5, 8.a, 9, 14.b

## DETAILS

### Persons Contacted

#### Consumers Power Company

J. W. Cook, Vice President  
R. Welles, Executive Manager  
D. B. Miller, Site Manager  
M. L. Curland, QA Superintendent  
R. L. Akers, MPQAD  
J. G. Balazer, Construction Engineer  
E. M. Evans, Construction Engineer  
L. R. Howell, MPQAD  
D. D. Johnson, Construction Engineer  
E. Jones, MPQAD  
G. B. Johnson, Construction Engineer  
J. S. Kreple, Construction Engineer  
G. M. Murray, Construction Engineer  
B. H. Peck, Construction Engineer  
D. W. Puhalla, Construction Engineer  
G. W. Rowe, Construction Engineer  
M. J. Schaeffer, MPQAD  
D. E. Sibbald, Construction Engineer  
T. A. Spelman, Construction Engineer  
D. J. Vokal, Construction Engineer  
R. M. Wheeler, Construction Engineer  
R. H. Wieland, Construction Engineer  
J. T. Walton, Construction Engineer  
R. E. Whitaker, Construction Engineer

#### Bechtel Power Company

H. Wahl, Vice President and General Manager  
K. Vassar, Manager, Division of Project Operations and Services  
J. Rutgers, Project Manager  
L. Davis, Site Manager  
M. A. Dietrich, MPQAD  
P. Corcoran, Resident Project Engineer  
J. J. Gilmartin, Field Engineer  
B. R. Kappel, Resident Engineer  
F. H. Schulmeister, MPQAD  
E. Smith, PFQCE

Other licensee and contractor personnel were routinely contacted during the course of the inspection.

#### 1. Licensee Actions on Previously Identified Items

(Closed) Deviation (50-329/82-11-01; 50-330/82-11-01): The licensee failed to use approved installation/coordination forms during the

installation of affected underpinning instrumentation. As documented in Inspection Report No. 50-329/82-18; 50-330/82-18, the inspector verified that the licensee was properly documenting the installation of underpinning instrumentation on attached installation/coordination forms. During this inspection the inspector reviewed Bechtel Power Corporation Procedure FPU-1.000, Revision 0, which delineated procedures for the preparation, approval, and use of the subject installation/coordination forms. The inspector determined that the Bechtel procedure was acceptable.

Functional or Program Areas Inspected

2. Electrical Cable Terminations

An inspection of completed Class 1E cable terminations in Diesel Engine Control Panels 1C111, 1C112, and in Diesel Generator Control Panel 1C231 was conducted. During this inspection internal wiring terminations and field terminations were observed. The internal wiring terminations were accomplished by the panel supplier during the manufacture of the panels while the field terminations were accomplished by onsite Bechtel electricians.

a. The following field terminations were observed:

<u>Cable Scheme Number</u>	<u>Location of Termination</u>
1AA0502M	1C231
1AA0502R	1C231
1AD1201A	1C231
1AG1101B	1C231
1AG1101C	1C231
1AG1101F	1C231
1AG1102N	1C231
1AG1105B	1C231
1AG1105C	1C111
1AG1113C	1C111
1AA0001L	1C111
1AA0502G	1C111
1AB5311K	1C111
1AD1115A	1C111
1AG1102G	1C111
1AG1102K	1C111
1AG1102L	1C111
1AG1102M	1C111
1AG1102N	1C111
1AG1105C	1C111
1AG1108C	1C111
1AG1108F	1C111
1AG1109B	1C111
1AG1109C	1C111
1AV099E	1C111
1AV100E	1C111

The inspector verified that the above field terminations met the requirements of Bechtel Termination Procedure FPE-7.000 including the use of proper termination lugs and connection to the correct termination board locations.

- b. The inspector observed the termination of internal wiring in Diesel Engine Control Panel 1C112. The inspection revealed numerous instances where the internal conductors within the panels were damaged or were not properly terminated. Examples included:
- (1) The output lead on the Relay Tach device had numerous broken conductors at the termination lug.
  - (2) The K1 lead on the Relay Tach device had two broken strands resulting in a potential short circuit between the K1 lead and an adjacent conductor.
  - (3) The 1- lead on the CB-1 device did not have all strands inserted into the compression lug.

The above conditions were contrary to the procurement requirements delineated in Specification 7220-G-5, Revision 1, Paragraph 6.0 which stated, in part, "All electrical wiring . . . within the board enclosure shall conform to the highest industrial standards of design and workmanship." This failure of source inspections at the panel supplier facilities and receipt inspections at the Midland site to assure conformance of the internal wiring to procurement requirements was considered an item of noncompliance with 10 CFR 50 Appendix B, Criterion VII as described in the Notice of Violation. (50-329/82-22-01; 50-330/82-22-01)

Subsequent to this finding the licensee initiated NCR No. M01-9-2-139 which contained 19 pages of identified internal wiring deficiencies associated with Diesel Engine Control Panels 1C111, 1C112, 2C111 and 2C112. The licensee on December 3, 1982 identified the poor workmanship within the subject panels as part of a potential 50.55(e) report on Vendor supplied electrical equipment.

- c. The inspector determined that the internal wiring within the Diesel Generator Control Panels was not installed in accordance with the separation requirements delineated in the Midland FSAR. Nonclass 1E wiring was routed within six inches of Class 1E wiring and the color coding of the internal wiring did not correctly identify the wiring as being Class 1E or Nonclass 1E. Subsequent to this finding the inspector reviewed Consumers Power Company (CPCo) NCR No. M-01-9-1-075 dated June 19, 1981. This NCR was written by the licensee to document the aforementioned internal wiring separation deficiencies. The NCR stated that the panel supplier was sending a representative to the Midland site on November 15, 1982.

On November 18, 1982 the licensee informed the inspector that panel supplier representatives had arrived onsite on November 16, 1982

and that these representatives had determined that the panels would be modified to correct the internal wiring separation problems. The inspector had no further questions on this matter.

### 3. Diesel Control Panel Installations

The inspector observed the installation of the Diesel Generator Control Panel and the Diesel Engine Control Panel associated with each of the four diesel generators. The installation requirements for these panels were delineated on Drawings 7220-M18-83 and 7220-M18-250. During this inspection the following was observed:

- a. The Diesel Engine Control Panels were not installed in accordance with foundation Drawing 7220-M18-250. This drawing required the installation of bevelled washers and flat washers on the foundation bolts. The flat washers were not installed on any of the four panels. In addition, there was no evidence that the bevelled washers were installed before the panels were grouted. This failure to install foundation washers as required by the pertinent foundation drawing was considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion V as described in the Notice of Violation. (50-329/82-22-02A ; 50-330/82-22-02A)

Subsequent to this finding the licensee initiated NCR No. M01-9-2-138 to document the missing washers.

- b. The Diesel Generator Control Panel base to cabinet hardware installation was not in accordance with Drawing 7220-M18-83. The drawing required that the cabinet be secured to the base utilizing 1/2" hex bolts with threads embedded 2" into concrete. The licensee had installed nuts on the 1/2" hex bolts which were not identified on the subject drawing. In addition, the concrete curb had not been poured at the time of this inspection. The inspector further observed that the drawing details did not clearly describe the base to cabinet hardware configuration. Discussions with the licensee revealed that the incomplete cabinet foundation was documented on an In Process Inspection Notice (IPIN), dated June 14, 1982. On September 21, 1982, the licensee had initiated Field Change Request (FCR) M-6655 which proposed a change to the cabinet to foundation detail located on drawing 7220-M18-83. The inspector had no further questions on this matter.

### 4. Raceway Support Installations

- a. The inspector observed the as-built installation of the type 13 conduit support for conduits 2BN006, 2BN007 and 2BDA002 located in Bay 4 of the Diesel Generator Building. The as-built installation of the support was compared with the requirements delineated on Drawing E-42. During the inspection of this support the following was determined:

- (1) The lengths of the support members were determined to be within the tolerances identified on Drawing E-42.
  - (2) The base plate dimensions were in accordance with the drawing requirements.
  - (3) The support welds were acceptable.
  - (4) The size of the unscheduled pull box mounted on the conduit support did not conform to Sheet 42 of Drawing E-42. The as-built dimensions of the box were determined to be 12" x 12" x 6". The dimensions required by Sheet 42 were 13 1/2" x 12" x 6". This failure to install the correct size unscheduled pull box was a further example of noncompliance as cited in paragraph 3.a above. (50-329/82-22-02B; 50-330/82-22-02B)
- b. The inspector observed the as-built installation of tray support FSK-E-796, Sh 1-86 installed in Bay 4 of the Diesel Generator Building. The as-built configuration of the support and the as-built support dimensions were compared with the requirements identified on Drawing E-796(Q), Revision 5, Sheet 2 of 2. This inspection revealed that the as-built 2' 1 1/2" wall to support dimension did not conform to the 1' 10" dimension required by the aforementioned drawing. The failure to install the subject support in accordance with the drawing requirements was a further example of noncompliance as cited in paragraph 3.a above. (50-329/82-22-02C; 50-330/82-22-02C)
- c. An inspection of the as-built installation of tray support No. 14 installed in Bay 2G11 of the Diesel Generator Building was conducted. The as-built configuration of the support and the as-built support dimensions were compared with the requirements identified on Drawing E-796(Q), Revision 11, Sheet 1 of 2. This inspection revealed that the as-built 5' 5" wall to support dimension did not conform to the 6' 6" dimension required by the aforementioned drawing. The failure to install the subject support in accordance with the drawing requirements was a further example of noncompliance as cited in paragraph 3.a above. (50-329/82-22-02D; 50-330/82-22-02D)
- d. The licensee was questioned as to the status of the seismic analysis performed to provide assurance that the plant conduit and tray supports, as installed, met the seismic requirements for the Midland plant. The licensee stated that the seismic analysis was being accomplished at this time and that the results of the analysis would be available when completed. This matter will remain open until the inspector has reviewed the data relating to the seismic analysis. (50-329/82 22-03; 50-330/82-22-03)

##### 5. Review of Quality Control Activities

During the review of Bechtel Quality Control (QC) inspection activities the inspector determined that Bechtel QC inspectors were not identifying as nonconformances all of the deficiencies which they observed during

their inspections. The QC inspectors were instructed to suspend an inspection if an excessive number of deficiencies were observed. In Process Inspection Notices (IPINs) were QC documents utilized by QC inspectors to record nonconformances observed during in process inspections and during inspections of completed items. IPINs associated with suspended inspections identified as nonconformances only a portion of the observed deficiencies. No record was made of the remaining observed deficiencies. In addition, the IPINs did not document the fact that the inspection was suspended due to excessive deficiencies having been observed. Finally, the criteria to be used by QC inspectors in determining whether observed deficiencies were excessive was not defined. As a result of the above, the following was determined:

- a. Trend analysis, as identified in Midland Project Quality Assurance Department Procedure M-2, was designed to serve as a management tool to detect changes in the rates of nonconformance. For deteriorations in quality the procedure required the performance of an in-depth analysis to determine the root cause of nonconformance. The failure of QC inspectors to document all observed nonconformances resulted in the Trend Analysis Program, as it relates to IPINs, not addressing all nonconformances. Management's ability to determine the root cause of nonconformance so as to prevent recurrence had been accordingly diminished.
- b. An additional function of the in-depth analysis required by Trend Analysis Procedure M-2 was the determination as to whether or not work affected by nonconformance should be stopped. The failure of QC inspectors to document all observed nonconformances resulted in the continuation of nonconforming work activities which received no stop work considerations, thereby preventing management from performing an indepth analysis.
- c. On January 19 and 20, 1983, thirteen Bechtel Quality Control (QC) inspectors were interviewed by members of the Midland Section to determine the standard practice used by onsite QC inspectors in closing open Inspection Reports (IR's) which had open IPIN's. Of the thirteen QC inspectors interviewed, eight inspectors stated that open IR's would be closed after the deficiencies listed on the open IPIN's had been reinspected and the IPIN closed. Four of these eight QC inspectors stated that spot checks would be performed in the same area as the identified deficiencies. Three of the inspectors stated that they had written partial IPIN's. The results of the interview can be summarized as follows:
  - (1) There was no standard practice pertaining to the use of IPIN's in documenting deficiencies. Some inspectors were involved in writing IPIN's which did not document all identified deficiencies while some inspectors believed that all inspectors were required to document all deficiencies.

- (2) There was no standard practice pertaining to the closure of open IAs which had open IPIN's. Some inspectors would reinspect only the deficiencies identified on the associated IPIN while some inspectors would reinspect everything pertaining to the IR attribute against which the IPIN had been written.

The failure to establish measures to control materials, parts, or components which did not conform to requirements in order to prevent their inadvertent use or installation was considered an item of noncompliance with 10 CFR 50, Appendix B, Criteria XV and X as described in the Notice of Violation. (50-329/82-22-04; 50-330/82-22-04)

During the inspection a determination was made that the licensee had in the past used another unofficial document to bypass the IPIN program. The unofficial document (called Attachment 10) was used by QC inspectors to identify numerous nonconformances such as equipment not installed, work not completed, and drawings not updated. These nonconforming issues were not factored into the Trend Analysis Program and subsequently were not reviewed for generic implications or root cause so as to prevent recurrence.

The licensee's QA Audit M-01-333-2, finding 14F, addressed a problem regarding incomplete work being turned over to QC inspectors, but did not address the use of Attachment 10 forms. Discussion revealed that the auditors had met with QC representatives and had obtained prompt corrective action (i.e., the cessation of documenting nonconformances on unofficial documents) and as a result the auditor did not document this issue as an audit finding.

However, it is not clear that the deficiencies identified on unofficial documents were subsequently reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures. This matter is unresolved pending the determination of the adequacy of the licensee's corrective actions in regards to these deficiencies. (50-329/82-22-27; 50-330/82-22-27)

#### 6. Examination of Steel in Laydown Area

- a. During the inspection, the laydown area was examined by the inspectors. It was noted that there was stock steel with no markings which would identify the material to a given material heat number. Bechtel Field Instruction FIG-9.600, Color Coding of Field Purchased Pipe, Fittings, Bolting Material, Non-Q Hangers, Stock Steel, and Component Parts, states that "No marking is required for A-36 plate, shapes, and bars or A-500 Tube Steel for Non-ASME, Q-listed Steel." This same specification required that stock steel other than A-36 and A-500 Tube Steel be marked with the material type and grade. High strength steel plate was identified in the laydown area without markings of material type and grade. Failure to not mark high strength steel with the material type and grade was considered an item of noncompliance against 10 CFR 50, Appendix B, Criterion V and described in the Notice of Violation. (50-329/82-22-05A; 50-330-82-22-05A)

- b. Field Instruction FIG-9.600, referenced above, required that the ends of all Non-Q steel material be painted yellow with separate storage provided. During the examination of steel in the laydown area, it was noted that there were Q and non-Q storage areas. However, some steel stock in the Q area was painted on the ends with a paint color resembling faded yellow paint and some of the steel in the non-Q area did not have the yellow paint marking. The licensee stated that the yellow-like color paint noted in the Q storage area had been placed on the material by the manufacturer. The licensee painted the ends of all the material in the non-Q area after this was identified by the inspectors. Failure to mark and/or segregate Q and non-Q material was considered an item of noncompliance with 10 CFR 50 Appendix B, Criterion V as described in the Notice of Violation. (50-329/82-22-05B; 50-329/82-22-05B)
- c. The references above to Field Instruction FIG-9.600 pertain to Revision 1 of this instruction, dated December 2, 1981. Revision 1 superceded Revision 0 which was dated February 1979. Revision 0 referred only to field purchased pipe, fittings and bolting material and made no reference to stock steel identification. The inspectors identified (in the laydown area) a nominal 25 foot length of 12 x 12 WF beam that had no markings but was stored in an area that had ASTM-A-588 steel of similar description and surface color/texture appearance to the unmarked beam. The ability of the licensee to maintain material traceability and identification in accordance with the regulations was considered an unresolved item. (50-329/82-22-06; 50-330/82-22-06)
- d. The inspector requested to see QA audits of material traceability. The only audits that could be located during the inspection were of receiving and fabrication of miscellaneous structural steel. No audits of material traceability could be located during this inspection. Subsequent communications with the licensee revealed that an audit had been conducted in September 1982 (M01-332-2). Pending review of this audit, this is an unresolved item. (50-329/82-22-07; 50-330/82-22-07)

7. Diesel Generator Muffler Inspection

The inspectors conducted an inspection of the diesel generator muffler located in the Diesel Generator Building. The inspection included a review of the applicable drawings and documentation associated with installation and modification of the four diesel generator (DG) mufflers.

The DG mufflers were constructed offsite by American Air Filter Co., Inc. (a subcontractor of Transamerica Delaval, the DG system supplier), and installed onsite by Bechtel Power Company (BPCo). After onsite receipt inspection and when construction permitted, the mufflers were installed in their respective rooms in the DG Building. During installation of the mufflers, it was noted that the saddle support baseplate holes and slots would not match anchor bolt locations. FCR M-2283 was written to modify the saddle support base plates to fit the anchor bolt locations.

- a. During the inspection the licensee was requested to review documentation of the base plates to determine if traceability was evident. The licensee's review of base plate documentation identified that part numbers could be tracked to a Certificate of Conformance. The Certificate of Conformance was written for purchased "Q" material that was not manufactured to ASME code specifications. The Certificate of Conformance, did not, however, specify the material used during the manufacture of the base plates. The inspector and the licensee reviewed the base plate and muffler saddle support drawings and specifications for identification of plate material. Muffler and saddle support material was not specified on the design drawings and specifications.

FSAR Section 3.2 Table 3.2-1 identifies the Diesel Generator Combustion Air Intake and Exhaust System as Seismic Category 1. To qualify the muffler to Seismic Category 1 criteria the saddle supports and base plate material requirements must be specified to ensure that the muffler would meet seismic criteria.

10 CFR 50 Appendix B, Criterion III requires measures to be established for the selection and review for suitability of application of materials that are essential to the safety related functions of the structures, systems, and components.

The failure of design documents to specify requirements for the selection and review for suitability of application (in this case Seismic Category 1) of materials associated with the DG muffler was considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion III, as described in the Notice of Violation. (50-329/82-22-08; 50-330/82-22-08)

- b. In addition to the above, the inspectors identified other noncompliances associated with the installation of the DG muffler as follows:

- (1) To allow for adequate thermal expansion of the DG mufflers, slots were specified by Drawing M18-80-4 to be sized at 7/8" by 1 5/8". In addition, Bechtel Vendor Drawing M18-425(5)-1 required that plate slots used for support plate modifications be machined.

The inspectors determined that the slots were irregular and did not conform to design drawings. Slot surfaces appeared rough and discolored, indicating they were torch cut rather than machined as required by design drawings.

Failure to fabricate the slots in accordance with design drawings was considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion V, which requires that activities affecting quality be accomplished in accordance with drawings as described in the Notice of Violation. (50-329/82-22-09A; 50-330/82-22-09A)

Subsequent to the inspection, the licensee generated NCR 4693 to disposition the slots of the support plates for the DG muffler.

- (2) Vendor Drawing M18-250-6 required that jacking plates be installed and imbedded in concrete beneath the muffler support jacking screws.

The inspection of the Diesel Generator muffler in Bay No. 1, revealed that the jacking plates had not been installed beneath the center saddle support. The licensee identified that nine of the 48 jacking plates were missing in the four bays.

Failure to install the jacking plates was considered an item of noncompliance with 10 CFR Appendix B, Criterion V, which requires that activities affecting quality be accomplished in accordance with drawings as described in the Notice of Violation. (50-329/82-22-09B; 50-330/82-22-09B)

Subsequent to the inspection, the licensee wrote NCR 4694 against the failure to install the jacking plates.

- (3) Drawing M18-250-6 indicated two slide bearing elements welded to the bottom of the outer saddle support base plates for each DG muffler to allow for thermal expansion during muffler heatup. During the plate inspection, it was noted that some of the bearing plates were warped sufficiently to allow dirt to penetrate between the bearing plate surfaces which would restrict plate movement.

A review of all bearing plates by the licensee revealed five of sixteen that were sufficiently warped to allow the inclusion of dirt. Failure of the licensee to protect the bearing surfaces from dirt, dust, and other forms of contamination was considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion XIII requiring control of cleaning and preservation of material and equipment as described in the Notice of Violation. (50-329/82-22-10; 50-330/82-22-10)

On December 3, 1982, the licensee verbally committed to implementing a program to identify other material and equipment requiring protection from contamination and to include this identified equipment in a preventive maintenance program.

#### 8. Diesel Generator Exhaust Piping Hangers

- a. The inspector selected the diesel generator exhaust piping for review. The latest revisions of applicable design drawings were compared to the actual as-built configuration of the hangers.

From this review, it was determined that the actual configuration of the hangers did not match the design drawings for the following hangers:

- (1) 652-1-19; the west support plate was welded to the wall embed on the east side instead of two expansion anchors as illustrated on the redline drawing. The licensee subsequently documented this on FCR M6925 instead of an NCR as required by site procedures.
- (2) 652-1-510; the welds connecting the hanger base plates to the support tubes were not constructed as shown on the drawings. The licensee stated that welding on the hanger was not completed.

The licensee's position was that the hangers in question were non-"Q" and their failure would not affect any safety system. The inspector determined that the exhaust pipe was "Q", as documented in the FSAR, the SER and on Drawing M-652, 3h.1, Revision 8, Note No. 19. Therefore, the hangers supporting the pipe were also required to be "Q".

The exhaust pipe hangers were constructed without implementing the QA Program requirements. The failure of the licensee to ensure that quality assurance requirements defined in the FSAR and the SER were translated into the design and construction of the exhaust system hangers was contrary to 10 CFR 50, Appendix B, Criterion III as described in the Notice of Violation. (50-329/82-22-11; 50-330/82-22-11)

On October 19, 1982, the licensee informed the inspector that the exhaust system was indeed "Q" and administrative measures were under way to correct the problem; however, these measures were not identified on any document. Site Procedure G3.2 required that an NCR be written for nonconforming conditions. The licensee, as of November 10, 1982, had failed to document this nonconforming condition through issuance of an NCR. The failure to control components which did not conform to requirements was contrary to 10 CFR 50, Appendix B, Criterion XV as described in the Notice of Violation. (50-329/82-22-12A; 50-330/82-22-12A)

- b. During the review of the as-built hanger details, the inspector observed the welding of hanger stiffeners to existing "Q" structural steel. The stiffeners were being welded to a 36 inch "Q" beam with 1 1/8" flanges without any preheat. The room temperature at the time of the inspection approximated the outside temperature due to no available heating. The welders informed the inspector that there were no preheat requirements for these welds. The inspector determined that Specification FSW Structural-1 and the AWS 1974 Code require a minimum preheat temperature of 70°F. The licensee did not verify the temperature of the existing structural steel during welding. Furthermore, site inspection procedures were inadequate in that they did not require verification of preheat temperatures until they reach 150°F. The failure to verify 70°F preheat temperature requirements was contrary to 10 CFR 50, Appendix B, Criterion IX as described in the Notice of Violation. (50-329/82-22-13; 50-330/82-22-13)

9. Diesel Generator Building Monorail

A review of the monorail installed above each diesel generator was performed in order to determine whether the monorail was designed and installed in compliance with the requirements in the FSAR and construction specifications.

The licensee took exception to Regulatory Guide 1.29, Position C.4, resulting in these monorails not being constructed "Q". The licensee's plant wide exception to position C-4 of RG 1.29 has been referred to NRR for review. This item is unresolved pending NRR's response (50-329/82-22-14; 50-330/82-22-14).

Discussions with the licensee on the monorail indicated that not only was the monorail installed non-"Q", but it also was not analyzed to Seismic Category I requirements as required by RG 1.29. The failure to analyze the monorails to Seismic Category I requirements was contrary to 10 CFR 50, Appendix B, Criterion III as described in the Notice of Violation. (50-329/82-22-15A; 50-330/82-22-15A)

Subsequent to the inspector's finding, the licensee reported the nonconforming design on a "Proximity-Seismic Category II/I Interaction Identification Sheet" instead of a Nonconformance Report. The identification of this nonconforming item in this manner circumvented the licensee's nonconformance program. As a result, this concern had not been reviewed for generic applicability or for potential reportability as of November 10, 1982. The failure to identify and control this nonconforming condition was contrary to 10 CFR 50, Appendix B, Criterion XV as described in the Notice of Violation. (50-329/82-22-12B; 50-330/82-22-12B)

10. Diesel Generator Building HVAC Fan Support Steel

- a. An inspection of the as-built structure was made using the latest revisions of applicable design drawings. From this review, the inspector determined the following discrepancies:
- (1) The eight bracing top gusset plates identified on Drawing C-1004, Revision 10, as 5/16" thick were measured by the inspectors to be 1/4" thick in all four DG bays.
  - (2) The as-built gusset plate connections in Bay No. 1 were not built as identified on Detail 3 of Drawing C-1004. The braces were welded together as opposed to separate welds for each brace.
  - (3) None of the sixteen 1/4" bracing angles identified on Drawing C-1004 were constructed utilizing 1/4" material.
  - (4) Drawing C-1004, Detail No. 2 required the W10 beam to beam connection to be welded. In Bay No. 3, the inspector observed that a bolted connection was constructed in lieu of the required welded connection.

- (5) The column cover plate identified on FCR-C4401 was not constructed in Bay No. 3 as required. The plate was slotted instead of solid as depicted on the FCR.

The failure of the licensee to ensure that work was accomplished in accordance with the drawings was an item of noncompliance with 10 CFR 50, Appendix B, Criterion V as described in the Notice of Violation. (50-329/82-22-16; 50-330/82-22-16)

The inspector further determined that QCIR C210-172, Revision 1, which documented the inspection of the fan supports, was closed on July 1, 1981 with no exceptions or nonconformances noted. The QC inspector closed the inspection with a determination that the structure was built in accordance with the drawing. The failure of QC to detect and identify these nonconformances was contrary to 10 CFR 50, Appendix B, Criterion X as described in the Notice of Violation. (50-329/82-22-17; 50-330/82-22-17)

- b. The inspector determined that Procedure FID-2.100, "Outstanding FCR/FCN Retirement," Revision 2, was inadequate in that it did not require, for retired FCR/FCN's, that the design drawing remain annotated indicating that an FCR/FCN had been retired. As a result, the HVAC structural steel did not conform to identified design requirements. Additionally, as a result of not having adequate measures to control retired FCR/FCN's, the document control vault lost retired FCR C-2103. The failure of the licensee to establish measures to identify the existence of retired FCR/FCNs on the appropriate design drawings was an item of noncompliance with 10 CFR 50, Appendix B, Criterion V as described in the Notice of Violation. (50-329/82-22-18A; 50-330/82-22-18A)
- c. The inspector questioned the licensee as to the method in which the bottom bracing connections were made since there were no bottom bracing gusset plate connection details (weld sizes, plate sizes and plate thicknesses) identified on Drawings C-1004 and C-147. There were also no instructions on site to indicate the method or standard practice to be used to design bracing gusset plates. The following concerns were identified:
- (1) Design Drawing C-147 required bolted bracing connections for the diesel generator building HVAC bracing gusset plates. Contrary to this design requirement, Field Sketch CY-1035 was used to design welded connections in lieu of the specified bolted connection. As a result, design changes were being implemented without the same review and approval as the original design. The implementation of changes in design in the field without subsequent review and approval was considered an item of noncompliance with 10 CFR 50, Appendix B, Criterion III as described in the Notice of Violation. (50-329/82-22-15B; 50-330/82-22-15B)

- (2) Field Sketch Number CY-1035 which illustrated the bottom gusset plates was not annotated as "Q", nor was there a reference on the sketch to the affected design drawing. This is contrary to the requirements delineated in Procedure FPD-5.000, "Preparation of Field Sketches," Revision 1. The failure to follow procedures was an item of noncompliance with 10 CFR 50, Appendix B, Criterion V as described in the Notice of Violation. (50-329/82-22-18B; 50-330/82-22-18B)
  - (3) The inspector further determined that the procedure did not require the drawing to be annotated with a reference to the field sketches. There was no procedural requirement or means to ensure that the existence of a field sketch was annotated on a drawing. The failure to develop procedures to adequately control field sketches was in noncompliance with 10 CFR, Appendix B, Criterion V, as described in the Notice of Violation. (50-329/82-22-18C; 50-330/82-22-18C)
  - (4) The inspector determined that the bottom gusset plate sizes were only identified on a Combo Shop work order sketch. As a result, the bottom gusset plates were designed in the field without adequate review and approval. The failure to control the gusset plate design was in noncompliance with 10 CFR 50, Appendix B, Criterion III as identified in the Notice of Violation. (50-329/82-22-15C; 50-330/82-22-15C).
- d. The inspectors determined that the existing 1/4" gusset plates appeared to be out of ASTM Specification A6 requirements for rolling mill tolerances as identified in Table 1 of the ASTM Specification. Due to the plates having been previously painted, the actual plate thicknesses had not been determined at the time of this inspection. This matter is unresolved (50-329/82-22-19; 50-330/82-22-19).

#### 11. Pipe Installation Activities

The inspector selected for inspection one of the two pipelines which connected an air start tank to Diesel 1B11, and the four support hangers for both pipelines. Diesel 1B11 was located in Bay 2.

Pipeline 1-GCC-1-S-652-2 was specified on Bechtel Drawing No. M-652, Sheet 2, (Q), Revision 3. The drawing specified the pipeline configuration and identified which welds (shop welds) were made at the vendor and which welds (field welds) were made by site craftsmen.

The inspector observed the installed pipeline components and connecting welds for line 1-GCC-1-S-652-2. The pipeline configuration was as specified on the drawing. There were no unacceptable visual deficiencies on any of the pipe welds. The pipe components supplied by the vendor were marked with heat number 32995. The pipe component (pup piece) supplied at the site was marked with heat number 738367. Certified Material Test Reports, CMTR's, were available on site for both of the above heat numbers.

A review of the weld inspection records for the shop welds revealed that the shop welds had passed radiographic and visual examination. The visual examination report included fitup, root, intermediate and final weld passes.

A review of the records for two field welds (M-652-2-7 and M-652-2-11) indicated that only final visual examination had been performed. The licensee stated that no additional nondestructive examination, NDE, was required for those field welds because the pipe was only three inches in diameter. ASME, Section III, 1971 Code, Summer 1973 Addendum, Article ND-5220 states, "All pressure-retaining welds in piping, pumps and valves greater than four inches nominal pipe size shall be examined by either the magnetic particle, liquid penetrant or radiographic method." This code revision did not specify any NDE requirements for piping diameters of four inches and less. The pipe inspected was less than four inches in diameter.

A review of the Midland Final Safety Analysis Report, FSAR, Section 3.0, revealed that the design code (ASME) for nuclear pipe over two inches in diameter, had not been specified. During a telephone conversation on November 18, 1982, the licensee concurred that the design code had not been specified in the FSAR, but stated the design code was specified in site Specification No. M-324(Q), Revision 1. The RIII inspector confirmed the licensee's statement. This matter has been referred to NRR and is open pending further review (50-329/82-22-20; 50-330/82-22-20).

#### 12. Hanger Design Control

An inspection of four support hangers on Diesel 1G11 pipelines was conducted. The inspector requested the Bechtel Site Document Control Center to provide the latest isometric drawings for the four hangers that supported the two diesel air start pipelines. The control center provided the following drawings:

- (1) 1-652-2-25(Q), Revision 0
- (2) 1-652-2-26(Q), Revision 1F1
- (3) 1-652-2-27(Q), Revision 0
- (4) 1-652-2-28(Q), Revision 1F1

Drawing 1-652-2-25(Q), Revision 0, was used to check the actual installation of the respective hanger. The drawing and the actual installation were different. A review of the QC copy and the original work print revealed that the hangers appeared to be installed in accordance with the red line changes.

Field Instruction FIP-1.112 Revision 5, "Field Marking of Prints for Pipe Supports," was used to control red line changes. The procedure essentially defined the method for which support changes that did not require a total redesign could be modified in the field. The procedure

required Resident Engineering approval for all support modification except minor revisions that did not affect the basic design. The procedure appeared to assign Field Engineering the responsibility of controlling (ensuring proper approvals and distribution) red line changes. The procedure also required Field Engineering to number and log the red line changes. Discussions with Field Engineering personnel responsible for the red line log revealed that the log was not controlled. The log appeared to be an ineffective control mechanism because the entries were made chronologically for changes to all drawings and could not readily be used to identify how many changes affected any specific drawing.

The Bechtel Lead Mechanical Field Engineer stated that red line changes were initiated by Field Engineering, approved by Resident Engineering, and returned to Field Engineering for distribution. In addition, the inspector determined that distribution to the Document Control Center was being bypassed.

Adequate measures were not established to control the issuance of these document changes. This was contrary to 10 CFR 50, Appendix B, Criterion VI as described in the Notice of Violation. (50-329/82-22-21; 50-330/82-22-21)

Bechtel Project Engineering Procedure, PEP, No. 4.46.9, Revision 0, established the controls for red line changes received by Resident Engineering. The procedure required the cognizant discipline resident engineer to maintain a log of red lines received. The inspector verified that two red lines identified on isometric drawing 1-652-2-25(Q) were properly controlled by the log.

### 13. Hanger Installation Activities

The inspector checked the installation of four support hangers against the respective isometric drawings (including changes) and the installation criteria.

The four hanger configurations appeared to be as specified on the latest revisions to the isometric drawings. The welders identification mark was stamped adjacent to all hanger welds.

All (approximately ten) of the field welds on the two large hangers specified on Drawings 1-652-2-26(Q), Revision 1/F1, and 1-652-2-28(Q), Revision 1/F1, were covered with surface rust. Specification 7220-M-326(Q), Revision 8, paragraph 5.15.1 stated, in part, "All component pipe supports shall have surface preparation and primer applied in accordance with Specification 7220-A-41, Technical Specification for Field Priming and/or Top Coating Steel Surface . . ." Specification 7220-A-41, Revision 9, paragraph 4.2 stated that all protective coating of steel for outside the containment shall be non-"Q". The licensee stated that non-"Q" meant non-safety related and therefore, was not required to maintain the safe operation of the plant.

On November 9, 1982, the Bechtel Resident Engineer stated the cognizant corporate (Ann Arbor, Michigan) engineer's evaluation of the steel surfaces (welds) outside containment concluded that the surface rust would not exceed 20 mils (0.02 inches) deep; that no pitting would result; and that even with the smallest weld (1/8 inch) there would only be a 16 percent reduction of weld size, which would still leave a 2.8 safety margin with maximum corrosion over a 40 year period. Additionally, the site construction personnel provided an established schedule which should assure that the welds were painted before the plant operates. No items of noncompliance or deviations were identified.

14. Hanger Material Traceability

- a. Hanger parts, specified on Drawings 1-652-2-26(Q) Revision 1F1 and 1-652-2-28(Q), Revision 1F1, included 1/2" x 6" x 6" and 1/2" x 4" x 4" tube steel (ASTM A-500, Grade B). The installed tube steel was not marked with heat numbers. The inspection records did not identify the heat numbers traceable to the installed tube steel. The installed tube steel had the letter "Q" stamped on the individual sections. The licensee stated that the letter "Q" indicated that the tube steel heat numbers were controlled by procedure up to the time the hangers were fabricated. The licensee also stated that the site procedures did not require any additional traceability controls after fabrication.

The FSAR, Table 3.2-4 states that the design and fabrication code for hangers and supports for nuclear piping is ASME Section III, Subsection NF, 1974 (no addendum). Subsection NF-4122 states that material for component supports shall carry identification markings which will remain distinguishable until the component support is fabricated or installed. Therefore, the site controls for material identification for hangers (component supports) appeared to comply with the ASME code requirements.

- b. The inspector reviewed the Hanger Material Log for structural tubing. The log identified the quantity (in feet), size, material type (grade), ASME class, heat number, material receipt number, purchase order number, and relative remarks for the various shipments of tube steel. The log revealed that only type ASTM A-500 Grade B material had been received. The log also revealed that at least 3600 feet of various sizes and lengths of tube steel had been addressed on Bechtel Nonconformance Report, NCR 3266, January 23, 1981. The NCR stated that the "material was procured from subvendors who were not ASME or Bechtel qualified for an NA 3700 quality program at the time of purchase." The NCR stated that no hold tags were applied. The NCR listed 122 steel items (including various qualities, sizes and lengths of tube steel, angle iron, plate, etc.) which had been purchased from 16 different material suppliers/manufacturers. Page 8 of the NCR stated "A conditional release is granted for use of the subject material. The material is traceable to a heat number and corrections or removal can be accomplished without causing damage

or contamination to associated plant equipment or structure." The conditional release was dated February 5, 1981. The conditional release was revised (added page 9 to the NCR) on March 25, 1981 to restrict 37 of the 122 items from use in ASME Section III Class 1 pipe supports. The restricted material was permitted for use in Class 2 and Class 3 hangers. On June 16, 1981, the NCR was revised to apparently reject the above 37 items for Class 1 use again. On July 4, 1981, the NCR was revised to reject 15 other items from installation in Class 1 systems. On July 17, 1981 (amended July 27, 1981) the NCR was revised to accept 42 of the remaining items based on approval of two of the 16 material suppliers, and revised to reject seven additional items from Class 1 use.

On October 28, 1981, the NCR was revised to reject one additional item from Class 1 use. Thus, from the date (January 23, 1981) that NCR 3266 was written, the NCR was revised four times to add restrictions on the use in Class 1 systems of numerous materials.

The Bechtel QC acceptance (page 15) of NCR 3266 stated the resolutions of the 122 items, along with a brief basis for the resolutions. The resolutions were addressed in three categories according to the bases. The bases for the three categories was as follows:

- (1) Certified Material Test Reports, CMTR's, were on file for 19 items and the requirements of ASME Subsection NF-2610(c) had been met, therefore, the respective materials could be used in Class 1 systems.
- (2) CMTR's were on file for 42 items and the requirements of ASME Subsection NA-3700 had been met, therefore, the respective materials could be used in Class 1 systems.
- (3) CMTR's were on file for 61 items and the requirements of ASME Subsection NF-2610(b) had been met; therefore, the respective materials could be used in Class 2 and Class 3 systems. The NCR noted that measures had been taken (heat log changed) to prevent the 61 items from being used in Class 1 systems on July 28, 1982.

Paragraphs (a), (b), and (c) of the ASME Code Section III, Subsection NF-2610 1974 Edition, Summer Addenda 1976 states:

(a) Except as provided in (b) below. Material Manufacturers and Material Suppliers shall have a Quality System Program or an Identification and Verification Program, as applicable, which meets the requirements of NA-3700.

(b) The requirements of NA-3767.4 shall be met as required by NF-2130. The other requirements of NA-3700 need not be used by Material Manufacturers or Material Suppliers for small products, as defined in (c) below, and for material which is allowed by this Section to be furnished with a Certificate of Compliance. For

these products, the Manufacturer's or Installer's Quality Assurance Program (NA 4000) shall include measures to provide assurance that the material is furnished in accordance with the material specification, and the special requirements of this Section.

(c) For the purpose of this paragraph, small products are defined as given in (1) through (3) below:

- (1) pipe, tube, pipe fittings, and flanges of 2 inch nominal size and less
- (2) bolting material including studs, nuts, and bolts of 2 inch nominal diameter and less
- (3) structural material with a nominal cross-sectional area of 2 sq. inches and less.

Subsection NF-2130 states:

(a) All materials used in the construction of component supports shall be certified. Certified Material Test Reports in accordance with NA-3767.4 shall be provided for material in Class 1 plate and shell supports, Class 1 linear supports, and for materials for other types and classes of component supports when impact testing is required (NF-2311).

(b) Certificates of Compliance with the material specification, grade, class, and heat-treated condition, as applicable, may be provided in lieu of Certified Material Test Reports for materials for all other component supports.

(c) Copies of all Certified Test Reports and Certificates of Compliance applicable to each material used in the component support shall be furnished with the material."

The Bechtel QA Manual (ASME III), Revision 2, dated July 1980, paragraph 4322 states, in part "Quality program demonstration is established through possession of a valid current, ASME Quality System Certificate (Material) or survey of the manufacturer or supplier or other (Bechtel) Procurement Supplier Quality Department."

Based on the ASME Subsection NF-2610, the first and third resolution categories to NCR 3266 appeared to be inadequate in that the NCR did not indicate that measures had been taken at the respective suppliers and/or manufacturer, or the installer (Bechtel) to provide assurance that the material was furnished in accordance with the material specification. The measures were required to verify the validity of the suppliers' certificates and the effectiveness of the certification system. Note: Subsection NF-2610(c) which was addressed in the first resolution category, defines small products and does not delete the requirements of Subsection NF-2610(b).

During a telephone conversation on November 29, 1982, the licensee stated that two (i.e., Mills Alloy Steel Company and Carbon Steel Products Corporation) of sixteen of the material suppliers/manufacturers were actually suppliers. The other fourteen were manufacturers contracted by the two suppliers. The licensee also stated that Bechtel had in fact approved the two suppliers QA programs prior to issuing contracts and that Bechtel had verified that at least one of the two suppliers had sufficient controls to ensure that their subcontractors (i.e., the fourteen manufacturers) had acceptable QA programs.

On December 7, 1982, the inspector received from the licensee copies of a Bechtel Supplier Survey of Mills Alloy Steel Company dated June 10, 1981; copies of two ASME Quality System Certificate (Materials) for Mills Alloy Steel Company; copies of two Bechtel Reports of Audit of Carbon Steel Products Corporation dated June 19-20, 1979 and June 3, 1980 respectively; and one copy of a Bechtel Corrective Action Report (Re-audit) of Carbon Steel Products dated July 30, 1979. The above documents indicated that Mills Alloy Steel Company was an approved material supplier and adequately capable of qualifying their material manufacturers during the effective period of the respective purchase contracts which were addressed on NCR 3266. The above documents indicated that Carbon Steel Products Corporation was an approved material supplier during the effective period of the respective purchase contracts which were addressed on NCR 3266. No documentation was received which indicated that the material manufacturers, contracted by Carbon Steel Products Corporation, possessed an ASME Quality System Certificate (Materials) or were surveyed by the Bechtel Procurement Supplier Quality Department. The Certificate or survey was required by the Bechtel QA Manual (ASME III), revision 2, paragraph 4322, to demonstrate that the manufacturers had an adequate quality program. The licensee was notified of this inadequacy during a telephone conversation on December 9, 1982. This matter is unresolved pending review of additional documentation which may be supplied by the licensee (50-329/82-22-22; 50-330/82-22-22).

The measures taken in the third category to prevent the items restricted to Class 2 and Class 3 systems from being used in Class 1 systems was inadequate. These measures only controlled the restricted items after July 28, 1982. Nothing was done to verify whether or not restricted items had been used in Class 1 systems prior to July 28, 1982. This verification was necessary, especially since the NCR permitted unrestricted uses based on the conditional releases specified prior to July 28, 1982. The basis for the conditional releases stated that, "corrections or removal (of nonconforming material) can be accomplished . . ." Measures were not established or implemented to determine if Class 2 and Class 3 materials were used in Class 1 systems. Failure to establish measures to control materials which did not conform to requirements and to prevent their inadvertent use or installation in Class 1 systems was contrary to 10 CFR 50, Appendix B, Criterion XV as described in the Notice of Violation. (50-329/82-22-23; 50-330/82-22-23)

The second resolution category to NCR 3266 appeared to be adequate in that the applicable code requirements were indicated as being fulfilled.

15. Hanger Weld Inspections

QCIR No. 7220/P-2.10, Revision 9, the hanger inspection record, did not indicate whether or not any in-process weld inspections had been performed during the installation of hangers (pipe supports). The licensee provided Bechtel Quality Control Instruction No. 7220/W-1.60, Revision 2. The scope of the instruction stated that the instruction provided the quality control verification of in-process inspection activities that were necessary to ensure that specified welding process requirements were being achieved. The instruction distinguished between the civil, electrical, component support, and piping (ASME) weld activities. The instruction and/or the instruction supplement required the following in-process inspection of weld activities:

- a. Fitup
- b. Tack welds
- c. Surface Preparation
- d. Preheat
- e. Welding Technique
- f. Interpass Temperatures and Cleaning
- g. Welder Qualification
- h. Weld Procedure (addressed in W-1.60 supplements)
- i. Established the frequency and number of weld activities required to be observed.

With the exception of preheat verification, the instruction appeared to establish suitable controls for the above in-process weld activities. Most of the controls for preheat verification were defined in instructions PQCI CW-1.00, Revision 2, E-2.10, Revision 6, E-1.0, Revision 11, P-2.10, Revision 10, and PW-1.00, Revision 4 for the respective discipline activities (i.e., civil, electrical, component supports, and pipe welding). Inclusive, the PQCI's required verification of preheat requirements in excess of 70°F for all weld activities and verification on a defined sample basis for preheat requirements of 70°F and less. As discussed in Section 8.b of this report, an inadequacy was identified with the preheat controls for civil (structural) welding.

16. Anchoring of Hangers

The hangers identified on Isometric Drawings 1-652-2-26(Q), Revision 1/F1 and 1-652-2-28(Q), Revision 1/F1 were attached to the concrete superstructure with grouted anchor bolts. The nuts on the bolts were not secured. The inspector requested the design requirements for securing anchor bolts. The licensee provided Specification 7220-C-306(Q),

Revision 8, Paragraph 5.8. Paragraph 5.8 appeared to establish adequate methods for securing threaded connections. PQCI No. P-2.00, Revision 6 appeared to establish sufficient controls during inspections to assure that the anchor bolts would be secured.

The type (grade) of bolting materials (including alternatives), was specified in Specification 7220-C-306(Q), Revision 8, Paragraph 5.C. The diameter of the anchor bolts was specified on the isometric drawings. Based on the anchor diameter, the bolt embedment could be determined from Specification 7220-C-306(Q), Revision 8, Appendix B, Table B-2. Since the bolts had already been grouted into place, the inspector reviewed the records (QCIRs) for inspection of grouting and dry packing. The records indicated that the bolting type and size had been properly verified.

The inspector reviewed and discussed with the site Resident Engineering Group, the design calculations for the anchor bolt diameters specified on Isometric Drawing 1-652-2-26(Q), Revision 1/F1. The calculations indicated that the combined stresses for shear and tensile for the specific hanger required a bolt diameter of 7/8 inch when using ASTM Grade A-36 steel. The Resident Engineering group stated that the calculation sheet concluded by specifying a diameter of 3/4 inch. The Resident Engineer stated that this error would be corrected. The ultimate result was that the correct size bolt (7/8 inch) was actually specified on the drawing.

17. Concrete Chipping

The inspector observed a section of concrete wall which had been chipped away. The chipped section was located on a wall in Containment Purge Room 702, elevation 674' 6". The volume of chipped concrete was non-uniform and approximately 18 inches high, 10 inches wide and 4 inches deep (in some places). There were no markings or tags in the area which would have indicated that the chipped section was controlled.

A Bechtel Field Engineer was responsible for that area of the plant and was aware of the chipped section. The engineer also stated that he planned to put this concern on a punchlist for regrouting.

The licensee stated that the concrete was chipped away in late 1981 to locate drain tubes for tendon sheaths which were inadvertently embedded in the wall. The inspector observed two drains located just above the chipped area.

The inspector asked if measures had been established to control the chipped area since the wall was now in a nonconforming condition. The licensee provided Bechtel Field Instruction No. FIG-1.111, Revision 4, Concrete Drilling Permit. Section 2.0 of this instruction stated, "This instruction discusses the method of initiating, identifying, approving, and controlling concrete drill permits . . ." Section 5.0 stated, "This instruction applies to all concrete drill permits issued by any discipline for core drilling, chipping of concrete, or drilling for

installation of concrete anchors." The instruction defined the administrative process for completing concrete drilling permits. The instruction appeared to address a method of control which could be used for concrete chipping activities, such as the one in the containment purge room. However, the instruction did not establish requirements which stated when or for what activities a drilling permit must be used. A drilling permit was not used to control the chipped concrete in the containment purge room. Therefore, measures were not established to provide controls over concrete chipping activities which affected the quality of structures. The Bechtel construction personnel stated that there were several other areas in the plant in which the concrete had been chipped and was not controlled. Failure of the licensee to provide controls over activities such as concrete chipping which affects the quality of structures was contrary to 10 CFR 50, Appendix B, Criterion V as described in the Notice of Violation. (50-329/82-22-24; 50-330/82-22-24)

As a result of this finding, the licensee wrote NCR No. MO1-9-2-154 November 14, 1982.

18. Cable Segregation

In Containment Purge Room 702, the inspector observed cable tray sections which contained metal dividers that extended approximately 20 feet along the trays. The dividers were approximately the height of the tray sides. The tray sections were identified with green alpha-numeric markings (i.e., 1BTF01, 1BTF02 and 1BTF03; 1BJS01, 1BJQ02, and 1BJQ03). The RIII inspector noted that many of the included cables crossed over the dividers or in some cases were stacked higher than the dividers. The purpose of the dividers was to provide a barrier between low voltage control cables and instrument cables.

The barrier/divider was designed to eliminate the possibility of the electromotive forces of the control cables from inducing noise signals into instrument cables. Since the cables crossed over the divider/barrier and were stacked higher than the divider, the cables were therefore misrouted and rendered the barrier ineffective.

PQCI No. E-3.0, Revision 5, Final Area Completion Activities of Electrical Installation, addressed verification of certain cable training (i.e., bundling and redundant channel separation), but did not address verification of cable segregation in horizontal tray runs. Failure to establish a program for inspection of cables installed in horizontal trays which use metal dividers, to ensure conformance with design requirements for cable segregation was contrary to 10 CFR 50, Appendix B, Criterion X as described in the Notice of Violation. (50-329/82-22-25; 50-330/82-22-25).

As a result of this finding, the licensee wrote NCR No. MO1-9-2-151 dated November 1, 1982 to correct the specific cable tray installations addressed above.

19. Nonconforming Welds in Structural Steel

During the reporting period, the Resident Inspector was aware that the licensee had overinspected 78 structural beams and that 41 of those beams had nonconforming welds. More definitively stated, 66 weld joints of 146 overinspected were nonconforming. As a result of this overinspection and subsequent findings, Nonconformance Report (NCR) No. M01-9-2-074 was generated. Weld defects noted were undersized welds and undercut welds ranging from 1/16 to 1/8 inch.

Because of the indeterminant state of a large number of beams (nominally 2400 beams), the licensee has generated a Safety Concern and Reportability Evaluation Request to determine the reportability and ultimate safety significance of their findings. This evaluation was intended to be completed by mid-December 1982. The Resident Inspector examined some of the nonconforming welds identified in the NCR and concurred with the findings. This concern was being reviewed and controlled by the licensee's programs.

20. Ultrasonic Testing (UT) of Holddown Bolts

During the reporting period, the Resident Inspectors and a Regional based NDE Inspector measured anchor bolts in the four battery charger rooms, the Diesel Generator Building and the Service Water Building. Additional measurements using other transducers are proposed in the future to accommodate more evaluation. These evaluations will be documented in other NRC Inspection Reports.

21. Prestartup Test

The inspector observed the initial pump run of Component Cooling Water Pump 2P-73B on 10/21/82. The observations included a review of the test procedure OSP-CCW.01, observation of portions of the actual pump test, and a review of test data to ensure that test objectives had been met.

Prior to the beginning of the test, the inspector walked down portions of the system and held discussions with members of the various test groups required to assimilate test data. The following concerns were noted:

- a. The Vibration Testing Group initially set up on the wrong pump and had to be told the proper pump locations.
- b. Personnel monitoring bearing and oil temperatures were not aware of the maximum temperature limits on the pump being monitored.
- c. Minor discrepancies such as broken valve indicators and small leaks were not documented either on the test summary or on a maintenance form.
- d. Pump performance curve supplied by the manufacturer referenced only one of the four component cooling water pump serial numbers.

An interim exit interview was held on October 26, 1982, with the Technical Superintendent and his staff to discuss the inspector's testing concerns. The Technical Superintendent acknowledged the inspector's findings and stated the concerns would be addressed.

The inspector observed portions of the initial pump run of Decay Heat Removal Pump 2P-60A. The concerns described in the previous paragraph (except for item d which was not applicable for this test) had been satisfactorily resolved for this test. The test was stopped after 90 minutes of pump run time due to high suction differential pressure (DP) indicating a clogged suction strainer. Oil and bearing temperatures had not stabilized adequately to satisfy test acceptance criteria. The strainers were cleaned and replaced and the test restarted. The test was completed satisfactorily on November 13, 1982.

22. Drawing C-45

The following concerns were discussed with the licensee regarding the staff's review of drawing C-45:

- a. The perimeter and baffle dikes adjacent to the Emergency Cooling Water Reservoir (ECWR) were not included as "Q" on the drawing. The licensee subsequently agreed to define these two areas as Q.
- b. The licensee was requested to confirm in writing that no seismic Category I underground utilities extend beyond the "Q" bounds of drawing C-45.
- c. The licensee was also requested to put a note on drawing C-45 indicating that the tunnel under the turbine building was "Q".

The above concerns will be reviewed during subsequent inspections.

23. Auxiliary Building Instruments

While reviewing the baseline readings on the auxiliary building instrumentation, the inspectors observed that the Electrical Penetration Area (EPA) outboard wings appeared to be moving upwards while the remaining deep seated absolute vertical readings were downward. The licensee was requested to provide an explanation of the significance of the Auxiliary Building movements. Two meetings on the subject have already been held on site and future discussions are planned.

The upward movement of the EPA outboard wings appeared to be caused by a decrease in the ambient temperature. The licensee was requested to define the correlation between temperature and upward movement and determine if a correction factor should be incorporated into future EPA instrumentation data.

24. Review of Remedial Soils Requalification Activities

During this inspection the inspector reviewed the results of the written examinations administered to 19 QC inspectors. These written examinations, which tested the inspectors on QC programmatic requirements, were administered as part of the requalification program initiated by the licensee in integrating all QC functions under Consumers Power Company control. Of the 19 inspectors who were administered the examination, two inspectors failed the examination. The inspector informed the licensee that all previous inspections performed by these two inspectors were required to be reinspected. The licensee agreed to perform the reinspection.

No items of noncompliance or deviations were identified.

25. Perimeter Dike Armor Stone

During a plant tour the inspectors noted that the licensee was replacing riprap protection for the eastern perimeter dike. The inspectors determined that the new armor stone appeared to have weak clay-shale seams in most of the pieces. This was confirmed by dropping a few pieces and observing them break apart. The licensee was informed of the inspector's concerns.

Subsequently, the inspector was informed by the licensee that the rock did not meet the freeze-thaw and gradation requirements of Specification C-209. The inspector was informed that the nonconforming armor stone would be removed from the site.

The requirement that the perimeter and baffle dikes adjacent to the ultimate heat sink be covered by the QA plan is delineated in the May 25, 1982, NRC to licensee letter and in Section 2.5.6.1 of the SER. The inspectors determined that the licensee had purchased the armor stone without establishing controls over the procurement and installation. The failure to translate applicable regulatory requirements into design documents was considered to be in noncompliance with 10 CFR 50, Appendix B, Criterion III as described in the Notice of Violation. (50-329/82-22-26; 50-330/82-22-26)

Subsequent to the inspectors' identification of the matter, the licensee agreed to have all necessary "Q" controls in place before proceeding with additional armor stone placement.

26. Site Tours

At periodic intervals during the report period, tours of essentially all site areas were performed. These tours were intended to assess the cleanliness of the site; storage conditions of equipment and piping being used in site construction; the potential for fire or other hazards which might have a deleterious effect on personnel and equipment; and to witness construction activities in progress. A system walkdown was performed of portions of the Diesel Generator and Primary Makeup System.

27. Independent Assessment of Auxiliary Building Underpinning

The inspectors reviewed the weekly reports (attached) submitted by Stone and Webster Engineering Corporation to document the results of the independent assessment of Auxiliary Building underpinning activities. No significant concerns were identified in these reports.

28. Open Items

Open items are matters not otherwise categorized in the report that require followup during future inspections. Open items disclosed during this inspection are discussed in Section 4.d and 11.

29. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items or items of non-compliance. Unresolved items disclosed during this inspection are discussed in Sections 5, 6.c, 6.d, 9, 10.d, and 14.b.

30. Exit Interview

The inspectors met with licensee representatives (denoted under Persons Contacted) on October 15, 22, 26, 28, November 10 and 23, 1982. The inspectors summarized the scope and findings of the inspection. The licensee acknowledged the information.

31. Enforcement Conference

On January 18, 1983, an enforcement conference was held in the Region III Glen Ellyn office between Messrs. James G. Keppler, A. B. Davis, members of the Region III Midland Section, Mr. J. H. Sniezek of IE, and Messrs. J. Selby, J. Cook and others of the licensee's staff. The purpose of the conference was to discuss the results of the special team inspection of the Diesel Generator Building.

Based on the licensee's comments regarding the IPIN issue, members of the Midland Section subsequently interviewed thirteen QC inspectors to determine the standard practice used by QC inspectors in closing open Inspection Reports which had open IPIN's. The results of these interviews are discussed in Section 5.c of this report.